1988

URI Undergraduate Course Catalog 1988-1989

University of Rhode Island

1988-89 Bulletin of
The University of Rhode Island
Undergraduate Studies

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Contents

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1988-89 Calendar

First Semester

August 22–September 10
Registration period, College of Continuing Education (CCE)

September 5, Monday
Holiday, Labor Day

September 6, Tuesday
Kingston campus registration, 8 am–5 pm

September 7, Wednesday
Classes begin, Kingston campus—8 am
University Faculty Meeting, 3:30 pm

September 12, Monday
Classes begin, CCE

September 16, Friday
Final day for students to drop "Early Drop" courses

September 20, Tuesday
Final day for students to add courses and to add P/F grading option
Kingston campus fees will not be adjusted downward for courses dropped after this date

September 21, Wednesday
Final day for undergraduates to drop CCE courses designated "Early Drop"

September 23, Friday
Final day for students to add CCE courses and to add P/F grading option for CCE courses

October 10, Monday
Holiday, Columbus Day

October 12, Wednesday
Final day for undergraduates to drop Kingston campus courses and to change from P/F option to grade

October 17, Monday
Final day for undergraduates to drop CCE courses and to change from P/F option to grade

October 17–21
Preregistration for spring semester, Kingston campus

October 21, Friday
Mid-semester, Kingston campus

October 29, Saturday
Mid-semester, CCE

November 8, Tuesday
Holiday, Election Day

November 11, Friday
Holiday, Veterans' Day

November 17, Thursday
University Faculty Meeting, 3:30 pm

November 23, Wednesday
Thanksgiving recess begins, 10 pm

November 28, Monday
Classes resume, 8 am

December 9, Friday
Classes end, Kingston campus

December 10–12, 17–18
Reading days, Kingston campus

December 13–16, 19–20
Final examinations, Kingston campus

December 17, Saturday
CCE classes, examinations end

December 22, Thursday
Final grades due in Registrar's Office, 4 pm

Second Semester

January 2–21
Registration period, College of Continuing Education (CCE)

January 16, Monday
Holiday, Martin Luther King's Birthday

January 17, Tuesday
Orientation and academic advising for new students

January 18, Wednesday
Kingston campus registration, 8 am–5 pm

January 19, Thursday
Classes begin, Kingston campus–8 am

January 23, Monday
Classes begin, CCE

January 25, Wednesday
University Faculty Meeting, 3:30 pm

January 30, Monday
Final day for students to drop "Early Drop" courses

February 1, Wednesday
Final day for students to add courses and to add P/F grading option
Fees will not be adjusted downward for courses dropped after this date
Final day for CCE students to drop "Early Drop" courses

February 3, Friday
Final day for CCE students to add courses and to add P/F grading option

February 20, Monday
Holiday, Washington's Birthday

February 23, Thursday
Final day for students to drop courses and change from P/F option to grade

February 27, Monday
Final day for CCE students to drop courses and to change from P/F option to grade

March 8, Wednesday
Mid-semester, Kingston campus

March 10, Friday
Mid-semester, CCE

March 13, Monday
Spring recess begins, 8 am

March 20, Monday
Classes resume, 8 am

March 27–31
Preregistration for fall semester, Kingston campus only

May 2, Tuesday
University Faculty Meeting, 3:30 pm

May 3, Wednesday
Classes end, Kingston campus

May 4, 6–7
Reading days, Kingston campus

May 5, 8–12
Final examinations, Kingston campus

May 13, Saturday
CCE classes, examinations end

May 15, Monday
Final grades due in Registrar's Office, 4 pm

May 28, Sunday
Commencement

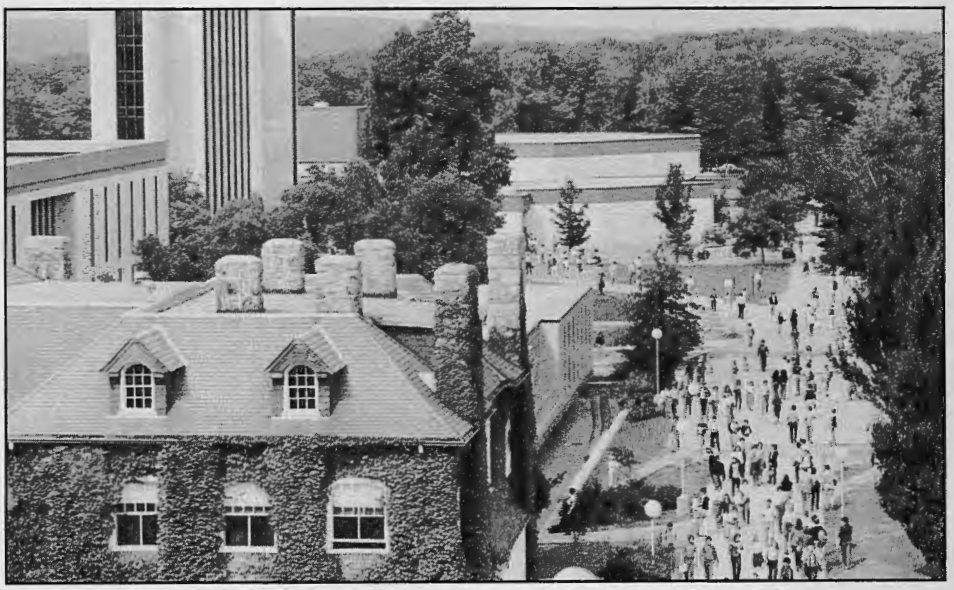
Summer Session 1989

June 12–July 14
First five-week session

July 17–August 18
Second five-week session

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

The University



The 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. As a land-grant college since its founding in 1892, it emphasizes preparation for earning a living and for responsible citizenship, carries on research, and takes its expertise to the community in extension programs.

The University enrolls about 12,000 students on its Kingston campus and another 3,000 in credit courses throughout the state. About half of the 12,000 undergraduates are resident students; there are about 2,600 graduate students, and a full-time teaching faculty of about 750.

The Campus. The University has a spacious country 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 other 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 the Narragansett Bay, is the site of the Graduate School of Oceanography. The College of Continuing Education has a building in downtown 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 had its beginning in the state agricultural school chartered 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, the income from which 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 name land-grant applied to the national system of state colleges and, 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 act of the General Assembly. The Board of Governors for Higher Education appointed by the governor became the governing body for the University in 1981. A historical outline may 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 Programs and Requirements).

Undergraduate students may earn the following degrees:

Bachelor of Arts
Bachelor of Science
Bachelor of Fine Arts
Bachelor of Landscape Architecture
Bachelor of Music
Associate in Science in dental hygiene (two-year program)
Bachelor of General Studies (College of Continuing Education only)

All freshmen who enter the University to earn a bachelor's degree are first enrolled in University College (see page 28). 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.

Undergraduate Degrees

College of Arts and Sciences
Anthropology: B.A.
Art: B.A., B.F.A.
Biology: B.A.
Botany: B.S.
Chemistry: B.A., B.S.
Chemistry and Chemical Oceanography: B.S.
Classical Studies: B.A.
Comparative Literature Studies: B.A.
Computer Science: B.S.
Economics: B.A., B.S.
English: B.A.
French: B.A.
Geology: B.A., B.S.
German: B.A.
History: B.A.
Italian: B.A.
Journalism: B.A.
Latin American Studies: B.A.
Linguistics: B.A.
Marine Affairs: B.A.
Mathematics: B.A., B.S.
Medical Technology: B.S.
Microbiology: B.S.
Music: B.A., B.Mus.
Philosophy: B.A.
Physics: B.A., B.S.
Physics and Physical Oceanography: B.S.
Political Science: B.A.
Psychology: B.A.
Russian: B.A.
Sociology: B.A., B.S.
Spanish: B.A.
Speech Communication: B.A.
Theatre: B.A., B.F.A.
Urban Affairs: B.A.
Women's Studies: B.A.
Zoology: B.S.

College of Business Administration
Accounting: B.S.
Finance: B.S.
General Business Administration: B.S.
Insurance: B.S.
Management: B.S.
Management Information Systems: B.S.
Management Science: B.S.
Marketing: B.S.
Personnel Management: B.S.
Production and Operations Management: B.S.

College of Engineering
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.
Materials Engineering: B.S.
Mechanical Engineering: B.S.

College of Continuing Education
Bachelor of General Studies: B.G.S.

College of Human Science and Services
Communicative Disorders: B.S.
Consumer Affairs: B.S.
Dental Hygiene: (four years) B.S., (two years) A.S.
Education: (elementary and secondary) B.S.
Home Economics: B.S.
Human Development and Family Studies: B.S.
Human Science and Services: B.S.
Physical Education: B.S.
Textiles, Fashion Merchandising and Design: B.S.
Textile Marketing: B.S.

College of Nursing
Nursing: B.S.

College of Pharmacy
Pharmacy: (five years) B.S.
Respiratory Therapy: B.S.

College of Resource Development
Animal Science and Technology: B.S.
Aquaculture and Fishery Technology: B.S.
Food Science and Nutrition: B.S.
Landscape Architecture: B.L.A.
Natural Resources: B.S.
Plant Science and Technology: B.S.
Urban Affairs: B.S.

Graduate Degrees

Accounting: M.S.
Applied Mathematical Sciences: Ph.D.
- Applied Mathematics
- Computer Science
- Operations Research
- Statistics
- Applied Probability

Audiology: M.A., M.S.
Biochemistry-Biophysics: M.S.
Biological Sciences: Ph.D.
- Biochemistry-Biophysics
- Botany
- Fisheries, Aquaculture and Pathology
- Food Science and Nutrition
- Microbiology
- Natural Resources
- Plant Pathology
- Plant Science
- Zoology

Botany: M.S.
Business Administration: M.B.A.
Chemical Engineering: M.S., Ph.D.
Chemistry: M.S., Ph.D.
Civil and Environmental Engineering: M.S., Ph.D.
Clinical Laboratory Science: M.S.
Community Planning: M.C.P.
Comparative Literature: M.A.
Computer Science: M.S.
Doctor of Pharmacy: Pharm.D.
Economics: M.A.
Economics–Marine Resources: Ph.D.
Education: M.A.
- Education Research
- Elementary Education
- Reading Education
- Science Education
- Secondary Education
- Adult Education

Electrical Engineering: M.S., Ph.D.
- Biomedical Engineering

English: M.A., Ph.D.
Fisheries, Aquaculture, and Pathology: M.S.
Food Science and Nutrition: M.S.
French: M.A.
Geology: M.S.
History: M.A.
Home Economics Education: M.S.
Human Development, Counseling and Family Studies: M.S.
- Human Development and Family Studies
- Counseling
- Marriage and Family Therapy
- College Student Personnel

Labor and Industrial Relations: M.S.
Library and Information Studies: M.L.I.S.
Manufacturing Engineering, M.S.
Marine Affairs: M.A., M.M.A.
Mathematics: M.S., Ph.D.
Mechanical Engineering and Applied Mechanics: M.S., Ph.D.
Medicinal Chemistry: M.S.
Microbiology: M.S.
Music: M.M.
Natural Resources: M.S.
Nursing: M.S., Ph.D.
Ocean Engineering: M.S., Ph.D.
Oceanography: M.S., Ph.D.
Pharmaceutical Sciences: Ph.D.
- Medicinal Chemistry
- Pharmaceutics
- Pharmacognosy
- Pharmacology and Toxicology

Pharmaceutics: M.S.
Pharmacognosy: M.S.
Pharmacology and Toxicology: M.S.
Pharmacy Administration: M.S.
Philosophy: M.A.
Physical Education: M.S.
Physical Therapy: M.S.
Physics: M.S., Ph.D.
Plant Pathology–Entomology: M.S.
Plant Science: M.S.
Political Science: M.A.
- International Relations

Psychology (School): M.S.
Psychology: Ph.D.
- Clinical
- General Experimental
- School

Public Administration: M.P.A.
Resource Economics: M.S.
Spanish: M.A.
Speech-Language Pathology: M.A., M.S.
Statistics: M.S.
Textiles, Clothing and Related Art: M.S.
Zoology: M.S.

The programs listed on the previous page are presented in detail in chapters describing the individual colleges. Interdepartmental curriculums and areas of interest are detailed in the chapter on University Programs and Requirements.

Graduate Study. Study at the graduate level leads to the master's degree in over 60 areas of study and the degree of Doctor of Philosophy in 31. 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 Public Administration
Doctor of Pharmacy
Doctor of Philosophy

Graduate School. Students holding the baccalaureate degree from this University or from another having equivalent requirements 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 undergraduate average approximating B or better and satisfactory scores on a nationally administered examination. Applicants with somewhat lower undergraduate averages but high examination scores may also be admitted in individual cases.

Within each college's chapter in this bulletin, the related graduate degrees are listed. A *Graduate Bulletin*, containing complete information on graduate study and application forms, is available from the Dean of the Graduate School, The University of Rhode Island, Kingston, RI 02881-0809. Further information may be requested from the chairperson of the appropriate department. Applications are returned to the Dean of the Graduate School.

Each applicant must submit (1) completed application forms in duplicate with a $25 nonrefundable application fee (check or money order payable to The University of Rhode Island); (2) three letters of recommendation from individuals familiar with the applicant's work, preferably in the field for which he or she is applying; (3) two copies of an official transcript sent directly from each college or university attended; and (4) scores from the Graduate Record Examination aptitude tests. See the *Graduate School Bulletin* for those programs which require the GRE subject tests or which require a different national test.

Applicants from foreign countries must complete the Test of English as a Foreign Language (TOEFL) with minimum scores of 500 for science students and 550 for nonscience students. All inquiries from international students concerning applications, fees, housing, etc., should be directed to the Office of International Student Services.

The usual deadlines for receipt of applications are April 15 for September and Summer Session admission, and November 15 for February admission. See the *Graduate School Bulletin* for those programs which have earlier application deadlines.

The Graduate School of Library and Information Studies on the main campus offers study leading to the Master of Library and Information Studies degree. Students in undergraduate and other graduate programs may, with the approval of their advisor, enroll in library courses that relate to their studies.

The Graduate School of Oceanography on the Narragansett Bay Campus, six miles from Kingston, offers study leading to the Master of Science and Doctor of Philosophy degrees in the areas of biological, chemical, geological, and physical oceanography. Interested undergraduates may take a 400-level general survey course qualifying for General Education credits as well as certain 500-level courses in the oceanography core curriculum. In addition, qualified undergraduates are eligible for a 400-level, semester-long, full-time program of laboratory and field research working with faculty of the Graduate School of Oceanography. Insofar as possible, the program is tailored to the interests of the student and can range from deep-sea geology to coastal zone planning. There are also two undergraduate programs in oceanography at the University. One leads to a bachelor's degree in physics and physical oceanography and the other to a bachelor's degree in chemistry and chemical oceanography.

The 165-acre Narragansett Bay Campus has about 4,000 feet of shorefront and docking facilities for its fleet of research vessels, the largest of which is a 177-foot ocean-going research ship, *Endeavor*.

More than 20 permanent buildings house offices, laboratories, and special scientific facililties on the Bay Campus. They include the Pell Marine Science Library, a 12,000-square-foot research aquarium, a towing test tank, and a unique facility which permits controlled ecosystems experiments. The two-megawatt research reactor of the Rhode Island Nuclear Science Center is also located there.

Academic Services

The University Libraries. The University's library collection of 852,420 bound volumes and 1,038,548 volume-equivalent microforms is housed in the University Library in Kingston, at the College of Continuing Education in Providence, and in the Claiborne 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 which 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 90 hours a week it is open. Terminals linked to the Academic Computer Center are available in the Library during the hours both facilities are open.

The Academic Computer Center. The Academic Computer Center (ACC) provides computational resources needed by the University community for instruction and research. Located in Tyler Hall on the Kingston campus, the ACC maintains central computing facilities, supports microcomputing activities, provides facilities management and data communication assistance to departmental systems, and offers a wide variety of support services in these areas. The computer network and related services have been expanding steadily since the Center opened in 1959, and now a majority of the students, faculty members, and staff use the facilities.

The Center has an IBM 4831-3 mainframe computer, two Prime 9955 mini-

computers, and a Prime 9755 minicomputer used for CAD/CAM applications. Several hundred ASCII terminals are located in public terminal clusters and private offices. These terminals are connected to a MICOM data switch which provides access to the ACC systems and to remote independent computers. Also available are extensive dial-up facilities and access to BITNET, the international network for educational centers. The mainframe uses both the IBM OS/MVS/TSO and VM/CMS operating systems to provide large-scale computing. The minicomputers use the PRIMOS operating system to provide medium-scale computing. A full complement of programming languages and packages is available on all systems. Remote job entry services to the mainframe are available from Prime, TSO, and departmental system users. Self-service printers are located at major terminal clusters. Extensive computer graphics and text processing facilities are also offered.

The ACC provides facilities management services for campus microcomputer laboratories featuring both IBM PC compatible and Apple Macintosh personal computers. Numerous application software packages are available. The microcomputer laboratories are used for faculty research and teaching and for student coursework. In addition, two computer classrooms with twenty terminals each are available.

A resource room in Tyler Hall is equipped with several Macintosh and IBM PC microcomputer systems. This facility serves as a center for getting hands-on experience with microcomputer hardware, software, and peripheral devices. Additionally, microcomputer vendors contribute and loan hardware and software on a temporary basis for demonstration and user evaluation.

Research and Extension

Within the state system of higher education, the University has the major responsibility for graduate education which is interdependent with a strong program of research. There are active research programs in almost all departments of the University. Support comes from foundations, commercial firms, federal and state governments, and the University. Applications for research grants are signed by the University's Director of Research who is the liaison officer for the president, the business manager, the academic deans, the Research Committee, and the faculty in matters pertaining to general research policy.

In addition to research conducted in the various departments, the University has established a number of research and extension programs in specially defined areas; these are described in detail in the Appendix.

The University distributes the results of its research in publications available to the public. These include a series of marine bulletins, technical reports, and Cooperative Extension and Agricultural Experiment Station bulletins.

The University also publishes through the *University Press of New England*, of which it is a member. Manuscripts originating on the seven member campuses and elsewhere are published as determined by the director and the editorial board on which the University is represented.

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, and administrative personnel that they have been unfairly dealt with in the normal channels of administrative process. The ombudsman is a tenured member of the faculty, elected by the general faculty, and is assisted by a student nominated by the Student Senate and appointed by the president.

The Instructional Development Program exists to help the faculty in its teaching responsibilities. Faculty 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 62,000 members, promotes the interests of the University and maintains the ties of alumni with their alma mater through programs, services, and the publication of a bulletin. An annual fund drive provides scholarship and other University aid.

The University receives less than half 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.

Affirmative Action and Nondiscrimination. The University of Rhode Island prohibits discrimination on the basis of race, sex, religion, age, color, creed, national origin, handicap, 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, and Section 402 of the Vietnam Era Readjustment Assistance Act of 1974.

Most buildings on campus are architecturally available to the disabled (see map on page 196) and provision is made to insure that no student is prevented from pursuing a course of study because of restricted access to buildings.

Inquiries concerning compliance with antidiscrimination laws should be addressed to the Special Assistant to the President for Affirmative Action, President's Office, Administration Bldg., tel. 792-2442; or to the Director, Office for Civil Rights, Department of Education, Region I. Questions regarding provisions for the disabled should be directed to Handicapped Services in the Office of Student Life, 332 Memorial Union, tel. 792-2101.

Programs and Requirements

Consistent 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 that are University-wide rather than college-related.

The 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. Study options vary from the traditional liberal education to programs which 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, and/or the staff of the Office of Career Services. For students who are uncertain about their career choices, the Counseling Center offers help.

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 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 interest of the institution.

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

The New England Association of Schools and Colleges, Inc., is a nongovernmental, nationally recognized organization whose affiliated institutions include elementary schools through collegiate institutions offering post-graduate 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 which has available the necessary resources 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 forseeable 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 may also contact the Association of The Sanborn House, 15 High Street, Winchester, MA 01890. Phone: (617) 729-6762.

The national accrediting agencies which have approved the quality of certain course offerings and programs of study include the American Association of Universities, the American Assembly of Collegiate Schools of Business, the American Chemical Society, the American Council on Pharmaceutical Education, the American Dental Association (Council on Dental Education), the American Psychological Association, the American Society of Journalism School Administrators, the American Speech-Language-Hearing Association, the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology, the National Association of Schools of Music, the National League for Nursing, and the State University of New York.

The University is also an approved member institution of the American Association of University Women, the Association for Continuing Higher Education, the Council of Graduate Schools

in the United States, the North American Association of Summer Sessions, and the National University Continuing Education Association.

General Education Requirements

These requirements apply to entering freshmen beginning in the fall of 1981, and transfer students who entered in the fall of 1981 with fewer than 16 transferrable credits. Students who entered prior to fall 1981 must follow the General Education requirements outlined in the Undergraduate Bulletin for 1980-81 or the year in which they matriculated at the University. Students returning after an absence of more than eight years must follow the current General Education requirements.

The University of Rhode Island believes that all undergraduate students, regardless of their degree program, need experience in the study of fundamentals which builds upon the student's previous education and continues to be advanced through the undergraduate years and beyond. Thus, all bachelor's degree students follow the same University-wide General Education requirements.

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 these three goals: (1) develop further the essential English communication abilities upon which advanced studies depend; (2) offer experience in five broad subject areas: fine arts and literature, letters, mathematics, natural sciences, and social sciences; and (3) expose the student to a foreign language or culture.

The General Education program is divided into the following components which correspond to these goals:

English Communication. *6 credits* in English communication, at least 3 of which must be in a course designed specifically to improve written communication skills;

Fine Arts and Literature. *6 credits* in courses related to historical and critical study of the arts and literature as well as creative activity;

Foreign Language or Culture. *6 credits* or the equivalent in a foreign language or foreign culture;

Letters. *6 credits* in courses which address fundamental questions about the human condition, human values, and ways of communicating these values;

Mathematics. *3 credits* in a course specifically designed to provide training in college-level quantitative skills and their application;

Natural Sciences. *6 credits* in courses in physical, chemical or biological sciences;

Social Sciences. *6 credits* in courses related to the study of the individual (development and behavior) and society.

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

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

Fine Arts and Literature (A): ART 101, 103, 120, 203, 207, 215, 231, 233, 251, 252, 263, 265, 284, 285, 359, 374; CLA 394, 395, 396; CLS 160, 250, 335; ENG 160, 241, 242, 243, 247, 248, 251, 252, 260, 263, 264, 265, 280; FRN 327, 328, 391, 392, 393; GER 325, 326, 391, 392; HPR 101; ITL 325, 326, 391, 392, 395; MUS 101, 106, 111; PLS 201, 233; RUS 325, 326, 391,392; SPA 303, 306, 391, 392; SPE 231; 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 examination[1] or by successfully completing 104 in a living language or 302 in a classical language; (3) coursework 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) coursework 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*, ART 354, CLA 394, 395, 396, 397, ENG 366, GRK 109, 110, HIS 111, PHL 321; *East Asia*, HIS 171, 374, 375, PHL 331, RLS 131; *France*, ART 265, FRN 392, 393, HIS 330; *Germany*, GER 392, HIS 125, 326, 327; *Ireland*, APG 325, IRE 391, 392; *Islamic Civilization*, HIS 174, 175; *Israel*, HIS 378, PSC 321; *Latin America*, APG 315, HIS 180, 381, 382, 383, 384; *Medieval Europe*, ART 356, HIS 112, 304, ITL 395, PHL 322; *Modern British Civilization*, ENG 252, HIS 123; *Modern Europe (Early)*, ART 359, HIS 113, 306, 307, 314, PHL 323; *Modern Europe*, ART 363, HIS 114, 310, 311, 315, PSC 401; *Renaissance in Europe*, ART 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. *Formally registered international students and students with a recognized immigrant status shall be exempt from the foreign language or foreign culture requirement.*

Letters (L): APG 327; BGS 392; HIS 103, 105, 110, 111, 112, 113, 114, 115, 116, 118, 122, 125, 132, 141, 142, 143, 145, 150, 171, 180, 304, 305, 306, 307, 309, 310, 311, 315, 321, 322, 323, 324, 325, 327, 332, 333, 340, 341, 342, 346, 353, 354, 381, 382, 383, 384, 398; HPR 104; NES 200; NUR 360; PHL 103, 104, 110, 117, 312, 314, 318, 319, 321, 322, 323, 324, 325, 328, 331, 346, 355; PLS 202; PSC 240, 341, 342 PSY 310; RLS 111, 125, 126, 131, 227; SPE 200, 205, 210.

Mathematics (M): CSC 201; EST 220; MGS 101, 102; MTH 107, 108, 109, 111, 141, 142.

Natural Sciences (N): APG 201; AST 108; AVS 101; BGS 391; BIO 101, 102; BOT 111; CHM 100, 101, 102, 103, 105, 112, 114, 124, 191, 192; FSN 207; GEL 100, 102, 103, 105, 106; HPR 103; NRS 212; OCG 401; PHY 111, 112, 120, 130, 140, 185, 186, 213, 214, 285, 286; ZOO 111, 286.

[1]Students who fulfill this requirement through an examination cannot earn course credit for graduation. Students who earn less than 6 credits in fulfulling the requirement should apply credits to the elective or major areas.

Social Sciences (S): APG 200, 202, 203, 220, 319; BGS 390; CNS 220; ECN 125, 126, 300, 361; EDC 102, 312; ENG 232, 330; FSN 150; GEG 100, 102, 104; HCF 220; HLT 123; HPR 102; 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, 210, 212, 214, 216, 224, 238, 240, 241, 242, 316, 330, 336; SPE 220; TMD 224; WMS 200.

Honors students may receive General Education credit for honors sections of courses which have been approved for General Education credit.

Transfer students may 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 above lists. Therefore, students must refer to the requirements specified for their programs (pages 29-79).

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 towards 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 towards any General Education requirements. However, courses which serve as prerequisites for a major may be used to fulfill the General Education requirement.

Other Academic Requirements

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

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 College of Continuing Education must have prior approval from their academic deans.

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 listed below; for interdepartmental majors in Comparative Literature Studies, Consumer Affairs, Human Science and Services, and Women's Studies, refer to the Index at the back of this catalog.

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 (6 credits). In addition, students select four electives (12 credits) from the following: AAF 250, 360, 390, 410, 474; APG 250, 313; ECN 404; ENG 247, 248, 360, 362, 363, 364, 474; HIS 150, 384, 388; PSC 408, 410; and SPE 333. 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.

Comparative Literature Studies. Students who declare Comparative Literature Studies as a minor must earn 18 credits distributed as follows: 6 credits in CLS at the 200 level or above; 12 credits from literature courses in Comparative Literature Studies, English, or Languages, of which 6 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 page 35.

Consumer Affairs. Students who declare a minor in consumer affairs are required to complete 18 credits in selected coursework. Suggested courses might include: CNS 220, 320, 350, 420, 422, and 457, as well as courses in political science, marketing, and business law. For a major in consumer affairs see page 66.

Gerontology (The Study of Human Aging). The Program in Gerontology is a University-wide program which promotes study, teaching, and research in aging throughout the University. It also maintains relationships with state and local agencies which serve 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 degree in Human Science and Services is limited to 15 students a year. There is also 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 not 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.

HCF 220 (Gerontology: Theory and Application) is required for either specialization. It also meets a social science requirement in General Education. Undergraduate gerontology courses include HCF 221, 420, 422, 431; CNS 342, DHY 462, FSN 307, RCR 416 and SOC 438. Also relevant are ZOO 242, HCF 380, 421, 450, NUR 346, and the University Year for Action.

It is important to take courses which 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.

Information Science. Students who declare an information science minor are required to take two courses: ISC 344 and 348 (6 credits). In addition, students select four courses from one of two groups which are: Group A: ACC 415; CSC 201, 202, 301, 406; EST 431, 408 or 409, 412, 413; ELE 205, MGS 201, 202, 207, 307, 309, 483, 485; or Group B: CSC 320; EST 220, JOR 110, 436, 438; MGS 484; PHL 101; PSY 384; SPE 301, 440; LSC 413, 549. The program of study must be approved in advance by the instructor of either ISC course or by the Director of the Graduate School of Library and Information Studies. This program is limited to juniors and seniors.

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: (1) Cultural Patterns—PSC 221, APG 317; ENG 337, (2) Aesthetic Dimensions —ART 263, ENG 347; 340, (3) Historical Dimensions—HIS 335, 346, 362; (4) Physical Dimensions—BOT 323, 418; NRS 301, 302, GEL 101. Permission may be obtained from the Committee for New England Studies to use any rotating top-

ics course, seminar, etc., whose focus is on some aspect of New England as a substitute for any of the above courses.

Special Populations. This interdepartmental minor provides 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 (NUR 101, HCF 200 or PSY 232, PSY 442), a minimum of 3 credits in supervised field experience, and a minimum of 7 credits of selected electives.

Courses are chosen in consultation with an advisor from one of the participating departments: Education; Food Science and Technology; Human Development, Counseling and Family Studies; Nursing; Physical Education, Health and Recreation; Psychology; Sociology; Speech Communication; Textiles, Fashion Merchandising and Design; Theatre. The College of Human Science and Services administers the program and interested students should contact the program head, Jeannette E. Crooker, 130 Tootell Center.

Textile Marketing. This undergraduate interdepartmental curriculum may be pursued through the College of Human Science and Services (Department of Textiles, Fashion Merchandising and Design) or through the College of Business Administration (Department of Marketing). The programs are: Textile Marketing or Marketing-Textiles.

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. The specific requirements of the curriculum may be found on pages 50 and 69.

Urban Affairs. The undergraduate program in Urban Affairs consists of five different interdepartmental degree curriculums: three in the College of Arts and Sciences and two in professional colleges. They aim to provide students with a general understanding of contemporary urban society and the opportunity to pursue specialized study of urban problems and prospects from the perspective of varied disciplines, whatever may be the students' interests and career objectives.

The five majors are: (1) Urban Social Processes, (2) Policy Formation, and (3) Spatial Development, in the College of Arts and Sciences; (4) Home Economics in the Urban Environment, in the College of Human Science and Services, and (5) Resource Development in the Urban Environment, in the College of Resource Development.

The curriculum in each major consists of common core courses and specialization courses. The common core (18 credits) is made up of the following requirements: URB 210 and URB 498 or 499 (6 cr.); three credits selected from CSC 201, EST 220, 408 or 409, MGS 201, PSY 300, SOC 301; and 9 credits selected from CNS 340, CPL 410, ECN 401, 402, HIS 339, 363, PSC 460, 495, SOC 214, 240. The specialization courses are detailed in the appropriate college section in this bulletin.

The Urban Affairs Program is coordinating its offerings with the Department of Social Sciences at the Community College of Rhode Island. Students at the junior college are encouraged to consult with their advisors if they wish to transfer to any one of the majors in the College of Arts and Sciences.

The Urban Affairs Program Coordinating Committee includes faculty members from departments throughout the University and supervises the operation of the program. With the endorsement of the faculty of the college concerned, the committee certifies completion of the major requirements for the appropriate undergraduate degree. A member of the committee serves as advisor for each of the five majors and provides interested students with information.

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 may 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 dependent upon their own individual intellectual interests and upon "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."

Premedical Studies. For students who plan professional study in medicine, guidance and program coordination is provided by the premedical advisor and the URI Premedical, Predental, Preveterinary Advisory Committee, known as The Premedical Advisory Committee (Rm. A123, Biological Sciences Bldg.).

The student should consult the prerequisites for professional schools to which he or she may expect to apply for admission. 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 in the Premedical Office, A123, Biological Sciences Bldg.

Medical schools generally require at least a 3.30 grade point average and high

scores on the required Medical College Admission Test (MCAT), taken preferably in the spring semester of the third undergraduate year.

From an evaluation of the distribution of scores of the test, it is reasonable to assume that successful applicants to medical schools will rank in the intervals with a mean of 10 or above in the 15-interval scoring system. Similar results are expected on the Dental and Veterinary Medical School Administration tests although their scoring systems differ.

All candidates must have personal interviews with the Premedical, Predental, Preveterinary Advisory Committee. Normally these interviews will take place during the spring semester of the third undergraduate year.

Since only about one third of each 100 applicants to medical schools are admitted, it is wise to plan for an alternative career.

The University of Rhode Island-Brown University Early Identification Program for Rhode Island Residents. This is a plan for the early identification and acceptance into the program in medicine at Brown University of highly motivated, exceptionally qualified and interested students at The University of Rhode Island and at Providence College. The plan offers virtual assurance of a position in Brown's program in medicine, so long as the student completes the required courses and maintains a good academic performance. The program is designed to encourage a few of the most highly motivated students, who are Rhode Island residents, to make an early commitment to the study of medicine at Brown by providing them with acceptance assurance similar to that afforded students entering Brown's optional medical education program directly from high school.

URI students with cumulative averages of 3.40 and above are interviewed and evaluated by the URI Premedical, Predental, Preveterinary Advisory Committee after the completion of their freshman year. Certain of these students are then recommended to Brown by the URI Premedical Advisory Committee on the basis of an *excellent academic record, exceptional promise* as a premedical student, *apparent suitability* for the profession of medicine, *Rhode Island residency* and a desire to study medicine at Brown. During the sophomore year, the nominated students are interviewed and their applications are evaluated for admission to the program.

Upon acceptance, they have the same status as their Brown counterparts, while continuing their studies at The University of Rhode Island. Like the Brown students, they are free to major in the arts or humanities, if they wish, as long as they complete the required premedical courses. As undergraduates they are also invited to take one or two of their premedical courses on the Brown campus with their future classmates, and are invited to colloquiums and various social events sponsored by the Brown Medical Student Society.

After the students in the Early Identification Program have been graduated from URI, at the point of entering the first year of the program in medicine at Brown, they go through the same promotions process required of all medical education program students. Academic performance, interviews with members of the Admissions Committee, Medical College Admissions Test (MCAT) scores, and faculty recommendations are all reviewed. Upon promotion they become full-fledged first-year medical students at Brown University.

Rhode Island resident students interested in this program are urged to register with the secretary of the Premedical Advisory Committee during the spring semester of their freshman year or early during the fall semester of the second year at URI.

Predental Studies. The recommendations for premedical preparation also apply to predental students, who are counseled by the same advisory committee.

The student should consult the course requirements for each dental school to which he or she may expect to apply for admission. These are listed in *Admissions Requirements of American Dental Schools*, published annually by the American Association of Dental Schools.

The Dental Admissions Test (DAT) is required, and normally this test is taken in the spring of the third undergraduate year. Competition for admission into dental school is as keen as that experienced by premedical students. Thus, an excellent academic record, along with a 5 or 6 in each section of the test, usually is required.

Each candidate must have personal interviews with the URI Premedical, Predental, Preveterinary Advisory Committee. Normally these interviews will take place during the spring semester of the third undergraduate year.

Premedical and Predental Curriculum. A premedical or predental student may choose to study in any liberal arts, science, or professional college, so long as the courses that are required by medical schools are included. Most students major in one of the biological or health sciences, or in a related field, such as pharmacy or chemistry.

A recommended course of study is outlined below. Italicized items are *indispensable* for admission to any medical or dental school. Ideally, these courses, or their equivalents, should be substantially completed before the MCAT or the DAT is taken.

Chemistry. At least 16 semester-hour credits, including *general inorganic*, qualitative, and *organic:* physical chemistry is sometimes required and is frequently recommended: *CHM 101, 102, 112, 114, 226, 227, 228;* and in some cases 431 and 432, each with the associated laboratory.

Biology. At least 11 credits, including *general animal biology*, embryology, physiology or anatomy, genetics: ZOO *111*, 316, 321, or 345, BOT 352.

Physics. *At least 8 credits including PHY 111, 112.*

Mathematics. At least 6 to 9 credits, through calculus, MTH 141, 142.

English and Communications. At least 12 credits, *including WRT 101, 201 and a year of literature.*

Modern Foreign Language or Greek or Latin. Through the intermediate level.

Social and Behavioral Studies. At least 6 credits. Psychology: PSY 113. Sociology: SOC 100.

Preveterinary Studies. Students who are interested in preparing for a professional career in veterinary medicine are counseled by the URI Premedical, Predental, Preveterinary Advisory Committee. Requirements for admission into the study of veterinary medicine vary and the catalogs of veterinary schools should be consulted for specific requirements early in a student's undergraduate years. Many schools require the Veterinary Aptitude Test (VAT) or the Graduate Record Exam (GRE). Ordinarily, either test should be taken in the spring semester of the third undergraduate year. Moreover, some experience in the animal sciences is ex-

pected by some veterinary medical schools.

A preveterinary student may choose to follow the Bachelor of Science curriculum in Animal Science (described elsewhere in this catalog), or he or she could be guided by the course of study recommended above for premedical and predental students.

Each candidate must have personal interviews with the URI Premedical, Predental, Preveterinary Advisory Committee. Normally these interviews will take place during the spring semester of the third undergraduate year or fall semester of the senior year.

Competition for admission into schools of veterinary medicine is extraordinary. Therefore, evidence of high motivation and an outstanding academic record are essential.

Special Academic Opportunities

Honors Program. The University Honors Program offers bright and 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 which 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 on the 100 and 200 level treat general topics and usually count for General Education credit in particular divisions. Those on the 300 and 400 level are more specialized and often are used to fulfill the requirements of a major.

Eligibility standards are established yearly 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 grade 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 which 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 junior year and must complete a minimum of 15 honors course credits which meet the following requirements: 1) 6 credits in 100- and 200-level honors courses including at least three credits of the colloquium; 2) 9 credits in 300- and 400-level honors courses including three credits of a tutorial and six credits of the honors project or special seminar; and 3) a 3.20 grade average for honors courses and a 3.20 cumulative grade point average.

See page 111 for a list of honors courses.

National Student Exchange Program. The National Student Exchange Program offers University of Rhode Island students the opportunity to study at more than 80 participating state colleges and universities in 39 states at 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 National Student Exchange Coordinator, University College.

New England Land-Grant Student Exchange Program. Students with special academic interests may now take advantage of the talent and resources available at the state universities of the region without having to become a degree candidate at another institution. Under a cooperative agreement, 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 which is not available at URI. Students participating in this program pay their normal URI tuition and fees and maintain their status as URI students. Advisors or members of the University College staff have more information about this program and its requirements.

Ocean Studies. Undergraduates are encouraged to explore opportunities on 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 credits. 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.

Study Abroad. The Study Abroad Office maintains information about overseas study programs and helps students make arrangements for foreign study. The Office also assists in the evaluation of credits from study abroad. The University of Rhode Island sponsors exchange programs with universities in England, France, Germany, Italy, Japan, and Spain. Many of these exchange programs make study abroad available to our students for little or no cost beyond the normal URI tuition and fees. The University also participates in the New England–Quebec exchange program enabling our students to study at any one of the ten English and French-speaking universities in Quebec on an exchange basis. Study abroad programs at the other New England land-grant universities and at institutions participating in the National Student Exchange Program may also be open to our students. The Study Abroad coordinator helps students who wish to participate in these or other approved academic programs to choose the appropriate programs and to handle the procedures for obtaining prior approval for courses to be taken abroad and for retaining matriculated status at The University of Rhode Island during their absence from campus.

University Year for Action. UYA Internship Program is administered by the Office of Internships and Field Experience. It 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 up to 15 credits in free or professional electives.

Students work full time under the supervision of qualified professionals in carefully selected settings. A weekly sem-

inar brings interns together to discuss issues that emerge during the internship. The program offers students a choice of more than 400 placements that include the categories of law, counseling, advocacy, administration, public relations, communications, alternative education, health, nutrition, marketing, art, management, and medical research.

To apply, students must have a minimum QPA of 2.50 and junior or senior standing.

Dean's List

Undergraduate 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 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 completed an accumulation of 12 or more credits for letter grades and achieved a 3.30 quality point average.

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 by the college in which he or she is enrolled as free, unattached electives. Courses that are stipulated 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. If a student has selected the P/F option for a course, then decides not to use the P/F option, he or she may change by notifying the Registrar before the last date for dropping courses.

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

Army Reserve Officers Training Corps (ROTC)

Army Reserve Officer Training (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 will be commissioned in the United States Army. Delayed entry on active service for the purpose of graduate school 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, and military history are fulfilled through required University general education courses and the military science curriculum. Three variations of ROTC are available:

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

The two-year ROTC program, which begins with a six-week Camp Challenge summer training session (with pay). Upon successful completion of Camp Challenge, the student enters the third year of ROTC and will attend 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 the ROTC program during their sophomore year or who intend to complete their academic studies in three years. This program compresses the requirements for the basic course into one year.

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

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, Ranger School, and Nurse Summer Training in Europe.

Grades and Points

Student grades are reported as A, A–, B+, B, B–, C+, 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, 1.00 points; F and U, 0 points. P and S are not calculated in the quality point average.

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

Making up failures in elective courses is not required, but making up failures in required courses is. 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.

Under specified conditions and with the approval of the academic dean, freshmen and transfer students in their first semester may repeat a course in which a grade of C– or lower was earned. The grade earned in the second attempt will be calculated in their quality point average. All grades earned for a given course will remain on the student's permanent academic record.

Certain courses do not lend themselves to precise grading and for these courses, only S (satisfactory) or U (unsatisfactory) shall be given to all students enrolled. S/U courses shall be labeled as such in the University catalogs and bulletins. S/U

courses are not counted as courses taken under the Pass-Fail Option.

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

A student shall 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 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. Students who obtain less than a 1.00 average on their first semester shall be dismissed automatically.

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

Students are expected to be honest in all academic work. Instructors shall have the explicit duty to take action in known cases of cheating or plagiarism. For details consult the *University Manual*, sections 8.27.10–8.27.20.

Leave of Absence

Sometimes students are forced to take a semester or two off due to 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 pre-register for the semester in which they plan to return, and they do not have to apply for readmission. Undergraduate students may apply for a leave of absence through the Office of the Registrar.

Withdrawal from College

A student who wishes to withdraw from the University prior to the end of the semester or Summer Session term shall do so according to procedures outlined in the semester's *Schedule of Courses*. If the withdrawal process is completed satisfactorily and the student has cleared all financial obligations to the University, the date of withdrawal shall be noted on the student's permanent academic record. No grades for the current semester shall be recorded. Students who withdraw from the University after the last day of classes but before a semester ends, shall be graded in all courses for which they are officially registered. If a student withdraws from the University after mid-semester, grades shall be recorded for any course which has an officially specified completion date prior to the date of withdrawal.

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

Undergraduate 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 must have earned at least a 2.00 quality point average.

The work of the senior year shall be taken 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.

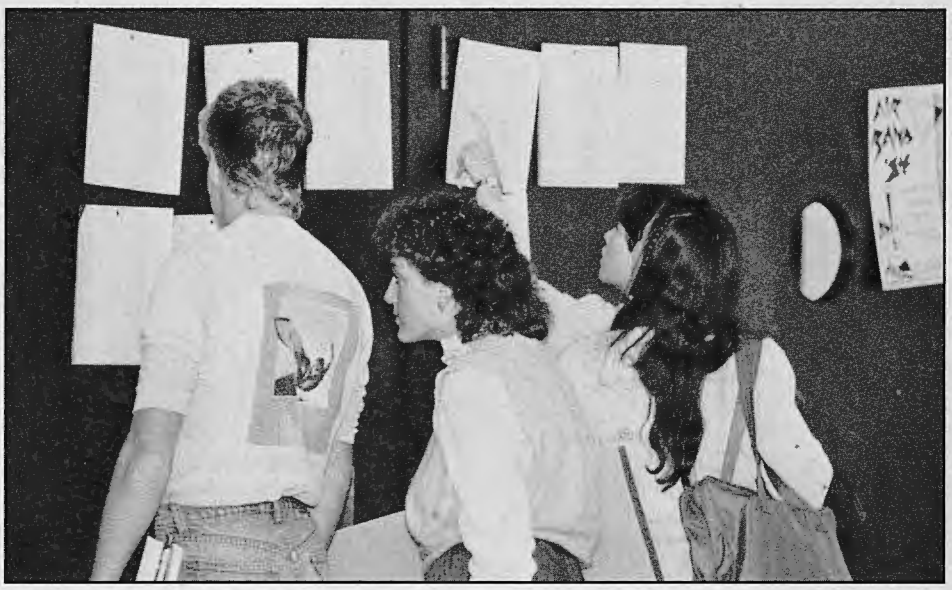
Any student who has met the requirements for two separate majors within any single bachelor's curriculum has earned a double major and may have both fields listed on his or her permanent record.

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

University Manual

University regulations governing matters such as grading, probation and dismissal, academic integrity, withdrawal from college, 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.

Admission and Registration



Admission to the University

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. Students are selected for enrollment primarily on the basis of their academic competence and without regard to age, race, religion, color, sex, creed, national origin, handicap, or sexual orientation.

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

All freshmen pursuing four- or five-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 grades earned. Performance on standardized tests (SAT or ACT), extracurricular activities, alumni tradition, and letters of recommendation are considered. Of the entering freshmen in the fall of 1987, two-thirds ranked in the top 40 percent of their high school class. The average SAT scores were Verbal 455 and Math 506, both well above the national average.

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 are expected: 4 units in English, 3 in algebra and plane geometry, 2 in physical or natural science, 2 in history or social science, 2 in foreign language, and additional units that meet the requirements of the college in which the candidate expects to study for his or her 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 Colleges of Business Administration and Engineering, and majors in chemistry, computer science, and physics, must complete 4 units of mathematics (trigonometry). Candidates for the College of Engineering should select chemistry *and* physics. Applicants to the Bachelor of Music degree program must audition and must contact the Department of Music for specific requirements.

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 on individual problems. Requests for application forms and information should be directed to the Office of Admissions, The University of Rhode Island, Kingston, RI 02881-0807.

Inquiries from international students concerning nonimmigrant visas, housing, etc., should be sent to the Office of International Student Services, Lower College Road, The University of Rhode Island.

Students are enrolled at the beginning of the fall semester in September and at the beginning of the spring semester in January. High school seniors are urged to submit applications early in their final year of preparatory study as the University subscribes to a "rolling" admissions policy, reviewing folders as soon as one set of senior-year grades is available and complete credentials are submitted. Closing date for fall term applications is March 1, and most decisions are reported in February, March, and April. Closing date for spring term application is December 1. For international students the closing date is November 1.

Early decision is made on the application of any freshman candidate who has

established a superior academic record, who has achieved above-average scores on the CEEB Scholastic Aptitude Test, and whose potential as a superior student is reflected in the secondary school endorsement. Applications which meet these qualifications and which are clearly labeled "Early Decision Candidate" are considered on a priority basis if filed prior to November 1.

Entrance Tests. All freshman candidates for admission are required to take the Scholastic Aptitude Test (SAT). Applicants who have been away from formal studies for at least three years should contact the Admissions Office concerning entrance requirements.

Applicants are encouraged to take the SAT as early as possible in their senior year; delay beyond January date materially 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, New Jersey 08540.

International students who are not immigrants must take an English proficiency test administered by the American Consulate or the Test of English as a Foreign Language (TOEFL) administered by the Educational Testing Service, Princeton, New Jersey 08540, U.S.A. Additionally, the SAT is required as outlined above. English placement tests are required of all incoming undergraduate students.

Interviews. Personal interviews are not part of the normal admissions procedure. It would be impossible for the admissions staff to interview all candidates, and individual conferences are arranged only if a unique problem requires personal discussion.

Group conferences are scheduled several afternoons each week during the year. Students and their parents are invited to participate in these meetings to get acquainted with the University. Visitors are requested to phone ahead (401-792-2737) to be scheduled for these meetings.

Campus Tours. The University provides daily tours of the campus for visitors, Monday through Saturday, while classes are in session. The tours are conducted by students. Group tours for high schools and other organizations may also be arranged. For more information about this service, phone (401) 792-2737.

Tours of the Narragansett Bay Campus and the Graduate School of Oceanography may also be arranged. Phone (401) 792-6211 for details.

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 would normally have completed: 3 years of English, 3 years of mathematics, 2 years of foreign language, 2-3 years of social studies or history. 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 (11th) year and direct further inquiries to the University 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 or better the CEEB Advanced Placement Examination in the subject area for which advanced placement is sought. In addition, students also may 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 who have attended, or are attending another college or university, are required to 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. Most successful applicants offer a cumulative grade point average above 2.40. Certain programs may require a higher grade 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 on page 10.

Proficiency Examinations. Students who show evidence of advanced knowledge or who have taken "enriched" programs in high schools 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.

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

College Level Examination Program. *CLEP General Examinations.* 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. 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[1])	450
Fine Arts (Fine Arts elective, 3 cr.)	46
Literature (Literature elective, 3 cr.)	45
Biological Sciences (Natural science elective, 3 cr.)	46
Physical Sciences (Physical science elective, 3 cr.)	44
Social Sciences (Social science elective, 3 cr.)	46
History (History elective, 3 cr.)	45
Mathematics (no credit)	

[1]Three additional credits may be earned by completing a writing sample test administered by the College Writing Program.

CLEP Subject Examinations. Academic departments may use CLEP Subject Examinations as proficiency exams to test students' mastery of the subjects taught by the department. A department which 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[2] (HIS 141, 142)	45	40th
American Literature (ENG 241, 242)	46	37th
Analysis & Interp. of Literature (ENG or WRT 103)	49	43rd
Biology (BIO 101, 102)	49	47th
College Algebra-Trig. (MGS 101 or MTH 109)	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 & Devel. (HCF 200 or PSY 232)	47	38th
Introd. 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[2] (100-level HIS elective)	46	52nd
Western Civilization II[2] (100-level HIS elective)	47	52nd

Health Questionnaire. Every newly entering student is provided a health questionnaire from University Health Services. It is expected that these questionnaires will be completed and returned promptly. This questionnaire provides University Health Services with basic health information prior to the student's arrival on campus. Questionnaires are distributed only after admission to the University and therefore play no part in the process of acceptance to the University.

In accordance with Section 16-38-2 of the General Laws of Rhode Island, the University must have a certificate signed by a licensed physician giving proof of protection against rubella (German measles) and rubeola (measles) for all incoming students. This certificate is included with the questionnaire.

New England Regional Student Program. Under the cooperative plan of the New England Board of Higher Education (NEBHE), students from other New England states are admitted to certain curriculums 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 25 percent. However, if the student transfers out of the program of study that qualifies under 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 high school guidance offices. The Office of the Registrar provides information pertaining to this program for students who are already enrolled at the University.

Prospective students who wish to claim eligibility for this program must state so in the appropriate section on their application for admission. Continuing or returning students claim eligibility by contacting the Office of the Registrar with a formal request 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 applicants whose educational background is below college preparatory level, 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 Financial Aid 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 Admissions Office, Green Hall, during the application period between October 1 and March 1.

Readmission. Students formerly enrolled at the University and seeking reentry, 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.

Preregistration. The University preregisters matriculated (official degree-seeking) students who meet the elegibility requirements as defined in the *Schedule of Courses*. Preregistration generally occurs in March and October for the following semester. However, freshmen entering in the fall semester may preregister at specified dates during the summer as part of the summer orientation program. Additional information is available from the Office of the Registrar.

Registration Day. This is held the day before classes begin for both the spring and fall semesters. All matriculating students who did not preregister (or who did not receive a final schedule) must register at Keaney Gymnasium on this day.

Late Registration. Generally, students are expected to either preregister for courses (if eligible) or to register on Registration Day. Those who are unable to do so may enroll as late registrants in the Office of the Registrar during the first two weeks of classes. A late registration fee shall be charged unless excused by the Registrar (see p. 21).

[2]Optional essays required

Nonmatriculating Students. Such students must apply each semester to the Office of the Registrar for permission to enroll and for registration instructions. Registration takes place during the first two weeks of classes.

Payment of Fees. Arrangements must be made with the Bursar for complete payment of tuition and/or fees. If, during the semester, it becomes apparent that a student has not met his or her financial responsibilities with the University, the registration for that semester is subject to immediate cancellation.

Drop and Add. Students are permitted to add courses during the first two weeks of classes only. Courses offered by the College of Continuing Education may be added, with approval of the instructor, prior to the third class meeting or by the prescribed University deadline, whichever is later.

A course may be dropped by official procedures determined by the Registrar before the end of the fifth week of the semester. 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" on page 20). Departments shall have the authority to designate selected courses as "early drop" courses which may be dropped up to two days before the end of the add period. Early drop courses will be designated in the *Schedule of Courses*. When such courses are offered by the College of Continuing Education they may be dropped at any time prior to the third class meeting or by the prescribed University deadline, whichever is later. Graduate students may drop courses at any time up to midsemester. If the student has not dropped a course by the end of the drop period the instructor must submit a grade. 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 which must be filed in the Office of the Registrar before the end of the "add" period. The course instructor shall determine the extent to which an auditor may participate in class activities. An auditor's name shall not appear on official class rosters, and the course will not be noted on the grade report or on the permanent academic record.

Flexible Scheduling. Simultaneous enrollment in Kingston classes and College of Continuing Education classes may give scheduling flexibility to students with special time and location restrictions. Students should consult their academic advisor or college dean for further information.

Off-Campus Study. A full-time student who wishes to study at another college or university and use that coursework 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 registered status and preregistration eligibility while studying off campus, must register for off-campus study for each semester of absence from The University of Rhode Island.

Veterans' Educational Benefits. Full information describing these benefits may be obtained from your base education officer or from the Veterans Administration Regional Office, 380 Westminster Mall, Providence, Rhode Island 02903. A toll-free number is available for inquiries by asking the long distance operator for Enterprise 5050.

Veterans who are eligible and who wish to receive VA educational benefits must notify the Office of the Registrar in person. In order to satisfy Veterans Administration regulations, all students who receive VA educational benefits must report all changes in academic status to the veterans' registration clerk in the Office of the Registrar.

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

The University Manual and the *Graduate Student Manual* further explain the University's policies and procedures concerning the following: 1) the grading system and standards of progress required of the student by the University and the conditions for dismissal for unsatisfactory grades; the allowed probationary period, and the conditions of reentrance for academically dismissed students (see: *University Manual*, Chapter 8; *Graduate Student Manual*, Appendix A; *Students' Guide to URI*, Section 2). 2) the records of academic progress maintained by the University and furnished to the student (see: *University Manual*, Chapter 8; *Graduate Student Manual*, Appendix C). 3) the policies and regulations relating to student conduct and conditions for dismissal for unsatisfactory conduct (see: *University Manual*, Chapters 5 and 6; *Graduate Student Manual*, Appendix A).

Change of Address. It is the responsibility of the student to complete a change of address form in the Office of the Registrar whenever a change is made in his or her local or home mailing address.

Expenses and Student Aid

Expenses

Charges and fees set forth in this bulletin are subject to change without notice.

In addition to the University fees outlined below, a student should expect to spend about $500 per academic year for books and supplies, and allow for additional expenditures for travel and personal needs.

All charges are payable by the semester and are due and payable on receipt of the bill or by the due date indicated on the bill. The Accident and Sickness Insurance fee will be paid directly to the University insurance carrier.

Full-time Students Pay Per Year

In-state fee (general fee)	$1,770.00
Out-of-state fee	5,696.00
Regional student fee[1]	2,214.00
Memorial Union fee	152.50
Student Activity fee	68.00
Accident and Sickness insurance	182.00
Student Health fee	188.00
Registration fee	20.00

Students Living in University Residence Halls Add

Room Rent	$2,055.00 to $2,256.00
Board—	
7-day meal book (20 meals)	$1,625.00
7-day meal book (15 meals)	$1,502.00
5-day meal book (10 meals)	$1,375.00

[1]See page 18 for description of the NEBHE interstate program.

Students Living in a Fraternity or Sorority Add

Average room rent	$1,670.00
Average board	1,705.00

Part-time Students

Part-time students, registered for up to 11 credit hours per semester are charged the fees below:

Tuition, per credit hour	
Rhode Island residents	$74.00
Out-of-state students	238.00
Regional students[1]	93.00
Registration fee per semester	10.00
Memorial Union fee, 1-4 credits	11.25
5-11 credits	22.75
Student Activity fee	17.00

Reassessment of Fees. Students are allowed to drop and add credits during the first two weeks of each semester (add period). Fees are reassessed and adjusted according to the credit enrollment and/or student status resulting from drop/add transactions as processed by the Registrar during the add period. Subsequent to the add period, term bills are only reassessed for part-time students who add credits and full-time students adding credits beyond the credit overload limit. *Note: Dropping credits after the add period does not reduce term bills.*

Credit Overload Fee. A credit overload fee is charged to all students who register for more than 19 credits per semester. It is assessed according to residency and is charged per credit above the 19-credit limit. Enrollment at the Kingston and Providence locations is combined when determining this fee. *Note: Dropping overload credits after the end of the add period does not reduce term bills.*

Kingston and CCE Enrollment. All undergraduate students who are full time because of combined enrollment at both the College of Continuing Education and the Kingston campus (12 credits and over) are assessed the following fees at the standard full-time rate when enrolled in at least 7 credits on the Kingston campus: Memorial Union fee, Student Activity fee, Accident and Sickness insurance, Student Health fee. Students whose enrollment at the Kingston campus is less than 7 credits are charged the fees at the part-time rate. *Note: Dropping credits after the end of the add period does not reduce term bills.*

Resident 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.

An "emancipated student" must establish the same bona fide residency for in-state tuition exemption. An emancipated student shall mean a student who has attained the age of 18 years, 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 nonresident student who reaches 18 years of age while a student does not by virtue of that fact alone become a resident student.

Dependents of members of the armed forces, as well as members of the armed forces stationed in the state on military orders, are entitled to classification as resident students.

The Dean of Admissions classifies each student admitted to the University as a resident or nonresident student on the basis of all relevant information available to him. A student may appeal the decision to the Board of Residence Review. The above information is merely 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 may be obtained from the Office of Admissions.

Tuition Waiver for Senior Citizens. Permanent residents of Rhode Island who are 60 years of age or older are entitled to take courses at the University without payment of tuition, although other fees and charges are still applicable. Admission to particular courses will be granted on a space-available basis. Eligible persons should contact the Office of the Registrar.

New Student Fees. A nonrefundable fee of $25 must accompany each application for admission. See page 16 for application procedure.

An advance deposit of $50 is required from every accepted student. The advance deposit, which is applied on the first term bill, will be forfeited if the applicant later withdraws his or her name.

Students returning after an absence of one or more semesters are subject to the same application fee and advance deposit as entering freshmen.

Student Assessments. Each student is assessed $68 per year which is distributed by the Student Senate to support a wide variety of student programs and activities. A Memorial Union fee of $152.50 per year is also assessed.

Late Fees and Special Fees. A late registration fee is charged to students whose registration is not completed before the first day of classes. The fee is $15 during the week in which Registration Day falls; $50 thereafter.

Expenses for class trips in all courses and those incident to practice teaching in vocational education courses are charged to the students concerned.

Applied Music Fees. Students taking performance courses in music are charged an additional fee each semester of $85 for MUS 050, and $170 for MUS 231, 241, 242, 251, 261, 451, 461, 551, and 561 for private lessons associated with the course.

Student Nurses' Fees. Beginning in the sophomore year, student nurses must purchase authorized uniforms and nursing equipment. The approximate cost is $175.

Transcripts. Each student who graduates from the University is entitled to one official transcript without charge. The fee for all other transcripts is $2, except that the fee for multiple copies ordered at the same time is $2 for the first copy and $1 for each additional copy. Copies will be mailed in response to written requests only, which should be addressed to the Office of the Registrar.

Transcripts will not be issued to students who have any unpaid financial obligation to the University.

Health Service Fees. The health fee of $188 is mandatory for all full-time undergraduates, all international students and spouses, and all full-time graduate students. All international students, spouses, and dependents must enroll in the Student Accident and Sickness Insurance Plan. All other students are required to enroll in this plan unless evidence of comparable coverage in another plan is provided and the student completes, signs, and returns a waiver card to the insurance agent prior to the end of the add period (first two weeks of school). Unless the insurance is waived, the student will be billed. Waiver forms may be obtained directly from Health Services. Part-time students and spouses of students are eligible to participate in the health and insurance plan on an optional basis.

The health fee covers all outpatient care at Health Services with the exception of laboratory and X-ray services. Students must have insurance which covers these services.

Refunds. Refunds of payments made or credits against amounts due to the University shall be made to students who officially withdraw or take a leave of absence according to the following scale: during the first two weeks, 80 percent; during the third week, 60 percent; during the fourth week, 40 percent; during the fifth week, 20 percent; after five weeks, none.

The attendance period in which withdrawal or leave of absence occurs, begins on Registration Day and includes weekends and holidays.

Coverage under the University Sickness and Accident Insurance terminates upon withdrawal of the student for any reason other than graduation or incapacitating disability. Students whose coverage has terminated for reason of withdrawal may request a pro-rata refund of premium from the insurance company. (For further information, refer to the current Student Sickness and Accident Insurance brochure.)

Housing Rates. Following are the rates for University housing for the year 1988–89. For complete information write to the Director of Residential Life, Roger Williams Commons. All rates quoted are for double rooms. For single rooms, where and when available, $100 per year is added to the double rate. Board is mandatory for students living in residence halls.

Residence Halls

$2,104	Adams, Barlow, Bressler, Browning, Butterfield, Hutchinson, Merrow, Peck, Tucker, Weldin
$2,310	Aldrich, Burnside, Coddington, Dorr, Ellery, Fayerweather, Gorham, Heathman, Hopkins

The average projected room rate for fraternities and sororities for 1988–89 is $1,670.

Housing and Dining Contract. University housing is contracted for the *entire academic year.* A deposit of $100 is required at the time of filing application for a room in the residence hall. This deposit will be applied on the first semester bill. A cancellation of the housing application will result in a pro-rata credit on the semester bill according to the following schedule: from date of deposit to June 15, $100; from June 16 to the opening of the residence halls for the academic year, $62; after that time, no refunds will be made.

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 bill from the Office of Residential Life. Checks and money orders 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 under contract will be held responsible for the total charges for the entire period. No refund will be given when a student moves from University quarters to a private home or decides to commute.

In accordance with existing contracts and University loan agreements, all students living in University residence halls are required to take their meals in the University dining halls. Students may choose from one of the following options at prescribed rates: any 10 meals Monday through Friday; any 15 meals Monday through Sunday; any 20 meals Monday through Sunday. Off-campus commuters and members of the campus community other than dorm residents may also choose to purchase any 5 meals Monday through Sunday. Dining contracts begin on Labor Day and expire after dinner on the last day of final examinations.

Students wishing to change from their originally chosen meal plan to another may do so during the first week of classes. Meals are not served during break periods when classes are not in session.

Resident students on all meal plans are provided with a limited number of guest tickets each semester. However, meals for guests or additional meals may be purchased on a cash basis at any dining hall.

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 their physician to Dining Services prior to registration day. Application forms may be obtained by contacting the Dining Services central office at Lippitt Hall at (401) 792-2229.

The University dining system operates on a computerized entry system utilizing the student I.D. card for access to meals. This card must be brought to all meals.

Students who withdraw from the dormitories may obtain Dining Services refunds based upon the University refund policy.

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 Office of Residential Life for damages, obligations required by the University Judicial System) may result in the cancellation of preregistration for the following semester, denial of registration until the payment is made, and/or disenrollment. Appropriate University 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.

Student Financial Aid

Financial Aid is money made available from federal, state, local, or private sources which helps students attend the postsecondary 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 attendance at the University. To continue receiving financial aid, it is necessary to reapply and demonstrate sufficient financial need each year as well as maintain satisfactory academic progress.

Financial aid to students is awarded without regard to race, sex, religion, age, color, creed, national origin, handicap, or sexual orientation, and 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 their 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 Student Services at the University.

To be considered for financial aid, a person must have been accepted and enrolled as a matriculated student at the University. Enrolled students must be making satisfactory progress towards their degree according to the University's policy on satisfactory progress (see p. 23).

Application Procedure. Residents of Rhode Island, Massachusetts, Maine, or New Hampshire should complete a Financial Aid Form (FAF) specifically printed for their state. Residents of other states should complete the national Financial Aid Form and check with their state scholarship or grant authority to inquire if another form is needed to apply for state scholarship funds. Students should apply for a Pell Grant by checking the appropriate box on the FAF.

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 Financial Aid Office, all tax schedules must also be included.

Application Priority Dates. The FAF should be mailed to the College Scholarship Service in Princeton, New Jersey, after January 1, but prior to March 1. Applications completed on or before the above priority dates will receive first consideration for financial aid awards; however, we will continue to process applications as long as funds remain available.

Federal Aid Available

Pell Grants. The Pell Grant is designed to form the foundation of all financial aid received. Each applicant is mailed a set of Student Aid Reports which must 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 Student Aid Index printed on the Student Aid Report.

Supplemental Educational Opportunity Grant. This program is intended to assist undergraduate students with financial need. These awards are available in amounts ranging from $100 to $4,000 per year.

Carl Perkins Loan. Eligibility is based on need. Undergraduates are limited to borrowing $4,500 for the first two years of their program with a maximum of $9,000 for four years. Graduate students may borrow up to $18,000 including undergraduate loans. These loans have a simple interest rate of 5% annually. Interest does not accrue until nine months after graduation, termination of studies, or enrollment for less than half time. Minimum payments of $30 per month are required, and the repayment period may extend up to ten years.

Nursing Student Loan Program. This program is available to 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 attain careers in nursing.

Health Professions Student Loan Program. This loan program is restricted to students in the College of Pharmacy. Loans are available to all such students with financial need.

College Work-Study Program. This federally supported program provides part-time employment during the school term and full-time employment during the vacation periods. The jobs may be either with University departments, or with off-campus, nonprofit, nonsectarian, nonpolitical agencies. Other institutionally funded employment is also available. A list of these jobs is available in the Student Financial Aid Office.

Guaranteed Student Loan Program. Students may apply for loans under the Guaranteed Student Loan Program through local lending institutions. Interest on loans, until six months after graduation, withdrawal, or drop in enrollment status to less than half time, will be paid by the federal government. The interest rate for loans made after July 1, 1988, will be 8% for the first four years of repayment and 10% thereafter.

Eligible freshman or sophomore students may borrow up to $2,625, eligible juniors and seniors may borrow up to $4,000, and eligible graduate students may borrow up to $7,500 per year. The maximum total Guaranteed Student Loan debt an undergraduate may have is $17,250. The total for graduate or professional study is $54,750, including any loans made at the undergraduate level.

Plus Loans for Higher Education and Supplemental Loans for Students (SLS). Independent undergraduates, graduate students, and parents of undergraduate dependent students may apply for loans up to $4,000 per year. A variable interest rate begins every year, but cannot exceed 12%. Additional information may be obtained from local lending institutions.

University Aid Available

University Grant. The University provides grants to over 1,000 in-state students. To be awarded a University Grant, the student must have demonstrated financial need and a satisfactory academic record.

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

T.A. Suddard International Grant. A limited number of partial tuition awards are made to international students, based on financial need. Recipients are awarded 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, class year, etc. A list of available scholarships may be found in the Appendix on page 188.

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

Regular Student Employment. Positions funded by the University are available to more than 1,000 students. Jobs are listed in the Student Financial Aid Office.

University Loans. Emergency loans ranging from $10 to $100 are available to full-time 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 upon 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 Blvd., 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.

A list of the scholarships and loans may be found on page 188. For veterans' benefits see page 19.

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."

To maintain satisfactory progress 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 (6 credits for undergraduates, 5 for graduates) for each semester that 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 equiva-

lent 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 terms 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.

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

If there are unusual circumstances which 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.

Student Life and Services

An enriching college life has a well-balanced mix of academic and extracurricular activities. The University offers a unique blend of student organizations and activities with emphasis on student-run services and businesses.

New Student Orientation

Orientation programs which facilitate the students' entry into the campus community are administered by the Dean of University College. New students who participate are taxed a nominal amount to cover such expenses as room, meals, and materials associated with their orientation program.

Summer Orientation Workshops. All 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 what to expect of the University, and to begin to acquire the skills essential to 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 receive workshop registration materials in May.

Special programs are planned for parents of new students to coincide with some of the workshop dates. Programs are also provided for older or nontraditional students and other students with special needs.

Transfer Orientation Programs. Students transferring to the University from another institution are encouraged to attend workshops planned especially to acquaint them with some of the unique features and procedures of this University. These workshops differ substantially from beginning student programs. They deal with the issues and problems associated with transferring from another educational institution to The University of Rhode Island. Orientation information and reservation materials are mailed separately to students admitted with advanced standing.

Initial Orientation for International Students. Programs just prior to the formal beginning of the academic year assist the international student to function effectively, comfortably, and with reasonable initial success in the new environment. Because successful transition to American culture, values, and institutions as well as to American academic life is crucial, new international students are required to attend the program. Full information regarding arrival dates and orientation program costs are mailed to students in the spring.

Commuter Student Orientation. A one-day program is held just prior to the start of the fall semester. This special commuter orientation is presented by the Office of Student Life and is designed to address the problems, needs, and concerns of new commuter students. Commuter orientation complements the summer orientation workshops and explores commuterrelated issues and concerns in more detail.

Minority Student Orientation. A special one-day supplemental program of information is held just prior to the start of the fall semester. Presented by Minority Student Services, minority student orientation complements the summer orientation workshops and explores minority-related issues and concerns in more detail.

Lifestyles

Residence Halls and Dining Centers. Residence halls and boarding facilities are available to students during both the regular academic year and the summer sessions. There are 19 residence halls on campus offering a variety of living accommodations including coeducational housing. Priority consideration for residence hall assignments will be given to students who have applied for admission to the University by the March 1 deadline and submitted an enrollment and housing deposit on time (May 1). All transfer students will be assigned on a space-available basis. Assignments of incoming students are made in the order in which their deposits are received. Every effort is made to honor the roommate request. For rates and contracts, see page 21.

Applications for residence hall living should be made to the Director of Residential Life.

Three dining centers offering a wide variety of food items are operated by the University for the convenience of the students. The centers were constructed with private bond funds. In order to guarantee payment of these bonds, the University requires that all students living in residence halls purchase a 10-, 15-, or 20-meal contract described on page 22. A 5-meal contract is available for nondorm students.

Fraternities and Sororities. There are approximately 1,700 fraternity and sorority members living in the 23 nationally-affiliated houses privately owned by alumni corporations. The staff of the Office of Student 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. The average room and board charge for fraternities and sororities is approximately $400 less than for University residence halls and dining centers. Approximately 100 freshmen live in fraternities and sororities each year. Interested freshmen should contact the Office of Student Life.

Commuting from Family Home. Some students commute to the University from home. The advantages of home cooking, privacy, lower costs, and opportunity to keep high school friends are balanced against numerous challenges and opportunities: acquiring information about all aspects of the University, taking advantage of evening events on campus, coping with transportation problems, and budgeting one's time. Various services are coordinated by the Office of Student Life to meet commuter needs. Dining Services offers special meal plans for commuters; Health Services provides a satellite clinic of preventive services; the Commuter Information and Referral Center, staffed by peer advisors, is a clearinghouse of information providing quick and accurate answers to any questions about University life. A car pool matching service is available in the Memorial Union Commuter Lounge.

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 often choose to move off campus and live within a ten-mile radius of the campus where summer homes are rented to students for the school year. Typically, a student will pay $100-125 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 and they patronize nearby supermarkets, laundromats, restaurants, shopping centers and recreational facilities. Many commute by car pool or bus. The Office of Student Life administers the commuter services mentioned above. The University Dining Services offers partial meal plans to commuting students for any combination of meals. Most services are located in the Commuter Lounge in the Memorial Union. An off-campus housing listing service is maintained in the Office of Residential Life.

Older Students. Approximately 800 students (10% of the undergraduate population) on the Kingston campus are over 25 years of age. There is a student organization called Older Student Association (OSA) 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 Older Students Association plans a variety of social and educational programs and provides a space in the Memorial Union for studying, taking breaks, or meeting with other students. Programs and services for this group of students are coordinated by the Office of Student Life.

Women Students. Women students make up about half of the student population. A Women's Center, administered by the Office of Student Life, provides specific resources to help women grow to their full potential, and 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.

Minority Students. Approximately 700 students use the variety of services for minority students. Black, native American, Asian, Hispanic, and other minority students have formed special interest groups to further meet their needs. A minority student center, the Uhuru SaSa House, serves as a gathering place for leisure, meetings, workshops, and various co-curricular activities. Counseling, programming, and other services are provided by the Director of Minority Student Services in the Office of Student Life.

International Students. Approximately 700 international undergraduate students, graduate students, visiting scholars, and faculty, as well as their dependents, are advised and served by the Office of International Student Services, Office of Student Life. Assistance is provided in the social, financial, housing, and immigration areas. All communications from international faculty and scholars concerning nonimmigrant visas are also handled by this office. The International Student Association and a number of national student organizations provide students with the opportunity to participate in cultural activities, and the University's

International Student Center serves as a meeting place for study, social events, and other co-curricular activities.

Students with Disabilities. Approximately 200 students have identified themselves as disabled. A full range of services is offered by the University through the Office of Student Life. Students with disabilities are encouraged to notify the Coordinator of Handicapped Services for individualized services and accommodations.

Student Government

The Student Senate ia a legislative body which represents the students to the administration and faculty and supervises extracurricular activities. It also distributes the activities tax among the various student organizations through its tax committee. Individual residence halls form their own governments. The Interfraternity Council supervises fraternity affairs and the Panhellenic Association governs sorority life. The Commuter Association provides social and other assistance to commuter students.

University Judicial System

Administered by the Office of Student Life, the University Judicial 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, *Rights and Responsibilities*. The Judicial System receives complaints or allegations from aggrieved parties, the available facts are gathered and evaluated, and the case may be referred for formal judicial action by one of the University judicial boards or by administrative action (if the student admits guilt and chooses administrative action). Sanctions range from "no further action" to suspension or dismissal from the University and may include conditions relating to the nature of the violation.

Student Activities

More than 90 student organizations are advised by the Student Activities Office staff through consultation services, technical expertise, and information. Thousands of students participate in the activities sponsored by these organizations.

Lectures and Arts Programs. Lectures and arts programs are presented throughout the year to enrich the more formal academic program of the University. Lectures of general and specialized interest are presented by visiting scholars. The URI Arts Council plans programs that include music and dance concerts, film programs, and theatre presentations. Student organizations sponsor a popular entertainment series and bring speakers of national or international prominence to campus. These are funded by student funds.

Student-run Businesses. The Student Senate business arm, called Kingston Student Services, controls and operates a variety of student-oriented businesses from a record and film shop in the Memorial Union and the campus youth hostel (primarily for commuters) to a used book exchange. Other student-controlled businesses include the fraternity and sorority cooperative buying service and the various residence hall cooperatives for purchase of food and sundry items. The Memorial Union offers a number of opportunities to run businesses under full-time supervision but with a large amount of independence. Such enterprises as the food service units, the candy and nut shop, the flower and gift shop, and the copy center all allow for management training and for excellent work experience.

Athletics. The University offers an extensive program of athletics, sufficiently varied to provide an opportunity for every student to participate. The Tootell Physical Education Center and the Keaney Gymnasium provide excellent facilities, including three pools, three gymnasiums, three weight training rooms, and a modern athletic training room. A multi-purpose indoor athletic complex is planned which will include facilities for track, tennis, gymnastics, weight training, and many other indoor activities. The outdoor facilities include the newly renovated Meade football stadium, 16 tennis courts, two softball diamonds, a baseball field, a lighted soccer field, an all-weather track, a varsity hockey field, and numerous practice fields for recreation and competitive activities.

Women's intercollegiate teams participate in Division I basketball, 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.

In addition to membership in the Atlantic Ten Conference, the University holds membership in the Yankee Conference (football), the National Collegiate Athletic Association, the Eastern College Athletic Conference, and the New England Intercollegiate Athletic Association.

Intramural programs and clubs for men and women combine the values of competitive athletics and informal sports, and are in operation all year.

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 Delta Sigma (advertising), Alpha Kappa Delta (sociology), Alpha Zeta (agriculture), Beta Alpha Psi (accounting), Beta Gamma Sigma (business), Kappa Delta Pi (education), Delta Pi Epsilon (business education), Eta Kappa Nu (electrical engineering), Lambda Kappa Sigma (women's pharmacy), Lambda Tau (medical technology), Omicron Delta Epsilon (economics), Omicron Nu (home economics), Phi Alpha Theta (history), Phi Sigma (biological science), Phi Sigma Iota (foreign languages, literature, and linguistics), Pi Delta Phi (French), Pi Mu Epsilon (mathematics), Pi Sigma Alpha (political science), Pi Tau Sigma (mechanical engineering), Psi Chi (psychology), Rho Chi (pharmacy), Sigma Delta Pi (Spanish), 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 theatre department direction, presents several plays each year. The URI Debate Council is directed by members of the speech department and participates in intercollegiate debates. The Cheerleaders are active at varsity football and basketball games and rallies

On campus there are about 30 professional organizations related to the 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 bi-weekly gazette, a yearbook, and a literary publication. Radio station WRIU, with local reception AM, and FM that reaches all of Rhode Island and parts of Connecticut and Massachusetts, is student run and operates 365 days a year.

Student Services

Career Services. The Office of Career Services helps students assess goals, develop skills, and implement career objectives. It is staffed by professional career counseling and planning specialists who provide individual counseling, noncredit workshops, career development courses, and campus interviews with a broad range of potential employers. The Career Services staff provides counseling on problems and concerns encountered during selection of college major, career search, and graduate school selection. Career Assistants, undergraduate students who serve as advisors, are available on a daily walk-in basis to help with career inquiries, resumes, job search strategies, and occupational information. Computer resources are available to aid students in self-assessment and career search.

The Career Resources Center maintains publications and information on specific careers, job openings, job search techniques, graduate programs, and employer literature. *Career Steps*, a series of publications prepared by the staff, covers selected topics and is available on request.

Counseling Services. The Counseling Center is staffed by professional counselors, psychologists, and a part-time psychiatrist. It offers short-term individual counseling and a variety of skill-building and support groups to help students cope successfully with life 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 Personal Resources Center (PRC) is located within the Center as well, and students may access self-help materials for a variety of personal concerns and psychological issues there. The Counseling Center also sponsors Perspectives, which processes student leaves of absence and counsels students who consider withdrawing from the University. In addition, it also administers professional examinations such as the Miller Analogies Test, the Graduate Record Examinations, the Law School Admissions Test, the Medical College Admission Test, and the Graduate Management Admission Test.

University Chaplains. The University chaplains are active in providing religious services, 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 Union houses a wide variety of educational, social, cultural, and recreational services and facilities. These include meeting and conference room, lounges, browsing room, study rooms, dark room, radio station, campus newspapers, games room, offices for student organizations, student technical services, flower and gift shop, candy and nut shop, cafeteria, snack bar, restaurant, private dining rooms, ballroom, and party room.

Among the services provided are a bank, travel agency, unisex hair salon, credit union, copy center, pizza shop, ice cream shop, and a scheduling and information office.

A student board of directors working with the Director of the Memorial Union and Student Activities determines policy for the Union and plans a full program of social, cultural, intellectual, and recreational activities.

Health Services. University health services include special clinics in gynecology, family planning, internal medicine, surgery, orthopedics, dermatology, psychiatry, wart removal, allergy, and nutrition, as well as generalist and nursing care, laboratory, X-ray, and pharmacy. Allergy injections are given, provided the vaccines are supplied.

Outpatient services during the academic year are available seven days a week, 24 hours a day. Physicians are available either for direct services or on call. Nurses are on duty at all times during the academic year. Specialists are available by appointment only at specified times.

Hospital care is available in the local community. All medical expenses incurred outside the University's Health Services are the responsibility of the student. Therefore, you are encouraged to have adequate insurance coverage (see Health Services brochure, *To Your Health*). Students who choose their own private physician must assume responsibility for expenses incurred.

The Health Promotion Department of Health Services in Roosevelt Hall is concerned with teaching students to take care of themselves, to adopt healthy lifestyles, and to become informed consumers of health care services.

The Learning Assistance Center. The Learning Assistance Center, located in Roosevelt Hall, assists students seeking to 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.

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 upon 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 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.

University College

Diane W. Strommer, *Dean*
Everett T. Harris, *Assistant Dean*
Sarah H. Rockett, *Academic Counselor*

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 entering students are enrolled in University College except registered nurses and students in special two-year programs. University College grants no degrees. Through its strong program of academic advising by faculty, its purpose is to assist new students in making a smooth transition to the University and to provide special assistance, progams, and events for freshmen and sophomores.

Advisors, who have regular office hours at the 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 a major. Advisors help students to select and schedule the right courses, become familiar with University procedures and programs, and obtain whatever assistance may be needed.

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

College of Arts and Sciences

Richard J. Gelles, *Dean*
John M. Grandin, *Associate Dean*
Gene J. Pollart, *Acting Associate Dean*
Caroline S. Cole, *Assistant Dean, Administration*
Joyce P. Allen, *Assistant Dean*

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 premedical, predental, prelaw, and preveterinary programs see pages 11–13.

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) electives, 3) General Education. These areas are described below.

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 on pages 31–45. Any student who has met the requirements for two separate majors within either the Bachelor of Arts or the Bachelor of Science curriculum 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 (QPA) 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 and dean, a student may 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, minimum grade point average, total credits, and the Basic Liberal Studies requirements. These may be modified only upon approval by the Scholastic Standing and Petitions Committee of the College. Petition forms are available in the Dean's Office.

2. Electives. Electives are courses not included in the General Education or major requirements which students may freely select in order to make up the total number of credits required for graduation. Many students use their elective credits to develop a minor field (see below).

Minor. Students may elect to declare a minor, which will be entered on their transcripts at graduation. Requirements for a minor may be satisfied by: 1) completion of 18 or more credits of an approved minor, or 2) completion of 18 or more credits within a curriculum other than the student's major, or 3) completion of 18 or more credits of related courses offered by more than one department, with approval by a member of the faculty competent in the minor area of study.

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 minor fields 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 grading option.

It is the responsibility of students to submit their minors to the dean for approval no later than the beginning of the second semester of their senior year.

3. General Education/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 insure that students have educational experiences which 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 which characterizes an arts and sciences education.

Basic Liberal Studies Requirements. Courses used to fulfill these requirements must be selected from the following list approved by the College of Arts and Sciences. Students may use *only two courses per discipline* (as identified by course code) to

fulfill requirements in Fine Arts and Literature, Letters, Social Sciences, and Natural Sciences.

Courses in a student's major may not be used to fulfill requirements in Fine Arts and Literature, Letters, Social Sciences, and Natural Sciences. However, if a student completes a double major, he or she may use courses from one major toward these requirements.

Courses used to fulfill Basic Liberal Studies requirements must be selected from the following list approved by the College of Arts and Sciences.

Fine Arts and Literature (A)

Fine Arts: ART 101, 103, 120, 203, 207, 215, 231, 233, 251, 252, 263, 265, 284, 285, 359, 374; HPR 101; MUS 101, 106, 111; PLS 201; SPE 231; THE 100, 181, 351, 352, 381, 382, 383.

Literature: CLA 394, 395, 396; CLS 160, 250, 335; ENG 160, 241, 242, 243, 247, 248, 251, 252, 260, 263, 264, 265, 280; FRN 327, 328, 391, 392, 393; GER 325, 326, 391, 392; ITL 325, 326, 391, 392, 395; RUS 325, 326, 391, 392; SPA 303, 306, 391, 392.

Letters (L)

APG 327; HIS 103, 105, 111, 112, 113, 114, 115, 116, 118, 122, 125, 132, 141, 142, 143, 145, 150, 171, 180, 304, 305, 306, 307, 309, 310, 311, 315, 321, 322, 323, 324, 325, 327, 332, 333, 340, 341, 342, 346, 353, 354, 381, 382, 383, 384, 398; HPR 104; NES 200; PHL 103, 104, 110, 117, 312, 314, 318, 319, 321, 322, 323, 324, 325, 328, 331, 346, 355; PLS 202; PSC 240, 341, 342; PSY 310; RLS 111, 125, 126, 131, 227; SPE 200, 205, 210.

Natural Sciences (N)

APG 201; AST 108; AVS 101; BIO 101, 102; BOT 111, CHM 100, 101, 102, 103, 105, 112, 114, 124, 191, 192; FSN 207; GEL 100, 102, 103, 105, 106; HPR 103; PHY 111, 112, 120, 130, 140, 185, 186, 213, 214, 285, 286; ZOO 111, 286.

Social Sciences (S)

APG 200, 202, 203, 220, 319; ECN 125, 126, 300, 361; EDC 102, 312; ENG 232, 330; FSN 150; GEG 100, 102, 104; HCF

Basic Liberal Studies Requirements

Basic Liberal Studies Requirements	*BACHELOR OF ARTS*	*BACHELOR OF SCIENCE* *BACHELOR OF FINE ARTS* *BACHELOR OF MUSIC*
Fine Arts and Literature*	9 credits (at least 3 in Fine Arts; at least 3 in Literature)	6 credits (3 in Fine Arts; 3 in Literature)
Letters	9 credits	6 credits
Social Sciences	9 credits	6 credits
Natural Sciences	9 credits	6 credits
Mathematics	3 credits	3 credits
Communication Skills	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 communications 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 communications courses.)
Foreign Language and Culture	*Choose one of the following options:* • Coursework through the intermediate level (104 for modern languages; 302 for classical languages). • Demonstration of competence through the intermediate level by examination. • Study abroad in an approved academic program for one semester.	*Choose one of the following options:* • 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. • 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. • Coursework in a language not previously studied (or studied for less than two years in high school) through the beginning level (102). • Study abroad in an approved academic program. • Two courses selected from *within a single culture cluster* taken, if possible, in the same or consecutive semesters. See page 9 for a list of approved culture clusters.

*Students in the Comparative Literature Studies program may fulfill the Fine Arts and Literature requirement by taking six credits in Fine Arts and three credits in Literature which are over and above their major requirement.

220; HPR 102; LIN 200, 202, 220; NRS 100; PSC 113, 116, 201, 221, 288; PSY 103, 113, 232, 235, 254; REN 105; SOC 100, 102, 204, 206, 210, 212, 214, 216, 224, 238, 240, 241, 242, 316, 330, 336; SPE 220; WMS 200.

Mathematics (M)

CSC 201; EST 220; MGS 101, 102; MTH 107, 108, 109, 111, 141, 142.

English Communication

Writing (Cw)—CMS 101; ENG 103; WRT 101, 103, 112, 122, 123, 201, 227, and 333. *General (C)*—CMS 101; PHL 101; SPE 101 and 103.

Course Load. No student may take more than 18 credits per semester without permission from the advisor and the dean.

Graduation. It is the responsibility of the student to be familiar with University and college requirements and to file for graduation by submitting a graduation worksheet, signed by his or her advisor, to the Dean's Office. Deadlines for submission are as follows:

May Graduation — November 1
August Graduation — April 1
December Graduation — August 1

Bachelor of Arts

The Bachelor of Arts curriculums provide a general cultural background and an opportunity to major in any one of 31 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 which include 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 to 30 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 30 credits. These, however, are exclusive of any credits which are outside the major department but may be required by that department as prerequisites. Including such prerequisites, the major may not exceed 36 credits.

The student may earn up to 45 credits in coursework offered by the major department, counting as electives those credits earned in excess of the major requirements. Any credits in excess of 45 earned in the major department increase correspondingly the minimum number of credits required for graduation.

Majors include: anthropology, art (history and studio), biology, chemistry, classical studies, comparative literature studies, economics, English, French, geology, German, history, Italian, journalism, Latin American studies, linguistics, marine affairs, mathematics, music, philosophy, physics, political science, psychology, Russian, sociology, Spanish, speech, theatre, urban affairs (urban social processes, policy formation, and spatial development), 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[1] credits within a department or program. 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. No more than 130 credits can be required in a program.

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

Majors include: applied quantitative economics, applied sociology, botany, chemistry, chemistry and chemical oceanography, computer science, geology, mathematics, medical technology, microbiology, physics, physics and physical oceanography, zoology.

Bachelor of Fine Arts

The 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 University 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.

Majors include: art, theatre.

Bachelor of Music

The Bachelor of Music degree is designed to prepare qualified students for careers in the field of music. Students may select one of the eight majors dependent upon their aims and abilities.

Curriculum Requirements. All candidates for the Bachelor of Music degree are required to meet the requirements of the Basic Liberal Studies Program.

Students are encouraged to attend department-sponsored events each semester.

Majors include: classical guitar, voice, piano or organ, orchestral instrument, music history and literature, theory and composition, music education.

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

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

The total number of credits for graduation is 125 (126 for music education majors).

[1]The student majoring in chemistry, for ACS accreditation purposes, will be allowed 48 credits.

Anthropology

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

Faculty: Professor Loy, *chairperson.* Professors Poggie, Pollnac, and Turnbaugh; Associate Professor Kelley; Assistant Professor Lynch.

Students desiring to major in anthropology must complete a total of 30 credits in that subject. This total must include at least one course (3 crs.) from each of the five sub-disciplines of anthropology as follows: *Cultural Anthropology* includes APG 203, 309, 321, 322, 323, 324, 326, 405, 407, and 413; *Culture Areas* includes APG 305, 311, 313, 315, 319, and 325; *Physical Anthropology* includes APG 201, 300, 301, 350, 390, 400, and 412; *Archaeology* includes APG 202, 303 and 317; *Anthropological Linguistics* includes APG 200 and 409.

In addition, each student majoring in anthropology must complete APG 401 and one of the following methodology courses: APG 300, 301, 302, 317 or 409. The remaining 9 credits may be selected from course offerings in anthropology.

It is recommended that the first course in each sub-discipline be at the 200 level. These 200-level courses are prerequisites for upper division courses in the sub-disciplines, although prerequisites may be waived by the instructor.

It is strongly recommended, but not required, that anthropology majors take at least one course in statistics.

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

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: Associate Professor Roworth, *chairperson.* Professors Calabro, Fraenkel, Kampen, Keller, Klenk, Leete, Parker, Richman, and Rohm; Associate Professors Holmes and Onorato; Assistant Professor Pagh.

BACHELOR OF ARTS

Art History. It is recommended that students intending to major in art history plan to complete a minimum of 6 credits in the history of art by the end of the sophomore year. For graduation, students must complete 30 credits (maximum 45 credits) in art history, including ART 251 and 252 (6), 354 (3), 356 (3), 359 (3), 363 (3) and 365 (3). An additional 3 credits are taken from any 200- or 300-level course in art history. An additional 6 credits must be selected on the 400-level, of which at least 3 credits must be selected from ART 461, 462, or 480. Studio courses in art are not to be considered part of the art history major and may be used as free electives.

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 as electives. Of the 120 credits required for graduation, 42 credits must be numbered 300 or above.

Art Studio. It is recommended that students intending to major in art studio plan to complete a minimum of 9 credits in studio by the end of the sophomore year. For graduation, a minimum of 30 credits in art (maximum 45 credits) must be completed, including: studio courses ART 101, 103, 207, 405, and 406; art history courses ART 251, 252, and one art history elective.

An additional 6 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.

It is recommended that art majors elect at least 3 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 9 credits in art history. Students may use additional courses in art history as electives. Of the 120 credits required for graduation, 42 credits must be 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 ART 120 in the freshman year and to have completed an additional 3 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.

ART 120 is required of all students and an additional 9 credits must be selected in art history, 3 credits of which must be numbered 300 or above.

An additional 6 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), 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 Departments of Botany, Microbiology, and Zoology. A student may earn either the Bachelor of Arts (B.A.) degree in biology or the Bachelor of Science (B.S.) degree in botany, microbiology, or zoology. The Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) degrees, also offered by these departments, are described in the *Graduate School Bulletin.*

Botany Faculty: Professor Sheath, *chairperson (on leave spring 1989).* Professors Albert, Beckman, Goos, Harlin, Hauke, Smayda, and Swift; Associate Professors Hargraves, Killingbeck, Koske, and Mottinger; Assistant Professor Norris; Adjunct Professor Steele; Adjunct Assistant Professors Peckol and Thursby; Emeriti Professors Caroselli, Lepper, and Palmatier.

Microbiology Faculty: Professor Laux, *chairperson.* Professors Cabelli, P.S. Cohen, H.W. Fisher, Hufnagel, Sieburth, Traxler, and N.P. Wood; Associate Professors Nelson and Sperry; Emeritus Professor Carpenter.

Zoology Faculty: Professor Cobb, *chairperson.* Professors Costantino, Goertemiller, Hammen, Heppner, Hill (on leave spring 1989), K.E. Hyland, Saila, Shoop, and Winn; Associate Professors Bibb, Bullock, Goldsmith, Kass, Krueger, Mottinger, and Specker; Assistant Professor Twombly; Adjunct Professors Gibbs, Lions, Mather, Miller, and Turner; Emeriti Professors DeWolf, Harrison, Wilde, and Zinn; Emeritus Associate Professor Mathewson.

BACHELOR OF ARTS

Students selecting a major in biology must complete a minimum of 28 credits in biological sciences including the following basic courses: BIO 101 and 102 or BOT 111 and ZOO 111 (6-8), MIC 211 (4), plus BOT electives (6), and ZOO electives (6).

The remaining 4–6 credits may be selected from courses in botany, microbiology, or zoology. Students in this major must elect a year of chemistry. Those wishing to prepare for a professional career in the life sciences should enroll in a bachelor of science curriculum described below.

Students must declare their major when leaving University College.

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 specialization in the fundamental principles of botany, microbiology, or zoology, 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 biology, molecular, cellular and developmental biology, biological oceanography, genetics, immunology, and limnology, and for admission to professional schools of medicine, dentistry, and veterinary medicine.

Students who know their professional goals are encouraged to declare their major as soon as possible in order to take advantage of skilled advising in botany, microbiology, or zoology. Students *must* declare their major when leaving University College.

Each concentration requires a total of 130 credits.

Freshman Year
First semester: 17 credits

BOT 111 or ZOO 111 (4), CHM 101, 102 or 103, 105 (4), MTH 109 or 141 (3), modern language or elective (3), and general education requirement or free elective (3).

Freshman Year
Second semester: 17 credits

BOT 111 or ZOO 111 (4), CHM 112, 114 (4), MTH 141 or 142[2] (3), modern language or elective (3), and general education requirement or free elective (3).

Sophomore Year
First semester: 16 credits

MIC 211 (4)[3], CHM 227 (3), and 9 credits of general education requirements or free electives[4] for a total of 17 credits.

Sophomore Year
Second semester: 17-18 credits

Curriculum requirement (3-4), general education requirements or free electives (9), and the remaining chemistry requirements CHM 226[5], 228 (5).

Botany. A minimum of 30 credits in botany is required and must include BOT 111, 221, 245, 262. The remaining 17 credits will be selected to complete a particular subdisciplinary path. In addition, the student must take MIC 211; CHM 101, 102, or 103, 105, 112, 114, 226[5], 227, 228 or 124, 126 and BCP 311; PHY 213, 285, 214, 286 or 111 and 112; ZOO 111; WRT 101; SPE 101; MTH 141; CSC 201 or MTH 142; a modern language is recommended.

Students are strongly urged to consult faculty advisors to obtain guidance on the various subdisciplinary paths available.

Microbiology. A minimum of 30 credits in microbiology is required, including MIC 333, 413, 414, 415, 416, and 495 or 496, and one course selected from MIC 412, 422, 432, or 576. The student majoring in microbiology may include any course in microbiology; BOT 465, 432, 534, 542; PCG 536; ZOO 327, 331, 341 and 512. A student who plans to attend graduate school is advised to take MTH 141 and 142, and BCP 435. In addition the student must take BOT 111 and 352; ZOO 111; CHM 101, 102, or 103, 105, 112, 114, 226[6], 227, 228, and 212; BCP 311; PHY 213, 285, 214, and 286 or 111, 185, 112, and 186; and MTH 141 and one semester from the following: MTH 109, 111, 142, CSC 201 or EST 407.

Zoology. A minimum of 30 credits in zoology is required and must include ZOO 221, 254, 260 or 262, 316, 341 or 345 and 395; ASP or BOT 352. In addition, the student must take BOT 111; CHM 101, 102 or 103, 105; CHM 112, 114, 226[5], 227, 228; MTH 141, 142; PHY 111, 185, 112 and 186 or PHY 213, 285, 214, 286; and a modern language through the intermediate level. ZOO 111 is not required for a major in zoology but may be applied toward the 30 hours required. Students are encouraged to become involved in the department's varied research activities. Major or elective credit is available to qualified students.

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

Chemistry

The Department of Chemistry offers a Bachelor of Arts (B.A.) degree and a Bachelor of Science (B.S.) degree. The Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) degrees in chemistry are described in the *Graduate School Bulletin.*

Faculty: Professor Fasching, *chairperson.* Professors Abell, C.W. Brown, P.R. Brown, Cheer, Freeman, Goodman, Kirschenbaum, W.H. Nelson, Rosen, Rosie, and Vittimberga; Associate Professors Euler, Force, and Yang; Assistant Professor Peterson.

BACHELOR OF ARTS

Students selecting this field must complete a minimum of 29 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, 431, 432, and 355. One addi-

[2]MTH 142 is required of zoology and is an optional requirement for botany majors.

[3]Not required of zoology majors.

[4]Botany and zoology majors are strongly advised to begin taking required major courses at this time.

[5]CHM 229, 230, which is offered in summer only, may be substituted for CHM 226.

[6]Students can take CHM 101(2), CHM 112(4), and 212 instead of 191-192.

tional course must be chosen from 401, 412, or 427. CHM 226, 227, 228 may be substituted for the 291, 292 sequence.

MTH 141 and 142, one year of physics (PHY 213, 214, 285, and 286, or PHY 111, 112, 185, and 186) are required and one semester of English composition (WRT 101 or 102) is strongly recommended.

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 theories and practices in the fields of analytical, physical, organic and inorganic chemistry. Those who complete this curriculum are prepared to continue with graduate study leading to an advanced degree, to teach or to enter specialized fields in development, control, technical sales, and research either in the chemical industry or in industries involving chemical processes.

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 102 be taken in the freshman year. CHM 425, 427 should be taken in the junior year by students planning research or advanced coursework in organic chemistry.

The bachelor of science program requires 130 credits.

This sample program can easily be adapted for transfer students and premed, prevet programs.

Freshman Year
First semester: 17 credits

CHM 191 (5)[6], MTH 141 (3), language[7] or free elective (3), general education electives (6).

Freshman Year
Second semester: 17 credits

CHM 192 (5)[6], MTH 142 (3), language[7] or free elective (3), general education electives (6).

Sophomore Year
First semester: 17 credits

CHM 291 (4), MTH 243 (3), PHY 213 (3) and 285 (1), language[7] or general education elective (3), general education elective (3).

Sophomore Year
Second semester: 17 credits

CHM 292 (4), MTH 244 (3), PHY 214 (3) and 286 (1), language[7] or general education elective (3), general education elective (3).

Junior Year[8]
First semester: 14 credits

CHM 431 (3), 335 (2), physics elective (3), general education elective (3), free elective (3).

Junior Year
Second semester: 17 credits

CHM 432 (3), 412 (3), 414 (2), general education electives (6), free electives (3).

Senior Year
First semester: 16 credits

CHM 401 (3), 425 (2), 427 (3), curriculum[9] requirements (3-5), free electives (5-3).

Senior Year
Second semester: 15 credits

CHM 392 (1), 402 (2), curriculum[9] requirement (3-0), free electives (8-11).

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 James L. Fasching (Chemistry). The faculty consist 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 101A or WRT 101B be taken in the freshman year.

A total of 130 credits is required for graduation.

Freshman Year
First semester: 17 credits

CHM 191 (5)[6], MTH 141 (3), language[7] or free elective (3), general education electives (6).

Freshman Year
Second semester: 17 credits

CHM 192 (5)[6], MTH 142 (3), language[7] or free elective (3), general education electives (6).

Sophomore Year
First semester: 17 credits

CHM 291 (4), MTH 243 (3), PHY 213 (3) and 285 (1), language[7] or general education elective (3), general education elective (3).

Sophomore Year
Second semester: 17 credits

CHM 292 (4), MTH 244 (3), PHY 214 (3) and 286 (1), language[7] or general education elective (3), general education elective (3).

Junior Year
First semester: 14 credits

CHM 431 (3), 335 (2), OCG 501 (3), general education elective (3), free elective (3).

Junior Year
Second semester: 15 credits

CHM 432 (3), OCG 521 (3), general education electives (6), free electives (3).

Senior Year
First semester: 16 credits

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

Senior Year
Second semester: 17 credits

CHM 412 (3), 414 (2), OCG 494 (3), free electives (9).

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[6]Students can take CHM 101(2), CHM 112(4), and 212 instead of 191-192.

[7]Students planning to attend graduate school should take Russian or German through the intermediate level.

[8]See comments above concerning CHM 425, 427.

[9]CHM 353, 354 or, with permission of department, any 500-level chemistry course.

Classical Studies

The Department of Languages offers the Bachelor of Arts (B.A.) degree with a concentration in classical studies.

Faculty: Professor Dornberg, *chairperson* (Department of Languages).

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) 6 credits from the other language at any level; (c) 6 additional credits from any courses offered by the Classics Section. Either LAT 101, 102 or 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.

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 Languages offer jointly the Bachelor of Arts (B.A.) degree in comparative literature. The Master of Arts (M.A.) degree is described in the *Graduate School Bulletin.*

Coordinator: Associate Professor Dvorak (English)

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 the Comparative Literature Advisory Committee consisting of members from the Departments of English and Languages.

Students in the Comparative Literature Studies fulfill the Fine Arts and Literature requirement by taking 6 credits in Fine Arts and 3 credits in Literature which are over and above their major requirement.

Students must complete a minimum of 30 credits in one of the three major options:

English and one foreign literature in the original language. 9 credits in English and/or American literature, 300 level or above; 9 credits in one foreign literature; 3 credits in literary theory or criticism (CLS 350). The remaining credits to be taken from the comparative literature core courses or the literature courses in the Departments of English or Languages.

Two foreign literatures in the original language. 9 credits in each of two foreign literatures; 3 credits in literary theory or criticism (CLS 350). The remaining courses to be taken from the comparative literature core courses or the literature courses in the Departments of English or Languages.

World literature in English translation. 3 credits in the nature of language from APG 200, 409; LIN 201, 202; or PHL 440; 3 credits in literary theory or criticism (CLS 350). The remaining credits to be taken from the comparative literature core courses and the literature courses in the Department of English, and the literature in English translation courses offered by the Departments of English and Languages. In addition, a student choosing this option must have proficiency in a foreign language through the intermediate level.

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

Computer Science and Statistics

The Department of Computer Science and Statistics offers the Bachelor of Science (B.S.) degree in computer science. The Master of Science (M.S.) degree programs in computer science or statistics and the Doctor of Philosophy (Ph.D.) in applied mathematical sciences with specialization in computer science or statistics are described in the *Graduate School Bulletin.*

Faculty: Associate Professor Lamagna, *chairperson.* Professors Carney, Hanumara, and Heltshe; Associate Professors Baudet, Carrano, Lawing, and Soh; Assistant Professors Peck, Kohlbecker, and Ravi Kumar; Adjunct Associate Professor Arnold. Emeriti Professors Hemmerle, Merenda, and L.T. Smith.

The curriculum is designed to provide a broad introduction to computer science fundamentals. Emphasis is on computer software and applications. The required mathematics preparation provides a basis for advanced work. Students will be well prepared for graduate study in computer science or computer-related areas.

A registration priority is in effect for all computer science courses. Preference is given to computer science majors, followed by students whose curriculum requires computer science, followed by all others. Students who have preregistered for computer science courses will be given preference, within the above constraints, regardless of their curriculum. Therefore, preregistration is strongly recommended.

Students in this curriculum must complete a minimum of 39 credits in the major as follows:

CSC 201 (3), 202 (3), 340 (3), 301 (3), 311 (3), 431 (3); also 21 additional credits chosen from EST 409, ELE 405 and any CSC course at the 300 level or above (excluding special topics and directed study).

In addition, 12 credits of professional electives are required. The courses must be selected from a list which is available from the department.

Also required are MTH 141 (3), 142 (3), 215 (3), 243 (3); one SPE course (3) and one WRT course (3) or CMS 101 (6).

A total of 130 credits is required for graduation. A possible course of studies follows:

First Year
First semester: 15 credits

MTH 141 (3), WRT 101 (3), general education or electives (9).

First Year
Second semester: 15 credits

CSC 201 (3), MTH 142 (3), SPE 101 (3), general education or electives (6).

Second Year
First semester: 15 credits

CSC 202 (3), MTH 243 (3), general education or electives (9).

Second Year
Second semester: 15 credits

CSC 301 (3), 340 (3), MTH 215 (3), general education or electives (6).

Third Year
First semester: 18 credits

CSC 311 (3), major (6) (e.g. CSC 302, 320, EST 409), professional electives (3), general education or electives (6).

Third Year
Second semester: 17 credits

Major (6) (e.g. CSC 350, 406, 411), professional electives (3), general education or electives (8).

Fourth Year
First semester: 18 credits

CSC 431 (3), major (3) (e.g. CSC 416, 447), professional electives (3), general education or electives (9).

Fourth Year
Second semester: 17 credits

Major (6) (e.g. CSC 412, ELE 405), professional electives (3), general education or electives (8).

Economics

The Department of Economics offers a Bachelor of Arts (B.A.) degree in economics and a Bachelor of Science (B.S.) degree in applied quantitative economics. The Master of Arts (M.A.) in economics is described in the *Graduate School Bulletin.*

Faculty: Professor Rayack, *acting chairperson.* Professors Barnett and Hellman; Associate Professors Burkett, Lardaro, Mead, Ramsay, Ramstad, Starkey, and Suzawa; Assistant Professors Latos and Miller.

BACHELOR OF ARTS

Students selecting this field must complete a minimum of 30 credits in economics, including ECN 125 and 126 (6), 361 (3), 327, 328 (6), and at least one quantitative course—374 (3), 375 (3), 376 (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—MGS 201 (3), 202 (3), EST 408 (3), 409 (3), or 412 (3)—and three credits from another related course approved by the department chairperson.

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 IN APPLIED QUANTITATIVE ECONOMICS

Students selecting this field must complete a minimum of 30 credits in economics, including ECN 125 and 126 (6), 323 and 324 (6), 361 (3), 376 (3), 444 (3), and at least 6 credits selected from 400- and 500-level courses.

In addition, students in this curriculum must complete the following courses outside the department: MTH 141, 142, 215 (9); EST 409 (3) or MGS 201 and 202 with a grade of B or better; CSC 201 (3); SPE 101 (3); and WRT 333 (3).

A total of 120 credits is required for graduation.

English

The Department of English offers a Bachelor of Arts (B.A.) degree. The Master of Arts (M.A.) and Doctor of Philosophy (Ph.D.) programs in English are described in the *Graduate School Bulletin.*

The Department of English offers jointly with the Languages Department the Bachelor of Arts degree in comparative literature studies (see p. 35).

Faculty: Associate Professor Reaves, *chairperson.* Professors Campbell, Donnelly, Goldman, Kunz, MacLaine, J.M. Marshall, Mathews, Neuse, Pearlman, Petrie, Potter, Seigel, Stineback, Towers and S. White; Associate Professors Arakelian, Barker, Cane, Cuddy, Dvorak, M. Hills, Jacobs, Leo, Malina, Martin, McCabe, C.M. Murphy, Schoonover, Schwegler, Shamoon, K. Stein, Swan, R.H. Tutt and R.M. Tutt; Assistant Professors Badejo, Burke, Mensel, and Vaughn; Adjunct Professor Strommer.

Students selecting this field must complete a minimum of 30 credits in English, including ENG 251 and 252.

The other remaining credits will be determined by the student in continuing consultation with the departmental advisors.

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

French

The Department of Languages offers the Bachelor of Arts (B.A.) degree with a concentration in French. The Master of Arts (M.A.) program in French is decribed in the *Graduate School Bulletin.*

Faculty: Professor Chartier, *section head.* Professors Rogers, Rothschild, and Waters; Associate Professors Hyland, Kuhn, Morello, and Toloudis; Assistant Professor Driver.

Students selecting this field are required to complete at least 30 credits in French not including FRN 101, 102, 131, 391, 392, 393, or 394. They may elect either a language-civilization option requiring 6 credits in civilization and a minimum of 6 credits in literature or a language-literature option with a minimum of 9 credits in literature. Courses in literature may be selected from among FRN 327, 328, courses at the 400 level, and, with permission of the instructor, courses at the 500 level.

Additionally, students of proven competence in French language and literature, with permission of the advisor, the section head, the department chairperson and the dean of the college, may take courses in related fields such as history, linguistics, art, or philosophy toward their concentration.

Students in secondary education with an academic sequence in French (see page 66) cannot count FRN 101, 102, 131, 391, 392, 393, 394, or any course in linguistics other than 201 which may be taken if approved by the French Studies Section.

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

Geography and Marine Affairs

See Marine Affairs on page 38.

Geology

The Department of Geology offers a Bachelor of Arts (B.A.) degree and a Bachelor of Science (B.S.) degree. The Master of Science (M.S.) degree in geology is described in the *Graduate School Bulletin.*

Faculty: Professor J.C. Boothroyd, *chairperson.* Professors Cain and Hermes; Associate Professor Frohlich; Assistant Professors Fastovsky and Murray.

BACHELOR OF ARTS

Students selecting this field must complete a minimum of 30 credits in geology, including GEL 103 (3), 106 (1), and 488 (3). GEL 105 normally may not be included.

The B.A. curriculum provides more flexibility than the B.S. program in the choice of courses and offers the possibility of highly individualized programs in consultation with the faculty advisor.

The B.A. curriculum can provide an appropriate background for geology-related fields dealing with natural resources, environmental studies, conservation, resource management, and others. Students intending to pursue graduate studies in the geosciences should consider the B.S. curriculum in geology or complement the B.A. program with a broad background in basic sciences. The federal government identifies GEL 320, 321, 370, 410, 440, 450, and supporting sciences as a minimum background for geologists.

Students interested in earth science teaching should contact the Department of Geology for details of a cooperative program with the Department of Education.

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 is designed as a basic foundation for careers in the earth sciences. It offers preparation for further work in areas such as sedimentology, coastal geology, igneous and metamorphic petrology, geochemistry, structural geology, tectonics, geophysics, paleontology, paleoecology, geohydrology, remote sensing, mineral and energy resources, engineering geology, environmental geology, and oceanography.

An emphasis on marine geology is possible by taking, in addition to marine-oriented geology courses, approved geology-related courses offered by the Graduate School of Oceanography and the Department of Ocean Engineering as science electives. Information about this and other similar options can be obtained from the chairperson of the department.

Students majoring in geology should note the requirement for field experience. An approved summer field camp for a minimum of 4 credits normally is undertaken following the junior year, and related costs are the responsibility of the student. Minimum background for field camp normally includes GEL 320, 321, 370 and 450. (Field camp is not required under the B.A. curriculum.)

A total of 126 credits is required for graduation. Following is the suggested sequence of courses for the first four semesters. Completion of these courses fulfills the Natural Sciences and Mathematics Division requirements and satisfies prerequisites for upper-division geology courses. Late concentrators, transfer students, and others wishing to modify this schedule should consult their geology faculty advisor.

Freshman Year
First semester: 16-17 credits

GEL 103 (3), 106 (1), BOT 111 or BIO 101 (4-3), CHM 101, 102 or 103, 105 (4), and general education requirements (6).

Freshman Year
Second semester: 16-17 credits

Science elective (3) [GEL 100 or 102 suggested], CHM 112, 114 (4), ZOO 111 or BIO 102 (4-3), MTH 111 (3) if needed for background, and general education requirements (3-6).

Sophomore Year
First semester: 14-17 credits

GEL 320 (4), PHY 213, 285, or 111, 185 (4), MTH 141 (3) or general education requirement or elective (3-6).

Sophomore Year
Second semester: 15 credits

GEL 321 (4) and 370 (4), PHY 214, 286 or 112, 186 (4), MTH 142 (3).

Junior and Senior Years

The following 4-credit courses are required: GEL 410, 440, 450, 488, and an approved summer field camp (between junior and senior years). GEL 488 is designed to be taken in the final semester (spring of senior year).

Students must also take CSC 201 and 12 credits of science electives (including additional geology courses) which constitute an integrated group in earth science. These are selected in consultation with the faculty advisor. Undergraduates may take 500-level geology courses but they should note the prerequisites and the alternate-year schedule.

The remainder of the general education requirements and free electives are also taken at this time.

German

The Department of Languages offers the Bachelor of Arts (B.A.) degree with a major in German.

Faculty: Professor Dornberg, *section head.* Professor Grandin; Assistant Professor Crossgrove.

Students selecting this major complete at least 30 credits in German (27 credits for major in secondary education) not including GER 101, 102, 391, 392, or 393. At least 6 credits must be at the 400 level in literature.

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 Master of Arts (M.A.) program in history is described in the *Graduate School Bulletin.*

Faculty: Professor Cohen, *chairperson.* Professors Briggs, Costigliola, Findlay, Gutchen, Kim, Klein, Strom, Thurston, and Weisbord; Assistant Professors Daniel, Diaz-Miranda, Honhart, Marmon, Murphy, and Silvestri; Adjunct Associate Professor Klyberg.

Students selecting this field must complete a minimum of 30 credits in history, including a minimum of 6 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 one undergraduate seminar, HIS 395. Under unusual circumstances, with permission of the chairperson of the department, 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 department.

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 Languages offers the Bachelor of Arts (B.A.) degree with a major in Italian.

Faculty: Professor Trivelli, *section head.* Professor Viglionese; Assistant Professor Sillanpoa.

Students selecting this field complete at least 30 credits in Italian (27 credits for major in secondary education) not including ITL 101, 102, 391, 392, 393, or 395. ITL 325, 326 are required for the major.

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: Professor Campbell, *acting chairperson.*

Students selecting this major must complete a minimum of 30 credits in the print or broadcast journalism sequence, including JOR 110 (3), 212 (3), 312 (3), 434 (3), 438 (3). The print sequence requires *two* of the following: JOR 324 (3), 325 (3), 326 (3); the broadcast sequence requires JOR 271 (3) and JOR 372 (3). Students may elect to include both the print as well as the broadcast sequence as part of their journalism studies.

All students must take at least 9 more credits in courses (to meet the minimum of 30 credits) offered by the Journalism Department, not more than 6 of which may be in internships. All journalism students are required to type and to show evidence of writing competency. Students are urged to pursue either a minor field of study (outside of the Journalism Department) or a double major.

The Department of Journalism has also developed a minor in public relations, in conjunction with the Marketing and Speech departments.

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

Languages

The Department of Languages offers the Bachelor of Arts (B.A.) degree in classical studies, French, German, Italian, Linguistics, Russian, and Spanish, which are described in alphabetical order, as well as courses in Portuguese.

Faculty: Professor Dornberg, *chairperson.*

The Department of Languages offers jointly with the English Department the Bachelor of Arts degree in comparative literature studies (see page 35).

Latin American Studies

The Departments of Sociology and Anthropology, History, and Languages offer a Bachelor of Arts (B.A.) degree 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; 6 credits in Spanish or Portuguese from the approved list, LAS 397, PSC 201, ECN 363, and 9 credits of electives from approved list of courses.

Credits leading to the B.A. in Latin American Studies may also be taken at foreign universities or other universities in the U.S. having Latin American Studies programs with the approval of the Latin American Studies Committee.

A list of required and suggested courses acceptable for this program can be found on page 117. 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 chairperson is Thomas Morin, associate professor of Hispanic studies in the Department of Languages.

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

Linguistics

The Department of Languages offers the Bachelor of Arts (B.A.) degree with a major in linguistics.

Faculty: Professor Rogers, *section head.*

Students selecting this field must complete a minimum of 27 credits, as follows: at least 12 credits from LIN 201, 202, 302, 330, 402, 497, 498; and the remaining credits necessary to complete the minimum requirement from APG 200, 409; ENG 330, 332, 430, 530, 536; FRN 503; GER 409; ITL 408; LIN 414; PHL 440; SPA 409; CMD 373, 375; SPE 410.

They must also attain competence in at least one language other than English equivalent to the terminal level of 206.

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

Marine Affairs

The Department of Marine Affairs offers a Bachelor of Arts (B.A.) degree. The Master of Marine Affairs (M.M.A.) and Master of Arts in Marine Affairs (M.A.M.A.) programs are described in the *Graduate School Bulletin.*

Faculty: Professor Juda, *chairperson.* Professors Alexander and Michel; Associate Professors Marti, Nixon, and West; Assistant Professors Burroughs and Krausse.

Students selecting this field are required to complete at least 30 credits in marine affairs in accordance with the following distribution:

All of the following courses (12 credits): MAF 100, 120, 410, 482.

One of the following courses (3 credits): MAF 220, 221.

Five of the following courses (15 credits): MAF 312, 315, 320, 330, 413, 456, 461, 471, 499.

In addition to the above marine affairs requirements, students must also take REN 105 and OCG 410.

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

Students in other New England states may enroll in Marine Affairs under the New England Regional Student Program. See details on page 18.

Mathematics

The Department of Mathematics offers a Bachelor of Arts (B.A.) degree and a Bachelor of Science (B.S.) degree. The Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) degrees in mathematics are described in the *Graduate School Bulletin.*

Faculty: Professor Montgomery, *chairperson.* Professors Beauregard, Datta, Driver, Fraleigh, Grove, Ladas, Lewis, P.T. Liu, Roxin, Schwartzman, Sine, Shisha, Suryanarayan, and Verma; Associate Professors Clark, Finizio, Kaskosz, and Pakula; Assistant Professor Barron; Associate Professor Emeritus R. Caldwell.

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 30 credits in mathematics, and include

MTH 141 (3), 142 (3), 215 (3), and 243 (3) as well as two courses at the 400 level.

MTH 107, 108, and 109 are not open to students majoring in mathematics.

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

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 109 may not be included. The student must take PHY 213, 285 (which may be counted toward the student's general education requirements) and PHY 214, 286. CSC 201 and 202 are recommended.

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 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 435-436 or 437-438, and also CSC 201-202. In addition, the student must select 9 credits from Group I (Mathematics), and 9 credits from Group II (Applications).

Group I: MTH 143, 244, 316, 418, 441, 444, 451, 452, 461, 462, 471, 472, and any MTH course having one of these as a prerequisite.

Group II: CSC 311, 340, 350, 411, 413; ELE 210; EST 409, 412; IME 432, 433; MCE 162, 263; MGS 445, 465, 466, 475; PHY 213-285, 214-286, 322, 331, 341; ZOO 460. Other courses may be used for this group with prior permission of the department.

Both programs require 130 credits for graduation.

Medical Technology

The medical technology curriculum is administered by the Microbiology Department and offers a Bachelor of Science (B.S.) degree in medical technology. The Master of Science (M.S.) degree in clinical laboratory sciences is described in the *Graduate School Bulletin.*

Faculty: Professor Laux, *chairperson;* Gregory Paquette, *coordinator.* Adjunct Clinical Professors Allegra, Lee, Nayak, and Micolonghi; Adjunct Clinical Associate Professors Kessiman, Roberti, and Schwartz; Adjunct Clinical Assistant Professors Campbell, Gmuer, Heelan, Howard, Mello, and Singh.

During the first three years, the emphasis is on general education and basic courses in biology, chemistry, mathematics, and physics necessary as background in the applied sciences. The courses of the senior year are taught off campus by the staffs 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 soon after the completion of the third year of the curriculum, in late July. It is taken at one of the following hospitals which are about 30 miles from the main campus of the University: Rhode Island Hospital, St. Joseph Hospital, which are in Providence; the Memorial Hospital of Rhode Island in Pawtucket; or the Rhode Island Medical Center in Cranston. The clinical program includes lecture and laboratory instruction in the various areas of clinical laboratory science 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 for the first two years. Students are selected by the University Committee on Medical Technology 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 director 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, zoology, 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 credits

CHM 101, 102 or CHM 103, 105 (4), BOT 111 or ZOO 111 (4), MTH 109, 111, or 141 (3), and general education requirements[10] (3).

Freshman Year
Second semester: 15 credits

CHM 112, 114 (4), ZOO 111 or BOT 111 (4), CSC 201 (3), MTC 102 (1), and general education requirements (3).

Sophomore Year
First semester: 17 credits

CHM 227 (3), PHY 111, 185 (4), MIC 211 (4), and general education requirements (6).

Sophomore Year
Second semester: 17 credits

CHM 228, 226 (5), MTC 202 (3), ZOO 242 (3), and general education requirements (6).

Junior Year
First semester: 18 credits

MIC 333 (3), MTC 483 (3), EDC 102 or 312 (3), and general education requirements (9).

Junior Year
Second semester: 17 credits

MIC 432 (3), BCP 311 (3), EST 407 or 408 (3), MGT 300 or 301 (3), and electives (5).

Senior Year
First semester: 16 credits

MTC 401 (8), 403 (4), 405 (2), and 407 (2).

Senior Year
Second semester: 16 credits

MTC 402 (8), 404 (6), and 406 (2).

[10]Language 101 and 102 are required if student enters without this equivalent.

Military Science (ROTC)

The Department of Military Science conducts the Reserve Officer Training Corps program for students who desire to earn a commission as officers in the Army of the United States. Students must complete the equivalent of eight semesters of military science subjects. Participation in the program during the first two years (freshman/sophomore) is without any obligation to the military. Upon completion of University degree requirements and departmental requirements, students are commissioned as Second Lieutenants in the Army of the United States in either the Active Army, Army Reserve, or National Guard.

Faculty: Professor Davis, *chairperson.* Assistant Professors Lawson, LeNoir, Lexvold, and Nichols.

Music

The Department of Music offers a Bachelor of Arts (B.A.) degree and a Bachelor of Music (B.Mus.) degree. The Master of Music (M.M.) degree is described in the *Graduate School Bulletin.*

Faculty: Professor Keeling, *chairperson.* Professors J.S. Ceo, Dempsey, Fuchs, Gibbs, Kent, Pollart, and Rankin; Associate Professor Langdon; Assistant Professors Ladewig and Livingston; Special Instructor Ergas; Artist Instructors Buttery, J.H. Ceo, Cobb, Dean, Eldredge, Fraioli, Hieken, LaFitte, Marinaccio, Sparks, Stabile, Swanson, Trexler, Weaver, and Wieditz.

BACHELOR OF ARTS

Students selecting music as a major will complete 32 credits as follows: MUS 113, 114 (8), 215, 216 (6), 221, 222 (6), 251 (6), 317 (3), and upper division music history and literature (3).

The equivalent of MUS 101 is required as a prerequisite to MUS 221, 222. This may be met either by a placement examination or by taking the course as an elective. Transfer credits in music theory and performance must be validated by placement examination.

To conform with the requirements of the National Association of Schools of Music of which the department is a member, it is strongly recommended that at least 6 and up to 15 elective credits be taken in upper-level music courses. An audition is required for the study of performance.

A total of 120 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 by audition and should contact the music department for specific requirements.

All students in this degree program must take the following music courses: MUS 113, 114 (8), 172 (1), 215, 216 (6), 221, 222 (6), 250 (0), and 317 (3) for a total of 24 credits. Students may meet the requirement of MUS 172 by passing the piano proficiency examination before the accumulation of 60 credits. Students who have not passed the piano proficiency examination by the end of MUS 172 will be expected to take MUS 181, 182 as needed. Seven semesters of MUS 250 are required of all Bachelor of Music students.

All students except guitar performance majors are expected to enroll in one of the following ensembles each semester: MUS 290, 291, 293, 294, 295, 390. No student should participate in more than three ensembles of any kind in a single semester.

The equivalent of MUS 101 is required as a prerequisite to MUS 221, 222. This may be met either by a placement examination or by taking the course as an elective. Transfer credits in music theory and performance must be validated by placement examination.

All bachelor of music students will take the piano proficiency examination at the conclusion of one year of study or by the end of the second semester of the sophomore year. Failure to pass the proficiency examination or any portion of it requires reexamination in succeeding semesters. No one will graduate with a Bachelor of Music degree until this requirement is fulfilled.

In addition, each student selects one of the following majors.

A total of 125 credits is required for graduation (126 for music education).

Classical Guitar. Students selecting classical guitar must complete MUS 261 (12), 312 (2), 293 or 295 (4), 299H (4), 420 (3), 441-tablature (3), 461 (16), 465 (0), and upper division music history/ literature (3).

Voice. Students selecting voice must complete MUS 261 (12), 242 (8), 311 (2), 293 or 295 (8), 461 (16), 465 (0), and upper division music history (3).

Students majoring in voice must also take 15 credit hours of foreign language in any three or more languages at any level. The requirement may be modified or satisfied by advanced placement.

Piano or Organ. Students selecting piano or organ must complete MUS 261 (12), 293 or 295 (2), 299A or 390 (6), 420 (3), 461 (16), 465 (0), and upper division music history/literature (3 or 4).

Orchestral Instrument. Students selecting orchestral instrument must complete MUS 261 (12), 312 (2), 321 (3), 290, 291, or 294 (8), 293 or 295 (2), 299 (2), 420 (3), 461 (16), 465 (0), and upper division music history/literature (3).

Music History and Literature. Students selecting music history and literature must complete MUS 251 (8), 290, 291, 293, 294, 295, or 390 (6), 293 or 295 (2), 407 (3), 408 (3), 420 (3), 430 (3), 431 (3), 432 (3), 433 (3), 434 (3), 441 (3-6) and 451 (8).

Students concentrating in music history and literature must take 9 credits of foreign language and must have proficiency through 104 in either French or German.

Music Theory and Composition. Students selecting music theory and composition must complete MUS 251 (8), 241 or 173, 175, 177, 179, and 4 elective credits for piano majors (8), 321 (3), 290, 291, 293, 294, 295 or 390 (6), 293 or 295 (2), 418 (3), 420 (3), 423 (3), 441 (3), 451 (8), and upper division music history/literature (3 or 4).

Students majoring in composition must take MUS 117, 419, and 422.

Music Education. Students majoring in music education must complete the following:

For all students: MUS 171, *pianists exempt* (1), 251 (8), 311, 312 (4), 321 (3), 339 (3), 340 (3), 451 (4), 455 (0), EDC 102 (3)[11], 312 (3), and 484 (6).

[11]EDC 102 may also be counted toward the social sciences requirement in the Basic Liberal Studies Program.

In addition, students must select one of the following options:

For general preparation: MUS 173, 174 *vocalists exempt* (2), 169, 170, 175, 176, 177, 178, 179, 180 (8)[12], 290, 291 or 294 (2), 293 or 295 (2), and 4 additional credits selected from 290, 291, 293, 294, 295, or 390 (4).

For vocal specialization: MUS 170 *guitarists exempt* (1), 173, 174 *vocalists exempt* (2), 181, 182 *pianists exempt* (2), 242 *pianists exempt* (2), and 293 or 295 (8). Up to 4 credits of MUS 390 may be substituted for 293 or 295.

For instrumental specialization: MUS 169, 175, 176, 177, 178, 179, 180 (7)[12], 290, 291, 294 (wind and percussion majors must include 2 credits of 291 and 2 credits of 294) (8), and 293 or 295 (2). Up to 4 credits of MUS 390 may be substituted for 290, 291, or 294.

The piano proficiency examination, must be completed a calendar year before student teaching. EDC 101, 312, and all courses listed above, with the exception of MUS 321 and senior-level courses in performance, instrumental classes and major ensembles, must also be completed before entering supervised student teaching. The practice teaching schedule must be preceded by a period of observation.

Philosophy

The Department of Philosophy offers a Bachelor of Arts (B.A.) degree. The Master of Arts (M.A.) program in philosophy is described in the *Graduate School Bulletin.*

Faculty: Professor Wenisch, *chairperson.* Professors Hanke, Johnson, Y.C. Kim, Peterson, Schwarz, and Zeyl; Associate Professor Kowalski; Assistant Professor Pasquerella.

Students selecting this field must complete no less than 30 credit hours in philosophy and/or from the following RLS courses: RLS 111, 125, 126, 131, 227, 327. Students must take at least one course from each of the following: logic (101, 451), ethics (312, 314, 414), and metaphysics-epistemology (341, 342) plus at least two history of philosophy courses (321 to 324).

The remaining 15 credit hours may be chosen freely from the departmental offerings. However, students planning graduate work in philosophy are advised to take PHL 341, 342, and 451.

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 Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) degrees in physics are described in the *Graduate School Bulletin.*

Faculty: Professor Malik, *chairperson.* Professors Bonner, Desjardins, Hartt, Kaufman, Kirwan, Letcher, Northby, Nunes, Penhallow, Pickart, and Steyerl; Associate Professors Kahn, Muller, and Nightingale; Emeriti Professors Cuomo, Dietz, and Stone.

BACHELOR OF ARTS

Students selecting this field must complete a minimum of 36 credits in physics, mathematics, and computer science, including: PHY 111, 112, 185, 186 or 213, 214, 285, 286 (8), PHY 322 (3), 331 (3), 381, 382 (6), 401 or 402 (1), 451 (3), 491, 492 (3), MTH 244 (3), CSC 201, 202 (6).

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.

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 an adequate 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 under Curriculum Requirements on page 29) 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 grade transcript.

The following courses will usually be required for the B.S., but exceptions and/or substitutions are possible, and may be arranged upon consultation with the department. For example, a well-prepared student may 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 (3) and general education requirements (12).

Freshman Year
Second semester: 16 credits

MTH 142 (3), PHY 213, 285 (4), CSC 201 (3), general education requirements (6).

Sophomore Year
First semester: 16 credits

MTH 243 (3), PHY 214, 286 (4), CSC 202 (3), general education requirements (6).

Sophomore Year
Second semester: 15 credits

MTH 244 (3), PHY 334 (3) and 341 (3), and general education requirements (6).

Junior Year
First semester: 18 credits

PHY 322 (3) and 381 (3), MTH 215 (3), general education requirement (6), and free electives (3).

Junior Year
Second semester: 18 credits

Mathematics elective at the 300 or 400 level (3), PHY 331 (3), 382 (3) and 420 (3), and free electives (6).

Senior Year
First semester: 15 credits

PHY 483 (3), 451 (3), MTH 461 (3), free electives (6).

[12]One course in the student's major instrument area is exempt.

Senior Year
Second semester: 16 credits

PHY 484 (3), 402 (1), 452 (3), and 455 (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 S.S. Malik (Physics). The faculty consist 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 to this, 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 either conventional physics career options or careers in physical oceanography. For physical oceanographers at the B.S. level, technical positions in private or government oceanographic research laboratories are available. 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 (Nuclear Physics). Students entering the URI Graduate School of Oceanography from this program will have a significant head start in comparison with those entering from most other undergraduate institutions.

A total of 129 credits is required for graduation.

Freshman Year
First semester: 15-17 credits

MTH 141 (3), CHM 101, 102 (4), general education electives (8-10).

Freshman Year
Second semester: 16 credits

MTH 142 (3), PHY 213, 285 (4), CSC 201 (3), general education electives (6).

Sophomore Year
First semester: 16 credits

MTH 243 (3), PHY 214, 286 (4), CSC 202 (3), general education electives (6).

Sophomore Year
Second semester: 15#18 credits

MTH 244 (3), PHY 334 (3), 341 (3), general education electives (6-9).

Junior Year
First semester: 18 credits

PHY 322 (3), 381 (3), 425 (3), MTH 461 (3), EST 409 (3), MTH 215 (3).

Junior Year
Second semester: 18 credits

MCE 354 (3), MTH 300-400-level elective (3), PHY 331 (3), 382 (3), 420 (3), free elective (3).

Senior Year
First semester: 18 credits

OCG 501 (3), PHY 483 (3), 451 (3), 520 (3) (optional), free elective (3).

Senior Year
Second semester: 13-16 credits

OCG 510 (3), PHY 484 (3), 402 (1), 452 (3) (optional), 455 (3), free elective (6).

Political Science

The Department of Political Science offers the Bachelor of Arts (B.A.) degree. The Master of Arts (M.A.) in political science and Master of Public Administration (M.P.A.) programs are described in the *Graduate School Bulletin.*

Faculty: Professor Hennessey, *chairperson.* Professors Killilea, Leduc, Milburn, Rothstein, Stein, Warren, S.B. Wood, and Zucker; Associate Professor Tyler.

Students selecting this field must complete a minimum of 30 credits in political science, including PSC 113 (3) and 116 (3). The remaining 24 credits will reflect the emphasis desired by the student, though at least one course in four of the following six fields must be selected: American politics and public administration, public law, comparative government, international relations, political theory, and political behavior.

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

Portuguese

The Department of Languages offers a number of undergraduate courses in Portuguese.

Faculty: Associate Professor McNab, *section head.*

Psychology

The Department of Psychology offers the Bachelor of Arts (B.A.) degree. The Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) degree programs in psychology are described in the *Graduate School Bulletin.*

Faculty: Professor N. Smith, *chairperson.* Professors Berman, Biller, Grebstein, Gross, A. Lott, B. Lott, Prochaska, Silverstein, Velicer, Vosburgh, and Willoughby; Associate Professors Cohen, Collyer, Florin, Kulberg, Quina, Stevenson, and Valentino; Assistant Professors Brady, Morokoff, Harlow, and Willis; Emeritus Professor Merenda.

Students in this field may follow either a general program or a preparatory program for an advanced degree.

The general program requires a minimum of 30 credits to be distributed as follows: PSY 113 (3); at least one from the group PSY 232 (3), 235 (3), 254 (3); both PSY 300 (3) and 301 (3), plus additional psychology electives to total 30 credits. Students interested in careers at the B.A. level should consult the department's *Psychology Undergraduate Manual* and their academic advisors to select additional courses.

The preparatory program adds to the requirements listed above: PSY 232 (3), 235 (3) and 254 (3); at least four courses from the group: PSY 310 (3), 335 (3), 361 (3), 381 (3), 384 (3), 385 (3), 388 (3), 391 (3) and 434 (3). Additional courses should

be selected only after consultation with an advisor.

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

Russian

The Department of Languages offers the Bachelor of Arts (B.A.) degree with a major in Russian.

Faculty: Associate Professor Aronian, *section head.* Professor Rogers; Assistant Professor Driver.

Students selecting this field complete at least 30 credits in Russian (27 credits for major in secondary education) not including RUS 101, 102.

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

Sociology

The Department of Sociology and Anthropology offers the degree of Bachelor of Arts (B.A.) in sociology and the Bachelor of Science (B.S.) degree in applied sociology. The Master of Arts (M.A.) program in sociology is described in the *Graduate School Bulletin.*

Faculty: Professor Loy, *chairperson.* Professors Carroll, England, Gelles, Gersuny, Reilly, Rosengren, and Spaulding; Associate Professors Albert, Peters, and Travisano; Assistant Professors Mederer and Shea.

BACHELOR OF ARTS

Students selecting this major must complete a minimum of 30 credits in sociology, including: SOC 201 (3), 301 (3), 302 (3), 303 (1), 304 (1), and 401 (3).

SOC 301, 302, 303, and 304 should be taken in the junior year; SOC 401 is to be taken during the senior year whenever possible. In addition to the above requirements, majors are required to complete one 400-level seminar and at least two of the remaining five courses must be at the level of 300 or above. SOC 100 and SOC 102 cannot be taken for major credit.

Students interested in anthropology are referred to the anthropology major listed previously in the 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.

Public Policy Option. A minimum of 30 credits in sociology is required including SOC 201, 301, 302, 303, 304, 401, 402, 505 (18), one 400-level seminar in sociology, and 6 credits in sociology courses at the 300 level or above.

In addition, students selecting this option must complete ECN 125 and 126 (6); MTH 109 (3); EST 408 and 412 (6), CSC 201 (3); WRT 333 (3); HSS 350 (3); PSC 113 (3); PSC 221 and 422 *or* PSC 460 and 466 (6); PSC 491 and 498 (6).

A total of 126 credits is required for graduation.

Organizational Analysis Option. A minimum of 30 credits in sociology is required including SOC 201, 241, 301, 302, 303, 304, 320, 401 (18), one 400-level seminar, and 6 credits in sociology courses at the 300 level or above.

In addition, students selecting this option must complete ECN 125 and 126 (6); MTH 109 (3); EST 408 and 412 (6); CSC 201 (3); WRT 333 (3); MGT 301, 302, 306, 380, 407, and 408 (18).

A total of 126 credits is required for graduation.

Spanish

The Department of Languages offers the Bachelor of Arts (B.A.) degree with a major in Spanish. The Master of Arts (M.A.) program in Spanish is described in the *Graduate School Bulletin.*

Faculty: Professor Hutton, *section head.* Professors Manteiga and Navascués; Associate Professors Morin and Trubiano.

Students selecting Spanish as a major will complete a minimum of 30 credits in Spanish (27 credits for major in secondary education). One 300-level course, SPA 481, 487 and one other 400-level course are required. SPA 101, 102, 121, 391, 392, and 393 cannot be counted toward the major. LIN 201 and 202 and, with permission of the advisor, the section head, the department chairperson, and the dean of the college, courses in allied fields such as history, art, and anthropology may also be selected. These requirements are the same for secondary education major.

A summer field workshop (SPA 410) in Spain or Spanish America is occasionally offered for 3 to 6 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

The Department of Speech Communication offers the Bachelor of Arts (B.A.) degree with curriculums in speech communication studies.

Faculty: Professor Anderson, *chairperson.* Professors Bailey, Devlin, and Doody; Associate Professors Brownell and Schultz; Assistant Professors Ketrow, Rowland-Morin, Mundorf, and Wood; Instructor Wynder.

Speech Communication Studies provide 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, dependent upon the student's needs and goals. Courses outside the department that relate to the student's needs and goals are also encouraged.

Courses in speech communication also can count as an option area in the B.S. degree program in 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.

Speech Communication Studies. The major requires a minimum of 30 credits in speech communication, including SPE 101, 103, and 304. The remaining 21 credits will be distributed as follows: at least two courses at the 200 level (excluding 216); three courses at the 300 level; and two courses at the 400 level (excluding SPE 471-472, 491-492). The student and an advisor will design an appropriate selection of courses.

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

Theatre

The Department of Theatre offers a Bachelor of Arts (B.A.) degree and a Bachelor of Fine Arts (B.F.A.) degree. Permission to register for work toward the B.F.A. in theatre must be obtained through a departmental interview.

Faculty: Professor Swift, *chairperson.* Professor Emery; Associate Professors Armstrong, Wheelock, and Wittwer; Instructor, McGlasson; Staff: Technical Director Galgoczy; Costume Shop Manager S. 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 emphasis on contemporary and experimental work. All members of the University community may participate in productions.

BACHELOR OF ARTS

The B.A. program in theatre is intended for students who wish to receive a general education in theatre within a liberal arts framework. A total of 33 credits is required as follows: THE 111 (3); 117 (3); 161 (3); 181 (3); 221 (3); 250 (3); 261 (3); 321 (3); 381, 382 (6); 383 or 481 (3). B.A. candidates are required to take ENG 472. 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, and stage management. All B.F.A. students are required to complete 35 hours in core courses distributed as follows: THE 111 (3); 161 (3); 181 (3); 221 (3); 250 (3); 261 (3); 291 (2); 321 (3); 350 (1); 351 or 352 (3); two courses from 381 (3), 382 (3), 383 (3), or 384 (3) to total 6 credits; 391 (2). All B.F.A. candidates are urged to take ENG 472 and to complete THE 111, 161, and 181 by the end of their freshman year.

In addition to the core requirements each student selects one of the following areas of specialization.

Acting. Students selecting acting must complete an additional 32 credits distributed as follows: THE 117 (3); 211, 212 (6); 300 (3) or 301 (3); 311, 312 (8); 400 (3) or 401 (3); 411, 412 (8); PE 105F (1), 105Y (1), or 106A (1). Recommended electives include courses in related fields such as anthropology, art, music, literature, psychology, history, speech, and sociology.

Design and Theatre Technology. Students selecting design and theatre technology must complete an additional 30 credits distributed as follows: THE 300 (3); 301 (3); 351 or 352 (3) to complete the sequence begun in the core curriculum; 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 ART 207, 251, 252, and courses in related fields.

Stage Management. Students selecting stage management must complete an additional 30 credits distributed as follows: MGT 300 (3); SPE 320 (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 the approval of the department. 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 the permission of the department.

A total of 124 credits is required for graduation.

Urban Affairs

The Urban Affairs Program Coordinating Committee offers three majors in the College of Arts and Sciences for the Bachelor of Arts (B.A.) degree: Urban Social Processes in the Urban Environment, Policy Formation in the Urban Environment, and Spatial Development in the Urban Environment. The courses that comprise these majors are offered by colleges throughout the University.

The Urban Affairs Program is described on page 11.

Students who select one of these three majors must complete six courses in the common core and four courses chosen from the specialization courses. Each of the majors requires a minimum of 30 credits.

Students who wish to major in one of these should consult the appropriate member of the Urban Affairs Program Coordinating Committee for assistance in the formulation and approval of their majors.

Urban Social Processes. This major examines the functions of urban social systems, explores urban social issues which affect the lives of individuals in an urban environment, and investigates individual and systems-change strategies. Students gain an understanding of the systemic forces which act on individuals in urban societies to produce both positive and negative outcomes. Poverty and social class, the welfare system, race, crime, rapid environmental change, all generate social issues which take on particular significance in an urban setting and have a dramatic impact on the lives of urbanites. In addition to a thorough grounding in theory, students are directed toward research and intervention techniques which they may extend, with graduate training, into the social sciences, criminology, social work, community planning, and other urban-oriented fields. Students seeking jobs at the baccalaureate level may work in social agencies (e.g., welfare, youth development, the criminal justice system), the governmental departments which sponsor and monitor these agencies or specialized educational facilities (e.g., halfway houses, preschool enrichment programs, alternative high schools).

Students are expected to satisfy the

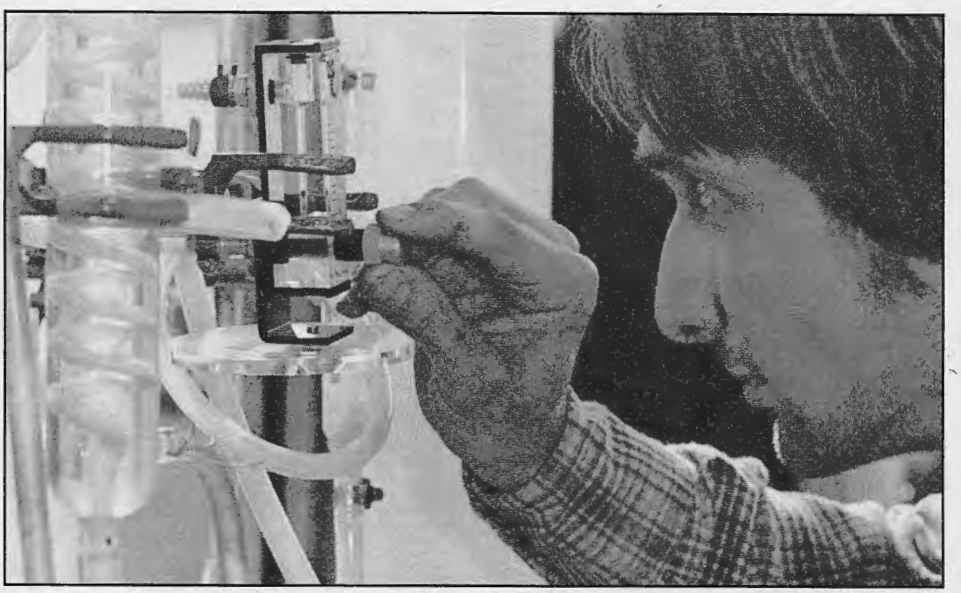
common core requirements. In addition, they are also required to select 4 courses from the following: APG 319; ECN 401, 403; HCF 220, 434; HIS 339, 343; MGT 301; PSC 420, 483, 486; PSY 335; SOC 240, 314, 316, 318, 320, 330, 336, 438; SPE 315. Students are encouraged to arrange for an urban affairs internship.

Policy Formation. This major identifies the decision-making processes within the metropolis, examines the ways in which public policies are formulated and implemented, and considers ideas about the substance as well as the outcome of the policy-formation processes. An understanding of such decision-making processes requires knowledge of the political, administrative, managerial, planning, and economic aspects of urban life. Students completing the major should be prepared for entry-level administrative jobs in government agencies, business firms and community organizations, or for activist careers in politics. They might undertake graduate work in law, public administration, community planning, business, or related disciplines.

Students are expected to satisfy the common core requirements. They are also expected to select four courses from the following: ECN 342, 401, 402, 403, 464; HIS 323, 324, 339, 340, 341, 343, 363; PSC 460, 466, 483, 495, 498; CPL 410; FIN 331, 341; MGT 321, 422, 423; REN 310; SOC 336, 240, 242, 214; MAF 421, 432, 516. Practicum or internship experience is recommended in this major. It may be obtained through URB 397.

Spatial Development. This major gives the student an interdisciplinary viewpoint of the spatial structure and environmental character of the city. The curriculum is designed to focus special attention on the arrangement, allocation, and interrelationships of human and physical resources. Man's relation to the urban ecosystem is examined in terms of the processes, patterns, networks, and activities that produce the spatial and temporal organization of urban communities. Analytical and methodological skills may be acquired from courses in cartography, remote sensing, and statistics. The structure of the major should prepare the student to deal effectively with the increasing problems of rapid urban growth and environmental deterioration.

Employment opportunities are available in such activities as urban systems analysis, economic impact studies, cartographic



drafting and air photo analysis, industrial location and regional development, and urban environmental problems. Spatial development students should be prepared for work in organizations or agencies that handle questions such as equal allocation of resources, reduction of regional disparities in goods and services, and developing effective alternatives to problems in housing, poverty, pollution, and other human concerns. These organizations can be in either the private or the public sector.

Students are expected to satisfy the common core requirements. They are also required to select four courses from the following: HIS 399; CPL 410, 434, 520; ZOO 262; FIN 341; PSC 460, 466; SOC 214; ECN 402; MAF 421, 516; INS 313; BSL 333; CVE 315; EGR 204. Students are encouraged to acquire an internship experience.

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.

The Women's Studies program requires 30 credits for a major. Four required courses are: WMS 200; a statistics (e.g., EST 220, PSY 300) or methodology course (e.g., ENG 310, SOC 301, SPE 304) approved by the Advisory Committee; WMS 300; and WMS 400. Six courses to complete the concentration may be selected from the following: ART 285; ENG 260, 385; HCF 330, 420, 430, 432, 437, 505, 559; HIS 118, 145, 347; CNS 320, 401; MGT 401; NUR 150 or 260; FSN 308; PED 475; PHL 110; PSY 470A, 470B, 470C, 480, 625A, 625C; SOC 212, 242, 316, 413, 420, 430; SPE 310 (Topic: Rhetoric of the Women's Movement); SPE 420 (Topic: Rhetoric of Early Women Suffragists); WMS 350, 450. In addition to this list, there are special courses offered by various departments each year which may also be selected with prior approval by the Advisory Committee and some additional topics courses already approved, but not offered on a regular basis.

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.

College of Business Administration

Robert P. Clagett, *Dean*
Robert A. Comerford, *Associate Dean*
Jane M. Stich, *Assistant Dean*

The 11 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 with emphasis possible on governmental, private, and public accounting; finance; general business administration; insurance; management; management information systems; management science; marketing; marketing with a textiles option; personnel management; and production and operations management.

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, computer science, marketing, organizational management, personnel, industrial relations, production and operations management, and statistics. The college emphasizes the behavioral studies and computer technology to meet the needs of the business community and society as a whole. Emphasis is placed upon 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 and has divided its courses into lower and upper divisions. The lower division courses constitute those taught in the freshman and sophomore years; the upper division—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 succcessful completion of a validating examination. All 500- and 600-level courses offered by departments in the College of Business Administration 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 dean's office,

Due to limited staff and facilities, transfers from University College to the undergraduate degree programs in business administration must be limited to 340 a year. The competitive admission policy that has been established to deal with increasing student demand consists of required courses, a minimum number of credits, and a cumulative quality point average requirement. Course requirements include mathematics, accounting, economics, statistics, and computer programming. Students apply for transfer after completion of 45 credits, therefore, the earliest a student may apply is the second semester of the sophomore year. Students with overall quality point averages of less than 2.40 are advised that there is little chance for admission to these programs. 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 are permitted to enroll only in 100- and 200-level business courses and in nonbusiness courses.

To ensure that students in business majors have access to required courses, upper level courses will be open only to juniors, seniors, and graduate students. A strict registration priority will be followed. Highest priority will be given to seniors in the College of Business Administration and in the major, followed by graduate students, juniors in the college and the major, seniors in the college but not in the major, juniors in the college but not in the major, seniors in other colleges, and juniors in other colleges. Students following an approved minor will be assigned as though they were in the college but not in the major.

Starting in the 1989-90 academic year, students in the College of Business Administration will have the opportunity to purchase a personal microcomputer and business software on a voluntary basis. Business software is used in a variety of

courses in Business Administration. University terminal and microcomputer facilities are available to students on a space-available, first-come, first-serve basis. Students are encouraged to investigate the advantages of this program. Microcomputer hardware and software obtained outside the College of Business purchase program may not be compatible with that used in the College. For additional details, contact the Office of the Dean of the College of Business Administration at (401) 792-2337.

Curriculum Requirements

The following two years are common to all majors except marketing textiles and personnel management.

The Freshman Year Program is 15 credits in each semester. The sequence MGS 101-102 is begun in the first semester and finished in the second with the balance of credits in general education.

The Sophomore Year Program is 15 credits in each semester. The ACC 201-202, ECN 125-126, and MGS 201-202 sequences are begun in the first semester and completed in the second. MGS 207 and WRT 227 are taken in alternate semesters. The balance of credits is made up of General Education and free electives.

General Education Requirements. Students are required to select and pass 39 credits of coursework from the General Education requirements as listed on page 8. Specific requirements of the College of Business Administration in each group are listed below:

Group A. A minimum of 3 credits in literature.

Groups F, L, and N. Any course for which prerequisites have been met.

Group M. MGS 101 in the freshman year.

Group S. ECN 125, 126 in the sophomore year.

Group C. SPE 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 the Economics Department.

Liberal electives are courses offered by departments outside the College of Business Administration.

Free electives may be either professional or liberal electives.

Minor — Optional. After choosing a major field, students may elect to declare a minor which will appear on their transcripts as a category separate from their major. Credit may be drawn from any combination of major, distribution, electives, and course-level categories. A minor may be defined as (1) the completion of 18 or more credits offered within a department and approved by the department chairperson or (2) the completion of 18 or more credits of related studies offered by more than one department and approved by a member of the University faculty, competent in the minor, and the Scholastic Standing Committee of the College of Business Administration. Students must declare their minor no later than the end of the add period of the semester they expect to graduate.

International Business Studies. In cooperation with the Department of Languages, the College of Business Administration offers an opportunity for students to include an international emphasis with their undergraduate business major. The business requirements include a major in finance, management, or marketing with professional electives in Multinational Finance, International Dimensions of Business and International Marketing. The student also develops a minor in a language, 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 summer, semester, or year-long professional internship positions with firms in Europe.

Accounting

The Department of Accounting offers a curriculum leading to the Bachelor of Science (B.S.) degree. 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, is described in the *Graduate School Bulletin.*

Faculty: Professor Schwarzbach, *chairperson.* Professors Martin, Matoney, and Vangermeersch.

The increased scope of governmental and business activities has greatly extended the field of accounting and has created an unprecedented demand for accountants both in government and in 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, government auditors.

The broad scope of the courses offered makes it possible for a student who is interested in any of the fields of accounting to obtain fundamental training in the field of his or her 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 and 321, FIN 301, MGT 301, and a free elective.

Junior Year
Second semester: 15 credits

ACC 312, 443, MKT 301, MGS 309, and 364.

Senior Year
First semester: 15 credits

ACC 431 and 461, BSL 333, ECN or FIN elective,[1] and a free elective.

Senior Year
Second semester: 15 credits

ACC 415, BSL 334 or 442, MGT 410, a professional elective, and a free elective.

Note: One free elective must be chosen from GMA 131, PSC 113, MGT 380, or PHL 312. Another must be chosen from PSY 113, SOC 100, 102, or 204.

[1]This may be any 300-or 400-level ECN or FIN course except FIN 341.

Finance

The Department of Finance and Insurance offers a curriculum in finance leading to the Bachelor of Science (B.S.) degree. The Master of Business Administration (M.B.A.) degree with an opportunity for specialization in finance is described in the *Graduate School Bulletin.*

Faculty: Associate Professor Dash, *chairperson.* Associate Professors Chang, Lord, and Rhee; Assistant Professors Fung and Severns; Lecturer Lie.

A major in finance prepares for managerial positions in the private, public and not-for-profit sectors of the economy. The curriculum emphasizes both financial decision-making and implementation.

Careers in finance are to be 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

BSL 333, FIN 301 and 331, MGT 301, and a liberal elective.

Junior Year
Second semester: 15 credits

FIN 322, MGS 309, MKT 301, a professional elective, and a liberal elective.

Senior Year
First semester: 15 credits

Finance elective[2], three professional electives, and a free elective.

Senior Year
Second semester: 15 credits

Two finance electives[2], MGT 410, a professional elective, and a free elective.

General Business Administration

The College of Business Administration offers a curriculum in general business administration leading to the Bachelor of Science (B.S.) degree. The general business administration 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 the general administration curriculum shall be limited to a maximum of 9 credit hours of professional electives in a specific major. A general business administration student should take a broad spectrum of courses and not concentrate in one special field of study.

Junior Year
First semester: 15 credits

FIN 301, MGS 309, MKT 301, MGT 301, and a free elective.

Junior Year
Second semester: 15 credits

FIN elective, an MKT elective, and MGT elective at the 300 level, INS 301, and a free elective.

Senior Year
First semester: 15 credits

BSL 333, two professional electives, and two free electives.

Senior Year
Second semester: 15 credits

MGT 410, three professional electives, and a free elective.

Insurance

The Department of Finance and Insurance offers a curriculum in insurance leading to the Bachelor of Science (B.S.) degree. The Master of Business Administration (M.B.A.) degree with an opportunity for specialization in insurance is decribed in the *Graduate School Bulletin.*

Insurance is a basic industry which functions throughout the economy to indemnify loss and reduce risk. In performing these functions, insurance companies, through their home and branch offices, their agencies and bureaus, currently employ about a million persons in a great variety of jobs (selling, administrative, technical, research, etc.).

The curriculum offers comprehensive preparation for diversified career opportunities in insurance, including satisfaction of Rhode Island's prelicensing education requirements for agents' and brokers' licenses in life and accident-sickness fields.

Junior Year
First semester: 15 credits

BSL 333, FIN 301, INS 301, MGT 301, and a professional elective.

Junior Year
Second semester: 15 credits

INS 313, 325, FIN 331, MKT 301, and a professional elective.

Senior Year
First semester: 15 credits

MGS 309, two INS electives, a liberal elective, and a free elective.

Senior Year
Second semester: 15 credits

INS elective, MGT 410, a professional elective, a liberal elective, and a free elective.

Note: The three INS electives must be chosen from INS 414, 433, 471, or either FIN 341 or 442.

Management

The Department of Management offers a curriculum leading toward the Bachelor of Science (B.S.) degree. The Master of Business Administration (M.B.A.) degree with an opportunity for specialization in management is described in the *Graduate School Bulletin.*

Faculty: Professor Sink, *chairperson.* Professors Coates, Comerford, deLodzia, Overton, and Schmidt; Associate Professors Laviano and Scholl; Assistant Professors Beauvais, Cooper, Dunn, Hetzner, Hickox, and King.

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 upon decision-making from the perspective of the policy sciences. Courses tend to cluster in the areas of behavioral science, including

[2]Finance electives must be drawn from FIN 401, 420, 425, 431, 433, 442, 452, and 460.

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.

Junior Year
First semester: 15 credits

FIN 301, MKT 301, MGT 301, one professional elective, and one free elective.

Junior Year
Second semester: 15 credits

MGS 309, MGT 302, 303, one free elective, and one liberal elective.

Senior Year
First semester: 15 credits

BSL 333, MGT 306, 380, and 407, and a free elective.

Senior Year
Second semester: 15 credits

MGT 410 and 423, one professional elective, and two free electives.

Management Information Systems

The Department of Management Science and Information Systems offers a curriculum in management information systems leading toward the Bachelor of Science (B.S.) degree. The field of information systems is concerned with the collection, storing, processing, structuring, retrieval, and reporting of information to assist managers in the operations, management, and decision-making functions of an organization.

The program provides a thorough grounding in computer technology, systems analysis, combined with business and management training.

Junior Year
First semester: 15 credits

BSL 333, FIN 301, MGS 309, 307, 483.

Junior Year
Second semester: 15 credits

MKT 301, MGT 301, MGS 364, 484, professional elective.

Senior Year
First semester: 14 credits

MGS 485, MGS elective, two professional electives, and liberal elective.

Senior Year
Second semester: 15 credits

MGS 488, MGT 410, MGS elective, professional elective, and a free elective.

Management Science

The Department of Management Science offers a curriculum in management science leading to the Bachelor of Science (B.S.) degree. The Master of Business Administration (M.B.A.) degree with an opportunity for specialization in management science is described in the *Graduate School Bulletin*.

Faculty: Professor Jarrett, *chairperson*. Professors Armstrong, Budnick, Kim, Koza, McLeavey, Mojena, Narasimhan, and Shen; Associate Professors Ageloff, Humphrey, and Mangiameli; Assistant Professors Chen, Ebrahimpour, and Westin.

Management science (MGS) is concerned with the development and application of quantitative techniques to the solution of problems faced by managers of public and private organizations. More specifically, theory and methodology (tools) in mathematics, probability, statistics, and computing are adapted and applied in the identification, formulation, solution, implementation, control, and evaluation of administrative or decision-making problems.

The MGS major relates to the interface between quantitative techniques and their application in the real world. Upon graduating, majors will be qualified for (1) staff positions responsible for implementing and communicating quantitative approaches to decision-making, (2) management trainee programs which lead to assignments in any of the functional areas of an organization, or (3) graduate study leading to a master's degree or a doctorate.

Junior Year
First semester: 15 credits

FIN 301, MGS 364, 370, a professional elective, and a free elective.

Junior Year
Second semester: 15 credits

BSL 333, MGS 309, MGT 301, an MGS elective[3], and a free elective.

Senior Year
First semester: 15 credits

MGS 465 or 466, MKT 301, an MGS elective[3], a professional elective, and a free elective.

Senior Year
Second semester: 15 credits

MGT 410, an MGS elective[3], two professional electives, and a free elective.

Marketing

The Department of Marketing offers a curriculum leading to the Bachelor of Science (B.S.) degree. 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 marketing-textiles option, leading to the Bachelor of Science degree, may also be pursued in the Department of Marketing. This program is offered in conjunction with the Department of Textiles, Fashion Merchandising and Design. The option is designed to prepare students for managerial positions in the textile industry. The Master of Business Administration (M.B.A.) degree with an opportunity for specialization in marketing is described in the *Graduate School Bulletin*.

Faculty: Professor Venkatesan, *chairperson*. Professors Alton, Della Bitta, N. Dholakia, R. Dholakia, Johnson, and Weeks; Associate Professor Lysonski; Assistant Professors Jain and Lessne.

A major focus of marketing is the determination of product and service needs of consumers and industries. Marketing research, information systems, and analysis are used in the development and manage-

[3]MGS electives must be drawn from MGS 445, 450, 460, 470, 475, 495, and either 465 or 466.

ment of products and services as well as the design and execution of communications, pricing, and distribution channels.

Junior Year
First semester: 15 credits

MGS 309, MGT 301, MKT 301, one free elective, and one liberal elective[4].

Junior Year
Second semester: 15 credits

FIN 301, MKT 415, one MKT elective, a professional elective, and a free elective.

Senior Year
First semester: 15 credits

BSL 333, two MKT electives, a professional elective, and a liberal elective[4].

Senior Year
Second semester: 15 credits

MGT 410, MKT 409, one MKT elective, a professional elective, and a liberal elective[4].

Marketing-Textiles Option

Freshman Year
First semester: 16 credits

MGS 101, TMD 103, CHM 103 and 105, an art elective from Group A, and an elective from Group F.

Freshman Year
Second semester: 15 credits

MGS 102, a speech elective from Group C, one elective each from Groups L, A, and F.

Sophomore Year
First semester: 15 credits

ACC 201, ECN 125, MGS 201 and 207, and WRT 227.

Sophomore Year
Second semester: 16 credits

ACC 202, ECN 126, MGS 202, CHM 124, and TMD 224.

Junior Year
First semester: 16 credits

FIN 301, MGT 301, MKT 301, TMD 303, and 240 or 340 or 440.

Junior Year
Second semester: 15 credits

MGS 309, MKT 415, TMD 403, a MKT elective, and a free elective.

Senior Year
First semester: 15 credits

BSL 333, two MKT electives, a TMD elective, and a free elective.

Senior Year
Second semester: 15 credits

MGT 410, MKT 409, one MKT elective, TMD 433, and a liberal elective[4].

Personnel Management

The Department of Management offers a curriculum in personnel management leading to the Bachelor of Science (B.S.) degree. The field of personnel management is concerned with the management and effective utilization of human resources in traditional functions such as recruitment, selection, development, motivation, and compensation, and the industrial relations areas of collective bargaining, labor dispute settlement, labor history, and labor organizations. Additionally, the legal, social, and organizational frameworks and requirements are focused upon with required courses in labor relations law, social security, and protective labor legislation (OSHA, unemployment and workers' compensation, EEO, etc.), organizational behavior, labor economics, and recommended courses in business and labor history.

The personnel management curriculum provides a broad, but rigorous and structured preparation for professional opportunities in Personnel Management within large and small industrial or service organizations in the public sector (federal, state, local), not-for-profit organizations, and for professional staff positions within trade unions and other employee organizations. Additionally, qualified students will be encouraged to continue their studies within specialized master's and Ph.D. programs.

Freshman Year
First semester: 15 credits

MGS 101, PSY 113 is recommended as a liberal elective, one elective each from Groups A, F, and N.

Freshman Year
Second semester: 15 credits

MGS 102, HIS 143 is recommended as a Group L elective, and one elective each from Groups A, F, and N.

Sophomore Year
First semester: 15 credits

ACC 201, ECN 125, MGS 201, 207, and a group C elective.

Sophomore Year
Second semester: 15 credits

ACC 202, ECN 126, MGS 202, WRT 227, and HIS 349 is recommended as a Group L elective.

Junior Year
First semester: 15 credits

FIN 301, MGT 301, 303, 321, and MKT 301.

Junior Year
Second semester: 15 credits

MGS 309, MGT 302, 422, 435, and BSL 333.

Senior Year
First semester: 15 credits

MGT 426, 437, INS 433, a liberal elective, and a free elective.

Senior Year
Second semester: 15 credits

MGT 410, 423, a liberal elective, and two free electives.

Production and Operations Management

The Department of Management Science offers a curriculum in production and operations management leading to the Bachelor of Science (B.S.) degree. The Master of Business Administration (M.B.A.) degree with an opportunity for specialization in production and operations management is described in the *Graduate School Bulletin*.

Issues, concepts, and techniques encountered in efficiently managing the modern production function in industry and business are the main concerns of this curriculum. The modern production function is here defined in a wider sense, to include all kinds of operations which employ men and machines to produce visible goods as well as to render intangible services. A basic understanding of the management task of design and evaluation of the possible alternative

[4]One liberal elective is to be selected from the following: APG 203, PHL 312, PSY 113, SOC 100, 102, 204, SPE 103, 200, 210, 220, WRT 300, and 333.

operations and processes is emphasized. Practice and implications of computer-based systems and operations in management are also investigated.

The operations management major prepares students to become certified production and inventory controllers. Certification examinations are administered by the national Educational Testing Service (ETS) and prepared by practitioners in the American Production and Inventory Control Society. Coursework in the major goes well beyond that necessary for the examinations and should put the students at the forefront of the field.

Among the topics covered in the major are: forecasting, capacity planning, inventory planning, material requirements planning, and operations scheduling and control.

Junior Year
First semester: 15 credits

FIN 301, MGS 309, MGS 364 or 301 (students electing MGS 301 must complete the sequence MGS 365-366), a professional elective, and a free elective.

Junior Year
Second semester: 15 credits

BSL 333, MGT 301, MKT 301, a professional elective, and a free elective.

Senior Year
First semester: 15 credits

MGS 307 or 483; MGS 310 and 311; a choice of one: 445, 450, or 460; and a professional elective.

Senior Year
Second semester: 15 credits

MGS 458, MGT 302 or 423, MGT 410, a professional elective, and a free elective.

College of Continuing Education

Walter A. Crocker, Jr., *Dean*
Gerald R. DeSchepper, *Associate Dean*

The College of Continuing Education offers courses and degree programs designed for adults whose family or work responsibilities have caused interruption in their formal post-high-school education. Academic programs lead to Bachelor of Science degrees in business administration; nutrition and dietetics; food science technology; home economics; human development and family studies; 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 business institutions and human studies. Graduate-level programs include Master of Business Administration (including an option for experienced executives), Master of Library and Information Studies, Master of Marine Affairs, Master of Public Administration, Master of Science in clinical laboratory sciences, 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 (CEU)[1] courses are also offered. In addition, institutes and special courses are planned for business, industry, labor, government, and the professions.

Courses are offered on weekday mornings, afternoons, and evenings, and on Saturdays in the fall, spring, and summer. 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 Session. The 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 terms at Kingston and Providence. In addition, a number of special programs, including study abroad, are offered at varying dates in the alternate term. Students may attend either or both campuses and enroll in day or evening courses offered in any summer term. 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 7 credits per summer term including simultaneous courses in the alternate term. Exceptions are allowed with permission of the student's academic dean.

Bachelor of General Studies

The 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

[1]Continuing Education Unit.

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 Services Office of the College of Continuing Education.

The B.G.S. program consists of six required sections listed below.

The Pro-Seminar. (4 credits) This required reentry course (BGS 100) introduces adult students to the processes of academic thought and inquiry, builds confidence in their capacity to do college-level work, and helps them identify their scholastic strengths and interests. During the Pro-Seminar students are required to take the College Level Examinations Program (CLEP) General Examinations (for which there is a fee). CLEP credits may be applied toward the General Education requirements.

General Education Requirements. (39 credits) Students in the B.G.S. program must meet the University's General Education requirements as explained on page 9 of this bulletin. B.G.S. students may use BGS 390, 391, and 392 to fulfill General Education requirements or may take other approved General Education courses appropriate to their program. Students should consult frequently with B.G.S. advisors.

Majors. (45 credits) B.G.S. students have a choice of two multidisciplinary majors: business institutions and human studies. Each consists of 15 three-credit courses.

Both the human studies major and business institutions major allow students to take courses in several disciplines to meet their educational goals in a nontraditional way. Although the business institutions major is carefully prescribed, the student will note that the human studies program encourages the student to work creatively with an advisor to design an individualized major that meets both student needs and the general goals of the program.

Business Institutions Major

ACC 201	Elementary Accounting I
ACC 202	Elementary Accounting II
BSL 333	Law in a Business Environment
ECN 125	Economic Principles I
ECN 126	Economic Principles II
CSC 201	Introduction to Computing I
FIN 301	Financial Management
MGS 101	Introduction to Quantitative Analysis I or MTH 109 Algebra and Trigonometry
MGS 102	Introduction to Quantitative Analysis II or MTH 141 Introductory Calculus
MGS 201	Managerial Statistics or EST 220 Statistics in Modern Society
MGS 309	Production Management
MGT 301	Fundamentals of Management
MKT 301	Marketing Principles
WRT 227	Business Communications

In addition to the above required courses, students must elect one liberal elective course offered by a department outside their majors. 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.

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, Geography, History, Political Science, Psychology, and Sociology and Anthropology. 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: EST 220, HIS 395, PSY 300, or SOC 301.

Major Seminar (3 credits, BGS 397). Students will take this course near the end of their degree. It will give students an opportunity to review and evaluate the skills and knowledge they have acquired through their major. It is offered only in the fall semester and in alternate years.

Area of Emphasis (15 credits). The area of emphasis provides the student an opportunity to select a group of courses which focuses 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[2]
Community Planning
Computer Science
Consumer Affairs[2]
Economics
Education[2]
Food Science and Nutrition[2]
Geography
Health[2]
History
Human Development and Family Studies
Human Science and Services
Journalism
Languages (Portuguese, Spanish, French)
Management[2]
Marine Affairs
Marketing[2]
Nursing[2]
Political Science
Psychology
Sociology, Anthropology, and Social Welfare
Speech Communication
Urban Affairs
Women's Studies

[2]In these departments only certain courses are appropriate for the human studies major. See an advisor for details.

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 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.

B.G.S. Senior Seminars. Upon completion of at least 40 credits, a student may begin to take the sequence of three required 6-credit senior seminars (BGS 390, 391, 392). The senior seminars may be applied either to the General Education requirement or to the elective requirement of the B.G.S. program.

Senior Project. (3 credits) All B.G.S. students must complete the BGS 399 Senior Project or a departmental 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

Charges and fees set forth in this listing are subject to change without notice. All charges are payable by the semester and are due at the time of registration. Checks or money orders should be made payable to The University of Rhode Island. For financial assistance, refer to "Financial Aid" in this section.

Tuition and Fees. The registration fee is $10, payable once each semester. Rhode Island resident undergraduates pay $74 per credit. Out-of-state undergraduates pay $238 per credit. Rhode Island resident graduate students pay $104 per credit. Out-of-state graduate students pay $232 per credit.

Refund Policy. If a course is officially dropped before the first class meeting, a full refund of tuition will be authorized. After classes have begun, the following refund schedule applies:

Fall/Spring Semester	*Refund*
Before first class	100%
Until the close of the Add period	80%
After the Add period	No refund

Summer Session	*Refund*
Before first class	100%
Until the close of the Add period	70%
After the Add period	No refund

The registration fee is refundable only when a course is cancelled or closed by the University. There is no charge for adding a course to replace one dropped or cancelled.

Financial Aid. Only matriculated students enrolled on at least a half-time basis (6 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 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, campus ministry 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 the opportunity to meet with other adult students who have been trained to help them with problem solving, including issues of minority groups and of the handicapped. 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, library, nursery school, 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 of Continuing Education is accomplished by completing a registration form 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 upon a student's acceptance as a degree candidate.

Beginning students who have been away from school for some time and have little or no coursework beyond high school are encouraged to register in one of the special entry courses. These are BGS 100, the Pro-Seminar, and WRT 123, College Writing for Returning Students.

Any adult may enroll as a nonmatriculated student in the 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 telephoned request.

Application Procedures. A student wishing to enroll in an undergraduate degree program in the College of Continuing Education does so through the Academic Services Office. An initial interview is recommended so that program options may be explored as well as the student's capabilities. A student then files an Application for an Undergraduate Degree and provides the Academic Services 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 Intention to Graduate form with the Academic Programs Office three semesters in advance of the contemplated date.

College of Engineering

Hermann Viets, *Dean*
Robert H. Goff, *Associate Dean*

The College of Engineering offers undergraduate majors in chemical, chemical and ocean, civil, computer, electrical, industrial, materials, and mechanical engineering. In addition, ocean options are available in civil and 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 engineering follow the curriculums for chemical, civil, 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 and the basic sciences, and of 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 socio-technological 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 courses in general chemistry, General Education electives, MTH 141, 142; MCE 162 and/or PHY 213 and 285.

Students who are undecided about engineering, but who wish to keep it open as an option, should take note that MTH 141 and 142, MCE 162 and/or PHY 213 and 285, 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 grade 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 grade 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 grade point average of 2.00 or better in all required science, mathematics, and engineering courses (including professional electives).

General Education Requirements. Engineering students, in common with all students in the University, must meet the University's General Education requirements listed on page 9 of this catalog. In these courses students are exposed to and challenged by concepts from the humanities and social sciences to insure 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 which satisfy both the University requirements and the requirements of the Accreditation Board for Engineering and Technology. 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 and Culture group, and six credits each in English Communications, Fine Arts and Literature, Social Sciences, and Letters. In two of the latter three groups, both courses must be taken in the same department. The second course may not be at the 100 level, unless it has the first course as a prerequisite or is an obvious continuation of the first.

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 Chemical and the Chemical and Ocean Engineering majors, all engineering students take the following 16 credits in the first semester.[1]

3 CHM 101 Gen. Chemistry I
1 CHM 102 Lab. for CHM 101
3 MTH 141 Introd. to Calc. with Anal. Geometry
3 ECN 125 Economic Principles
3 CSC 201 Introd. to Computing
3 General education elective

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.

Accreditation. The curriculums in chemical, civil, electrical, industrial and mechanical engineering are currently accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET).

Biomedical Electronics Engineering

Because of severe staffing problems, the undergraduate program in biomedical electronics engineering was suspended, effective June 1984. No new students are being accepted into the program. When sufficient facilities and staff are available to meet student demands, the program will be recalled to active status.

The Bachelor of Science (B.S.) degree in biomedical electronics engineering is offered by the Department of Electrical 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. See the *Graduate School Bulletin*.

Biomedical engineers design medical instruments such as electrocardiographs, electroencephalographs, blood analyzers and X-ray machines for diagnosis of disease, equipment such as radiotherapy machines, pacemakers and lasers for surgery, and develop artificial organs for prosthesis. They design computer systems to help physicians monitor critically ill patients, to correlate a multitude of disease symptoms in order to diagnose a disease, and to determine the best course of treatment.

Biomedical engineers are employed in (1) the medical instrument industry, where they design, manufacture, sell and service medical equipment; (2) hospitals, which employ engineers in increasing numbers to select, evaluate and maintain complex medical equipment and to train the hospital staff in their use, and (3) medical and biological research centers, which use the specialized training of the biomedical engineer to apply engineering techniques in research projects.

The biomedical electronics engineering program combines study in the biological sciences with those areas of engineering which are particularly important for the application of modern technology to medicine. 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 electronics engineering program.

For transfer from the University College to the College of Engineering in the Biomedical Electronics Engineering program students must have completed *all science, mathematics, and engineering courses required during the first two semesters* (see the following) with grade point average of 2.00 or better.

The major requires 137 credits.

Freshman Year
First semester: 16 credits

3 CHM 101 Gen. Chemistry I
1 CHM 102 Lab. for CHM 101
3 MTH 141 Introd. to Calculus with Anal. Geometry
3 ECN 125 Economic Principles
3 CSC 201 Introd. to Computing
3 Gen. educ. elective

Freshman Year
Second semester: 18 credits

4 CHM 124 Organic Chemistry
3 MTH 142 Intermed. Calc. with Anal. Geometry
3 PHY 213 Elem. Physics
1 PHY 285 Lab. for PHY 213
4 ZOO 111 Gen. Zoology
3 Gen. educ. elective

Sophomore Year
First semester: 16 credits

3 ELE 211 Linear Systems and Circuit Theory I
3 ELE 210 Introd. to Elec. & Magnetism
1 ELE 214 Circuits Lab. I
3 MTH 243 Calc. & Anal. Geometry
3 ZOO 345 Basic Animal Physiology
3 Gen. educ. elective

Sophomore Year
Second semester: 19 credits

3 ELE 205 Microprocessor Lab.
3 ELE 212 Linear Systems and Circuit Theory II
1 ELE 215 Circuits Lab. II
3 MCE 263 Dynamics
3 MTH 362 Adv. Engr. Math I
3 PHY 223 Introd. to Acoustics & Optics
3 Gen. educ. elective

Junior Year
First semester: 18 credits

3 ELE 313 Linear Systems
3 ELE 322 Electromagnetic Fields I
3 MTH 363 Adv. Engr. Math II
3 PHY 341 Introd. to Modern Physics
6 Gen. educ. electives

Junior Year
Second semester: 16 credits

3 ELE 314 Linear Systems and Signals
3 ELE 323 Electromagnetic Fields II
4 ELE 342 Electronics I
3 PHY 420 Introd. to Thermodynamics & Stat. Mechanics (preferred) **or** MCE 341 Fundamentals of Thermodynamics
3 Gen. educ. elective

Senior Year
First semester: 18 credits

5 ELE 443 Electronics II
3 ELE 586 Biomedical Electronics I **or** ELE 588 Biomedical Engr. I
1 ELE 481 Biomedical Engr. Seminar
3 Gen. educ. elective
3 Math elective
3 Professional elective

Senior Year
Second semester: 16 credits

3 ELE 587 Biomedical Electronics II **or** ELE 589 Biomedical Engr. II
1 ELE 482 Biomedical Engr. Seminar
3 ZOO 442 Mammalian Physiology

[1]In addition, students in the Civil and Industrial Engineering programs also take EGR 102 (1 credit) in the first semester.

6 Professional electives[2]
3 Free elective

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[3]. A curriculum leading to the Bachelor of Science degree in chemical and ocean engineering (unaccredited) is offered in cooperation with the Department of Ocean Engineering (see page 63). The Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) degrees, also offered by the department, are described in the *Graduate School Bulletin*.

Faculty: Professor Barnett, *chairperson.* Professors Estrin, Knickle, Rockett, Rose, and Shilling; Associate Professors Bose, Brown, Gray, and Gregory; Adjunct Associate Professor DiMeglio.

The chemical engineer is concerned with the application and control of processes leading to changes in composition. The 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 chemical plants in the area. 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 his 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.

The senior year curriculum for students majoring in chemical and ocean engineering is listed under Ocean Engineering, page 63.

Programs can be designed for those interested in special areas such as material sciences, biochemical engineering, and pollution control, and in general chemical engineering. Programs for those interested in entering dental and medical schools have been successful.

The major requires 131 credits.

Freshman Year
First semester: 15 credits

5 CHM 191 Gen. Chemistry[4]
1 CHE 101 Foundations of Chemical Engr.
3 MTH 141 Introd. Calc. with Anal. Geometry
6 Gen. educ. electives[5]

Freshman Year
Second semester: 15 credits

5 CHM 192 Gen. Chemistry[4]
3 MTH 142 Intermed. Calc. with Anal. Geometry
4 PHY 213 Elem. Physics and PHY 285 Physics Lab.
3 ECN 125 Economic Principles

Sophomore Year
First semester: 17 credits

3 CHE 212 Chemical Process Calculations
4 CHM 291 Organic Chemistry
3 MTH 243 Calc. for Functions of Several Variables
4 PHY 214 Elem. Physics and PHY 286 Physics Lab.
3 Gen. educ. elective[5]

Sophomore Year
Second semester: 16 credits

3 CHE 272 Introd. to Chemical Engr.
3 CHE 332 Physical Metallurgy **or** approved professional elective[5]
4 CHM 292 Organic Chemistry
3 ELE 220 Passive and Active Circuits
3 MTH 244 Differential Equations

Junior Year
First semester: 17 credits

3 CHE 313 Chem. Engr. Thermodynamics
3 CHE 347 Transfer Operations I
2 CHM 335 Phys. Chemistry Lab.
3 CHM 431 Physical Chemistry
3 Approved mathematics elective[5]
3 Gen. educ. elective[5]

Junior Year
Second semester: 17 credits

3 CHE 314 Chem. Engr. Thermodynamics
2 CHE 322 Chem. Engr. Micro. Lab.
3 CHE 348 Transfer Operations II
3 CHE 425 Process Dynamics and Control
3 CHM 432 Physical Chemistry
3 Gen. educ. elective[5]

Senior Year
First semester: 17 credits

1 CHE 328 Industrial Plants
2 CHE 345 Chem. Engr. Lab.
2 CHE 349 Transfer Operations III
3 CHE 351 Plant Design and Economics
3 CHE 464 Industrial Reaction Kinetics
3 PHY 341 Introd. to Modern Physics **or** approved professional elective[5]
3 Gen. educ. elective[5]

Senior Year
Second semester: 17 credits

2 CHE 346 Chem. Engr. Lab.
3 CHE 352 Plant Design and Economics
3 Approved professional elective[5]
3 CVE 220 Mechanics of Materials **or** approved professional elective[5]
6 Gen. educ. electives[5]

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[2]Select from approved list (see advisor). Professional electives approved for this program in the first semester include BCP 311, 403, 435; CHM 335, 431; CSC 311; ELE 331, 457, 581; MCE 354; MTH 244, 471; ZOO 441; in the second semester BCP 302; CHM 336, 432; CSC 311, 400; ELE 436, 444, 458, 484, 581; MCE 354; MTH 244, 472.

[3]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.

[4]For CHM 191 and 192 (10 credits), students may substitute CHM 101, 102, 112, 114, and 212 (12 credits).

[5]In order to meet accreditation requirements, these courses, together with at least 18 credits of the general education electives, must be chosen from a group approved by the department, with the approval of the advisor designated by the department.

Civil and Environmental Engineering

The Department of Civil and Environmental Engineering offers a curriculum leading to the Bachelor of Science (B.S.) degree in civil engineering and, in cooperation with the Department of Ocean Engineering, a curriculum leading to the Bachelor of Science (B.S.) degree in Civil Engineering with an ocean option. The Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) degrees, also offered by the department, are described in the *Graduate School Bulletin*.

The Bachelor of Science program in Civil Engineering is accredited by the Accreditation Board for Engineering and Technology.

Faculty: Professor Kovacs, *chairperson*. Professors McEwen, Poon, and Silva; Associate Professors Lee, Marcus, Urish, and R. Wright; Assistant Professors Chang, Karamanlidis, and Thiem; Emeritus Professor Nacci; Adjunct Professor T. Wright; Adjunct Associate Professors Huston and Shaw; Adjunct Assistant Professor Badorek.

Civil engineers are responsible for researching, developing, planning, designing, constructing, and managing many of the complex systems and facilities which are essential to our modern civilization. These include: water supply and pollution control systems; all types of transportation systems from pipelines to city streets; 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 which are 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 environmental 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. Professional electives and general education electives must be selected in consultation with the adviser to satisfy the Accreditation Board for Engineering and Technology accreditation requirements.

Total credits required: 136.

Freshman Year
First semester: 17 or 18 credits

3 CHM 101 Gen. Chemistry
1 CHM 102 Chemistry Lab.
1 EGR 102 Basic Graphics
3 MTH 141 Introd. Calc. with Anal. Geometry
3 CSC 201 Introd. to Computing I
3 ECN 125 Economic Principles
3 Gen. educ. elective **or**
4 GEL 103 Physical Geology **and** GEL 106 Geol. Lab.

Freshman Year
Second semester: 16 or 17 credits

3 MTH 142 Intermed. Calc. with Anal. Geometry
3 MCE 162 Statics
3 PHY 213 Elem. Physics
1 PHY 285 Physics Lab.
3 Gen. educ. elective **or**
4 GEL 105 Geol. Earth Sciences **and** GEL 106 Geol. Lab.
3 Gen. educ. elective

Sophomore Year
First semester: 16 credits

3 MTH 243 Calc. and Anal. Geometry
3 MCE 263 Dynamics
3 PHY 214 Elem. Physics
1 PHY 286 Physics Lab.
3 CVE 216 Metronics
3 Gen. educ. elective

Sophomore Year
Second semester: 15 credits

3 MTH 244 Differential Equations
3 CVE 220 Mechanics of Materials
3 ELE 220 Passive and Active Circuits
6 Gen. educ. electives

Junior Year
First semester: 16 or 17 credits

2 CVE 322 Civil Engr. Lab.[6] **or**
3 Gen. educ. elective
3 MCE 354 Fluid Mechanics
3 CVE 352 Structural Anal. and Design I
4 CVE 374 Environmental Engr.
4 CVE 381 Geotechnical Engr.

Junior Year
Second semester: 17 or 18 credits

2 CVE 322 Civil Engr. Lab.[6] **or**
3 Gen. educ. elective
4 CVE 347 Highway Engineering
3 CVE 353 Structural Anal. and Design II
4 CVE 370 Hydraulic Engr.
3 Gen. educ. elective
1 CVE 304 Introd. to Professional Practice

Senior Year
First semester: 19 credits

3 Approved math elective[7]
3 Free elective
3 CVE 495 Civil Engr. Systems **or** prof. elective
3 CVE 465 Anal. and Design of Concrete Structures
6 Professional electives
1 CVE 305 Introd. to Professional Practice

Senior Year
Second semester: 18 credits

6 Professional electives
3 CVE 495 Civil Eng. Systems **or** professional elective
3 Gen. educ. elective
3 Approved statistics elective
3 Approved science elective[8]

Professional electives. Twelve of the fifteen required professional electives credits must be in the Civil and Environmental Engineering Department and must include at least 6 design credits. A list of courses and their design credits is available in the Civil and Environmental Engineering Department.

Computer Engineering

The Bachelor of Science (B.S.) degree in computer engineering is offered by the Department of Electrical Engineering. Specialization in computer engineering is also available within the Master of Science (M.S.) and Doctor of Philosophy

[6]Students can take the lab in either the fall or spring semester.

[7]200 level or above course in mathematics. Course must be approved by advisor.

[8]Any course for which the prerequisite is met by CHM 101, GEL 103, or PHY 214 or any course in biochemistry and biophysics, biology, botany, microbiology, or zoology. Course must be approved by advisor.

(Ph.D.) programs in electrical engineering, described in the *Graduate School Bulletin*.

Faculty: Electrical Engineering faculty; *coordinators:* Professors Jackson and Tufts.

Due to limited facilities and staff, transfers from University College to the undergraduate programs in Computer Engineering and Electrical Engineering will be limited to a total of 90.

Applications for transfer to the College of Engineering will be considered in June for students who wish to be admitted for the following fall semester. Students must complete transfer applications in University College and submit them to the Associate Dean of Engineering by May 1. Admissions will be considered by the Associate Dean, in consultation with the Undergraduate Affairs Committee in Electrical Engineering. Admission decisions will be based on cumulative quality point averages in MTH 141, 142; PHY 213, 285; CHM 101, and CSC 201. Students with quality point averages of less than 2.50 in these courses are advised that there is little chance for admission to Electrical Engineering or Computer Engineering.

The Department of Electrical Engineering will no longer admit students into its sophomore courses who have not been formally admitted into Electrical Engineering or Computer Engineering.

Computers and computer-like devices have transformed society, particularly in the technologically advanced countries. Computers are usually associated with data processing and high technology control and signal processing functions such as numerical controlled machine tooling, computer-aided machine design, tomography and medical imaging, speech analysis and synthesis, and picture and data communication. Both mini- and microcomputers now play an important role in our everyday work and play environment. Word processing, paperless offices, and microprocessor-controlled games are prominent examples.

Computer engineering is concerned with the design and efficient use of large or small computers and the development of other machines and instruments which contain computers, or parts of computers, as essential building blocks, from the hand-held calculator to the large multiterminal computer, and the programmable assembly machine. A programmable machine is one which will change its operation in response to a program or command.

Computer engineers may be employed in the design, service, operation, and sale of computer systems as well as the design, service and sale of complex machinery, instruments, and systems — such as an automated subway — which require computers as essential parts. The employers may be industrial organizations, transportation companies, federal laboratories, or local government.

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, magnetism, and heat transfer. Engineers use all of this knowledge to create new devices and systems which satisfy perceived human needs.

For transfer from the 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* (see below) with a grade average of 2.00 or better.

The major requires 130 credits.

Freshman Year
First semester: 16 credits

3 CSC 201 Introd. to Computing I
3 CHM 101 Gen. Chem. Lecture I
1 CHM 102 Lab. for Chemistry I
3 MTH 141 Introd. Calc. with Anal. Geometry
3 ECN 125 Economic Principles
3 Gen. educ. elective

Freshman Year
Second semester: 16 credits

3 PHY 213 Elem. Physics I
1 PHY 285 Lab. for Physics I
3 MTH 142 Intermed. Calc. with Anal. Geometry
3 CSC 202 Introd. to Computing II
3 Gen. educ. elective
3 Natural science elective

Sophomore Year
First semester: 17 credits

3 ELE 211 Linear Systems and Circuit Theory II
3 PHY 214 Elem. Physics II
1 PHY 286 Physics Lab.
1 ELE 214 Circuits Lab. I
3 MTH 243 Calculus and Anal. Geometry
6 Electives

Sophomore Year
Second semester: 16 credits

3 ELE 205 Microprocessor Lab.
3 ELE 212 Linear Systems and Circuit Theory II
1 ELE 215 Circuits Lab. II
3 MTH 362 Adv. Engr. Math. I
3 PHY 341 Modern Physics I
3 CSC 311 Machine & Assem. Lang. Programming

Junior Year
First semester: 18 credits

3 Professional elective
3 Professional elective
3 CSC 301 Comparative Programming Lang.
3 MTH/CSC 447 Discrete Math. Structures
3 MTH 363 Adv. Engr. Math. II
3 Gen. educ. elective

Junior Year
Second semester: 16 credits

4 ELE 342 Electronics I
3 ELE 405 Digital Computer Design
3 CSC 411 Comp. Organization and Prog. **or**
CSC 416 Microcomp. Systems Architecture
3 Professional elective
3 Gen. educ. elective

Senior Year
First semester: 15 credits

3 CSC 412 Operating Systems
3 ELE 408 Comp. Organization Lab.
3 Professional elective
3 IME 411 Engr. Statistics I **or**
MTH 451 Introd. to Probability and Stat.
3 Gen. educ. elective

Senior Year
Second semester: 16 credits

3 CSC 431 Data Structures
3 ELE 437 Computer Communications
4 ELE 444 Electronics III
3 Gen. educ. elective
3 Free elective

Professional electives are three courses from ELE 313, 314, 322, 323, 331, and one 300-500-level course in CSC or ELE; or MTH 316, 418, 452, 462, 471, 472, or IDE 432, 433.

For requirements in humanities and social sciences see "Minimum Requirements" under Electrical Engineering.

Electrical Engineering

The Department of Electrical Engineering offers a curriculum leading to the Bachelor of Science (B.S.) degree. The Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) degrees offered by the department are described in the *Graduate School Bulletin*.

Faculty: Professor Lindgren, *chairperson.* Professors Daly, Jackson, Lengyel, Mardix, Mitra, Polk, Sadasiv, Spence, and Tufts; Associate Professors Boudreaux-Bartels, Kay, Kumaresan, Ohley, Sunak, Swaszek, and Vaccaro; Assistant Professors Fisher and Sun; Adjunct Professor Karlson; Adjunct Associate Professors Aaron and Banerjee; Adjunct Assistant Professors Aidala, McCollough, Most, Pridham, and Williams.

Due to limited facilities and staff, transfers from University College to the undergraduate programs in Computer Engineering and Electrical Engineering will be limited to a total of 90.

Applications for transfer to the College of Engineering will be considered in June for students who wish to be admitted for the following fall semester. Students must complete transfer applications in University College and submit them to the Associate Dean of Engineering by May 1. Admissions will be considered by the Associate Dean, in consultation with the Undergraduate Affairs Committee in Electrical Engineering. Admission decisions will be based on cumulative quality point averages in MTH 141, 142; PHY 213, 285; CHM 101, and CSC 201. Students with quality point averages of less than 2.50 in these courses are advised that there is little chance for admission to Electrical Engineering or Computer Engineering.

The Department of Electrical Engineering will no longer admit students into its sophomore courses who have not been formally admitted into Electrical Engineering or Computer Engineering.

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 bio-engineering.

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 such diverse enterprises 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. Computer hardware and software development 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 which 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 prerequisites have been satisfied.

For transfer from the 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* (see below) with a grade average of 2.00 or better.

Minimum Requirements

Humanities, and Social Sciences. (27 credits) The student will satisfy the University's General Education requirement as well as meet the requirements of the Accrediting Board for Engineering and Technology by completing 6 credits in Fine Arts and Literature, 6 credits in English Communication, 6 credits in Social Sciences, 6 credits in Letters, and 3 credits in Foreign Culture. In two of the three specific groups — Fine Arts and Literature, Social Sciences, and Letters — both courses chosen must be in the same major and must be selected from a list provided by the Electrical Engineering Department. ECN 125 required in the freshman year may be included as one of the social sciences.

Mathematics. (18 credits) MTH 141, 142, 243, 362, 363; 3 cr. MTH elective (215, any 300-500-level course except MTH 381).

Basic Sciences. (20 credits) CHM 101/102; basic science elective (any course in CHM, BIO, GEL, ESC, PHY or ZOO approved by the department), PHY 213, 285, 223, 341, thermodynamics (PHY 420 or MCE 341).

Computer Science. (3 credits) CSC 201.

Engineering Sciences and Design. (53 credits) MCE 263; ELE 205, 210, 214, 211, 212, 313, 314, 322, 323, 331, 342, 443; two electrical engineering electives, one electrical engineering lab course, engineering elective (nonelectrical).

Professional Elective. (3 credits)

Free Elective. (3 credits)

The major requires 127-128 credits.

Freshman Year
First semester: 16 credits

3 CHM 101 Gen. Chemistry I
1 CHM 102 Lab.
3 MTH 141 Introd. Calc. with Anal. Geometry
3 ECN 125 Economic Principles
3 CSC 201 Introd. to Computing
3 Gen. educ. elective

Freshman Year
Second semester: 16 credits

3 Basic science elective[9]
3 MTH 142 Intermed. Calc. with Anal. Geometry
4 PHY 213 Elem. Physics I and 285 Physics Lab.
6 Gen. educ. electives

[9]Must be approved by department advisor.

Sophomore Year
First semester: 16 credits

3 MTH 243 Calc. and Anal. Geom. of Several Variables
3 ELE 210 Introd. to Electr. and Magnetism
3 PHY 223 Introd. to Acoustics and Optics
3 ELE 211 Linear Syst. and Circuit Theory I
1 ELE 214 Circuits Lab. I
3 Gen. educ. elective

Sophomore Year
Second semester: 16 credits

3 MTH 362 Adv. Engr. Mathematics I
3 PHY 341 Modern Physics
3 ELE 212 Linear Syst. & Circuit Theory II
1 ELE 215 Circuits Lab. II
3 ELE 205 Microprocessor Lab.
3 MCE 263 Dynamics

Junior Year
First semester: 15 credits

3 MTH 363 Adv. Engr. Mathematics II
3 ELE 313 Linear Systems
3 ELE 322 Electromagnetic Fields I
3 ELE 331 Elec. Engr. Materials I
3 Gen. educ. elective

Junior Year
Second semester: 16 credits

3 PHY 420 Introd. to Thermodynamics or MCE 341 Thermodynamics
3 ELE 314 Linear Systems and Signals
3 ELE 323 Electromagnetic Fields II
4 ELE 342 Electronics I
3 Gen. educ. elective

Senior Year[10]
Total credits for 2 semesters: 32–33

5 ELE 443 Electronics II
6 Two ELE electives[11]
3-4 Electrical Lab. Course[12]
3 Professional elective[13]
3 Engr. elective[14]
3 Mathematics elective (215, any 300–500-level course except MTH 381)
6 Gen. educ. electives[15]
3 Free elective

Cooperative work in industry carrying academic credit (ELE 495, 496) is available for a few particularly talented and motivated students who are willing to devote more than average effort to their studies and who are capable of much better than average performance.

The Department of Electrical Engineering offers a five-year B.S.-M.S. cooperative program. Academic coursework is alternated between periods of engineering practice at companies or government laboratories selected by the department.

A total of 14 months of industrial experience is obtained in three segments: (1) 3 months, summer between sophomore and junior year; (2) 3 months, summer between junior and senior year: ELE 495 (3 credits); (3) 8 months, second semester of senior year plus the following summer: ELE 496 (6 credits).

The three assignments are usually, but not necessarily, taken at the same company. The industrial experience grows in technical complexity as the student progresses through the program, with the first industrial experience having a small technical content and the eight-month period at the end of the senior year being a junior engineering position. The student earns credit toward his or her degree for the work done and experience gained during the second and third assignments.

Students interested in this program should contact Dr. J.C. Daly, the department's cooperative work coordinator.

Students who are not in the cooperative B.S.-M.S. program may offer no more than three credits of ELE 495 toward their B.S. degree requirements. It will be credited as a professional elective or as a free elective.

Industrial and Manufacturing 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 Master of Science (M.S.) degree, also offered by the department, is described in the *Graduate School Bulletin*.

Faculty: Professor Boothroyd, *chairperson*. Professors Dewhurst, Knight, and Nichols; Associate Professors Lawing and Shao; Adjunct Professors Olson and Reynolds.

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, 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 which are becoming increasingly important in efforts to improve industrial productivity in the USA.

The curriculum also provides an excellent background for further formal study at an advanced level.

The major requires 136 credits.

Freshman Year
First semester: 17 credits

4 CHM 101, 102 Chem. Lecture and Lab.
3 CSC 201 Computer Science I
3 ECN 125 Economics
1 EGR 102 Graphics
3 MTH 141 Calculus I
3 Gen. educ. elective

Freshman Year
Second semester: 16 credits

3 CSC 202 Computer Science II
3 ECN 126 Economics
3 MCE 162 Statics
3 MTH 142 Calculus II
4 PHY 213, 285 Physics Lecture and Lab.

Sophomore Year
First semester: 16 credits

3 IME 220 Introd. to Industrial Engr.
3 MCE 263 Dynamics
3 MTH 243 Calculus III
4 PHY 214, 286 Phys. Lecture and Lab.
3 Gen. educ. elective

Sophomore Year
Second semester: 18 credits

3 ACC 201 Accounting I
3 CVE 220 Mechanics of Materials
3 ELE 220 Circuits
3 IME 240 Manufacturing Processes
3 MTH 362 Adv. Engr. Math. I
3 Gen. educ. elective

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[10]See your advisor for help in the preparation of suitable senior year programs.

[11]ELE electives must be at 400-500 level.

[12]ELE Lab courses are ELE 401, 427, 432, 444, and 458.

[13]Professional elective is any course at 300-500 level in engineering, computer science, natural science, or mathematics.

[14]Engineering electives are: MCE 323, 354, 448; CVE 220; IME 404, 411, 412; CHE 332, 347, 437, and OCE 410.

[15]ECN 125 plus 24 credits of approved electives are required to satisfy General Education and ABET requirements.

Junior Year
First semester: 18 credits

3 CHE 333 or 437 Materials Engr.
3 IME 404 Engr. Economy
3 IME 411 Probability for Engineers
3 IME 432 O.R. Determin. Models
3 IME 443 Machining and Machine Tools
3 MCE 341 Thermodynamics

Junior Year
Second semester: 18 credits

3 IME 412 Statistics for Engineers
3 IME 433 O.R. Stochastic Models
3 IME 441 Metal Casting
3 MCE 354 Fluid Mechanics
3 Professional elective
3 Gen. educ. elective

Senior Year
First semester: 18 credits

3 IME 450 Ind. Engr. Systems Design I
3 IME 446 Metal Deform. Process
3 Quant. or Materials elective[16]
3 Approved science elective[17]
6 Gen. educ. elective

Senior Year
Second semester: 15 credits

3 IME 444 Assembly and Handling Autom.
3 IME 449 Prod. Design for Mfg.
3 Quant. or Materials elective
3 Free elective
3 Gen. educ. elective

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.

Materials Engineering

The Department of Chemical Engineering offers a curriculum leading to the Bachelor of Science (B.S.) degree in materials engineering.

Faculty: Chemical Engineering faculty; *coordinator:* Professor Rockett.

Graduates will be prepared to continue studies on the post-baccalaureate level in materials engineering, materials science, or chemical engineering, or to enter employment in industries and government agencies where production and research are underway in the development, processing, and marketing of products involving traditional or new uses of metals, alloys, ceramics, composites, polymers, and semiconductors. Products range from large turbines to computer chips. Employment opportunities include basic research, applied research and testing, product design, troubleshooting, pollution control, process supervision, government regulation, economic analysis, quality control, management, and engineering sales.

The materials engineering program begins with mathematics, chemistry, and physics courses common to many of the other engineering programs, and General Education requirements. In the sophomore and junior years, many traditional engineering science areas are treated, along with basic courses in materials science and additional chemistry courses. In the final year, the application and synthesis of topics previously studied are incorporated into formal courses and project courses. Considerable leeway is allowed at this level in the choice of project topics and courses in specialized areas of materials engineering.

The major requires 126 credits.

Freshman Year
First Semester: 15 credits

5 CHM 191 Gen. Chemistry
1 CHE 101 Foundations of Chemical Engr.
3 MTH 141 Introd. Calc. with Anal. Geometry
6 Gen. educ. electives

Freshman Year
Second Semester: 15 credits

5 CHM 192 Gen. Chemistry
3 MTH 142 Intermed. Calc. with Anal. Geometry
3 PHY 213 Elem. Physics
1 PHY 285 Physics Lab.
3 ECN 125 Economic Principles

Sophomore Year
First Semester: 16 credits

3 CHE 212 Chemical Process Calculations
3 CHM 227 Organic Chemistry
3 MTH 243 Calc. of Functions of Several Variables
3 PHY 214 Elem. Physics
1 PHY 286 Physics Lab.
3 MCE 162 Statics

Sophomore Year
Second Semester: 15 credits

3 CHE 272 Introd. to Chemical Engr.
3 CHE 332 Physical Metallurgy
3 CHM 228 Organic Chemistry
3 CVE 220 Mechanics of Materials
3 MTH 244 Differential Equations

Junior Year
First Semester: 18 credits

3 CHE 313 Chem. Engr. Thermodynamics
3 CHE 347 Transfer Operations I
3 CHE 437 Materials Engr.
3 CHM 431 Physical Chemistry
3 MTH 215 Introd. to Linear Algebra
3 Gen. educ. elective

Junior Year
Second Semester: 17 credits

3 CHE 314 Chem. Engr. Thermodynamics
2 CHE 322 Chem. Engr. Micro. Lab.
3 CHE 348 Transfer Operations II
3 ELE 220 Passive and Active Circuits
6 Gen. educ. electives

Senior Year
First Semester: 18 credits

3 CHE 351 Plant Design and Economics
3 CHE 439 Nondestructive Testing
3 IME 411 Probabililty for Engineers
3 Engr. science elective (Materials)
3 Design elective (Materials)
3 Gen. educ. elective

Senior Year
Second Semester: 15 credits

3 CHE 492 Special Problems (Design, Materials)
3 CHE 534 Corrosion and Corr. Control
3 Engr. science elective (Materials)
6 Gen. educ. electives

Mechanical Engineering and Applied Mechanics

The Department of Mechanical Engineering and Applied Mechanics offers a curriculum leading to the Bachelor of Science (B.S.) degree in mechanical engineering, which is accredited by the Accreditation Board for Engineering and Technology (ABET) 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 ocean engineering option, which is also accredited

[16]Two courses must be selected from the following list of courses: IME 500, 513, 514, 525, 533, 535, 540, 542, 545, 550, 555; MTH 335. Any 400-level MTH course *except* MTH 451, 452, 465. IME 517, 541; ELE 331, 582; OCE 534; CHE 532, 533, 537, 539, 573; MCE 426, 550, PHY 455.

[17]Any course for which the prerequisite is met by CHM 101 or PHY 214 or any course in astronomy, biochemistry and biophysics, biology, botany, geology, microbiology, or zoology. Course must be approved by advisor.

by ABET. The Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) degrees also offered by the department are described in the *Graduate School Bulletin*.

Faculty: Professor T.J. Kim, *chairperson*. Professors G. Brown, DeLuise, Ferrante, Ghonem, Goff, Hagist, Henderson, Lessmann, Nash, Palm, Sadd, Shukla, Test, Viets, M. Wilson, and F. White; Associate Professors Datseris and Faghri; Assistant Professors Olson, Reuber, and Taggart; Adjunct Professors Dunlap, McEligot, Messier, Patton, Rodman, and Schenck.

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. Mechanical engineers are employed in large numbers in every industry where they frequently assume positions of leadership. The program at The University of Rhode Island is unusually strong in providing a background in systems engineering, design, fluids, and the thermal sciences including energy and energy transfer. Computer applications are stressed throughout the curriculum. All undergraduates are invited to join the Student Section of the American Society of Mechanical Engineers which sponsors industrial plant visits, special lectures, and other activities.

The work in the first two years consists of basic courses in science (mathematics, physics, chemistry), applied science (mechanics, electricity and magnetism, computer science, theory of mechanisms), and general education (humanities, social sciences, communication).

The junior year concentrates on fundamental courses in mechanical engineering (thermodynamics, fluid mechanics, systems engineering, engineering analysis), materials science, and electronic devices. Further general education studies are also covered.

The senior year in mechanical engineering includes machine design, heat transfer, manufacturing processes, computer-aided 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, lubrication and bearings, thermal environmental engineering, vibrations, finite element method, and experimental stress analysis.

Throughout the program the student takes an integrated series of laboratory courses which introduce laboratory techniques and provide practical experience with the physical and engineering phenomena being covered in concurrent courses. Digital computer techniques are included. The Academic Computer Center's IBM 4381-3 mainframe and two Prime 9955 are used. Students also use the College of Engineering's VAX-8600 and Prime 9955 computer graphics facilities and microcomputers.

To receive the Bachelor of Science degree in mechanical engineering, the student must satisfactorily complete all the courses in the following curriculum. The curriculum shown below is for the class of 1991 and subsequent classes. Students in the classes of 1989-90 should obtain a check sheet from their advisors.

The major for the classes of 1991 and subsequent classes requires 133 credits.

Students desiring an undergraduate specialization in ocean engineering may choose the program in mechanical engineering with ocean engineering option. Students enrolled in this option must follow the program of study of mechanical engineering during the freshman and sophomore years. The junior and senior years' curriculum for this major is listed under Ocean Engineering. All students enrolled in the Mechanical Engineering curriculum must have credit for CSC 201, or the equivalent, before taking 200 or higher level MCE courses.

This curriculum totals 133 credits.

Freshman Year
First semester: 16 credits

4 CHM 101 Gen. Chemistry I and CHM 102 Lab.
3 MTH 141 Introd. Calc. with Anal. Geometry
3 ECN 125 Economic Principles
3 CSC 201 Introd. to Computing
3 Gen. educ. elective

Freshman Year
Second semester: 16 credits

3 MTH 142 Intermed. Calc. with Anal. Geometry
3 MCE 162 Statics
4 PHY 213, 285 Elem. Physics
6 Gen. educ. electives

Sophomore Year
First semester: 17 credits

3 CVE 220 Mechanics of Materials
3 MTH 243 Calc. and Anal. Geometry of Several Variables
3 MCE 263 Dynamics
4 PHY 214,286 Elem. Physics
1 MCE 220 Comp. Graphics in Mech. Engr.
3 Gen. educ. elective

Sophomore Year
Second semester: 18 credits

3 ELE 220 Passive and Active Circuits
3 MTH 244 Differential Equations
3 MCE 323 Kinematics
3 PHY 341 Modern Physics
6 Gen. educ. electives

Junior Year
First semester: 15 credits

3 CHE 333 Engr. Materials
3 ELE 221 Electronic Instrum. and Electromech. Devices
3 MCE 341 Fundamentals of Thermodynamics
3 MCE 372 Engr. Analysis I
3 Gen. educ. elective

Junior Year
Second semester: 18 credits

3 MCE 317 Mechanical Engr. Exp. I
3 MCE 342 Mechanical Engr. Thermodynamics
3 MCE 354 Fluid Mechanics
3 MCE 366 Introd. to Systems Engr.
3 MCE 373 Engr. Analysis II
3 Gen. educ. elective

Senior Year
First semester: 18 credits

3 IME 440 Manufacturing Processes
3 MCE 318 Mechanical Engr. Exp. II
3 MCE 423 Design of Machine Elements
3 MCE 448 Heat and Mass Transfer
6 Professional electives[18]

Senior Year
Second semester: 15 credits

3 MCE 429 Comprehensive Design
3 MCE 430 Computer-Aided Design
6 Professional electives[18]
3 Free elective

[18]The requirement for professional electives must be satisfied by a minimum of three three-credit elective courses in mechanical engineering and the fourth course must be a 300-, 400-, or 500-level course offered by the College of Engineering, except OCE 346 and 347,or by the computer science, chemistry, or physics departments or a 400-, or 500-level course offered by the mathematics department.

Ocean Engineering

The Department of Chemical Engineering, the Department of Civil and Environmental Engineering, and the Department of Mechanical Engineering and Applied Mechanics offer curriculums leading to the Bachelor of Science (B.S.) degree in chemical and ocean engineering, civil engineering with ocean engineering option, or mechanical engineering with ocean engineering option in cooperation with the graduate Department of Ocean Engineering. The Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) degrees in ocean engineering are described in the *Graduate School Bulletin.*

Faculty: Professor Silva, *chairperson.* Professors Kowalski, LeBlanc, Rose, Spaulding, Stepanishen, and White; Associate Professors Brown, Cornillon, Tyce, and Wright; Assistant Professor Hu; Research Assistant Professor Tucker; Adjunct Professors Mayher and Shonting; Emeriti Professors Middleton, Nacci, and Sheets.

Chemical and Ocean Engineering. Students enrolled in this curriculum will follow the program of study for chemical engineering (page 56) during the freshman, sophomore, and junior years.

The major requires 133 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[19]
3 CHE 403 Introd. to Ocean Engr. Processes I
3 CHE 464 Industr. Reaction Kinetics
3 OCE 410 Basic Ocean Measurements
3 Gen. educ. elective[20]

Senior Year
Second semester: 18 credits

3 CHE 352 Plant Design and Economics[19]
3 CHE 404 Introd. to Ocean Engr. Processes II
3 CHE 534 Corrosion and Corr. Control
3 OCG 401 Gen. Oceanography
6 Gen. educ. electives[20]

Civil Engineering with Ocean Engineering Option. Students enrolled in this curriculum will follow the program of study for civil engineering (page 57) during the freshman and sophomore years.

The curriculum requires 137 credits.

Junior Year
First semester: 19 or 20 credits

2 CVE 322 Civil Engr. Lab. **or**
3 Gen. educ. elective
3 MCE 354 Fluid Mechanics
3 CVE 352 Structural Analysis and Design I
4 CVE 374 Environmental Engr. I
3 OCG 401 General Oceanography
4 CVE 381 Geotechnical Engr.

Junior Year
Second semester: 17 or 18 credits

2 CVE 322 Civil Engr. Lab **or**
3 Gen. educ. elective
4 CVE 347 Highway Engr.
3 CVE 353 Structural Analysis and Design II
4 CVE 370 Hydraulic Design
3 CVE/OCE 406 Introd. to Ocean and Coastal Engr.
1 CVE 304 Introd. to Professional Practice

Senior Year
First semester: 17 credits

3 Approved math. elective
3 Gen. educ. elective
3 CVE 495 Civil Engr. Systems **or** professional elective
3 CVE 465 Anal. and Design of Concr. Struct.
3 CVE/OCE 411 Basic Coastal Measurements
1 CVE 491 Special Problems: Project in Civil and Ocean Engr.
1 CVE 305 Introd. to Professional Practice

Senior Year
Second semester: 18 credits

3 CVE/OCE 407 Project in Ocean Engr.
3 Professional elective
3 CVE 495 Civil Engr. Systems **or** professional elective
3 Approved statistics elective
3 Gen. educ. elective
3 Free elective
0 CVE 306 Introd. to Professional Practice

Mechanical Engineering with Ocean Engineering Option. Students enrolled in this curriculum will follow the program of study for mechanical engineering during the freshman and sophomore years. This curriculum requires 136 credits. The junior and senior years for the class of 1991 and subsequent classes are shown below.

Junior Year
First semester: 15 credits

3 CHE 333 Engr. Materials
3 ELE 221 Electronic Instrum. and Electromech. Devices
3 MCE 341 Fundamentals of Thermodynamics
3 MCE 372 Engr. Analysis I
3 OCG 401 General Oceanography

Junior Year
Second semester: 18 credits

3 MCE 317 Mechanical Engr. Exp. I
3 MCE 342 Mechanical Engr. Thermodynamics
3 MCE 354 Fluid Mechanics
3 MCE 366 Introd. to Systems Engr.
3 MCE 373 Engr. Analysis II
3 Gen. educ. elective

Senior Year
First semester: 18 credits

3 IME 440 Manufacturing Processes
3 MCE 401 Introd. to Ocean. Engr. Systems I
3 MCE 410 Basic Ocean Measurements
3 MCE 423 Design of Machine Elements
3 MCE 448 Heat and Mass Transfer
3 PHY 425 Acoustics

Senior Year
Second semester: 18 credits

3 MCE 402 Introd. to Ocean Engr. Systems II
3 MCE 429 Comprehensive Design
3 MCE 430 Computer-Aided Design
3 Professional elective[21]
3 Free elective
3 Gen. educ. elective

[19]CHE 351, 352 will include applications to ocean engineering problems for students selecting the chemical and ocean engineering program.

[20]At least 18 credits of the General Education electives must be chosen from a group approved by the department, with the approval of the advisor designated by the department.

[21]The requirement for professional elective must be satisfied by a three-credit elective course in mechanical engineering.

College of Human Science and Services

Barbara Brittingham, *Dean*
Leo E. O'Donnell, *Associate Dean*
M. Thelma Kenyon, *Assistant Dean for Administration*

The College of Human Science and Services is a people-oriented college designed to focus on the human and nonhuman resources needed to help individuals and groups solve human problems encountered in contemporary society. Programs in the college provide training for professionals to assess human problems and to develop the helping skills necessary for the effective delivery of human services to individuals and groups in need. These programs include both formal and informal experiences with people in a wide variety of public service settings and enable students to develop the competencies needed in the emerging field of human services.

The degrees offered by the college include: (1) a Bachelor of Science degree with majors in communicative disorders, consumer affairs, dental hygiene, elementary and secondary education, human development and family studies, human science and services, physical education, textiles, fashion merchandising and design, and textile marketing; (2) a Bachelor of Science degree in Home Economics with a major in home economics; (3) an Associate in Science degree in Dental Hygiene.

The college is composed of six departments and a Division of Interdisciplinary Studies.

The Institute of Human Science and Services, the research and service branch of the college, promotes these activities in human service areas across all departments of the college. The institute conducts research in education and educational testing, lifelong learning, human transition, child development, communicative disorders, special populations, gerontology, and exercise physiology. Faculty who are involved in the research of the institute also teach within the various departments of the college.

The college sponsors a number of organizations and activities which provide special opportunities for students:

URI Clearinghouse for Volunteers is a service which matches prospective volunteers with positions in Rhode Island's human service agencies, giving students opportunities to explore career options and provide needed service.

Human Performance Laboratory is equipped with the latest means of measuring physical activity and its stresses and effects; has programs for adult fitness; research programs related to fitness, sport, and nutrition.

Child Development Center is a modern facility that provides programs of day care and preschool; offers opportunities for undergraduate students to observe and learn to work with young children.

Microcomputer Laboratory contains a variety of up-to-date microcomputers; emphasis on software designed for use in elementary and secondary classrooms.

Historic Costume and Textile Collection, a teaching collection of over 12,000 items, emphasizes historic New England clothing and textile products. Items range from mummy wrappings to modern design collections.

Speech and Hearing Clinic supports over 2,000 client visits per year in the areas of speech and hearing assessment and therapy; provides observational, clinical, and research support for Communicative Disorders.

Dental Hygiene Clinic offers preventive services to persons 18 years or older. Services include a dental prophylaxis, x-ray films, and patient education.

Faculty

Communicative Disorders Faculty: Associate Professor Singer, *chairperson.* Professor Beaupre; Associate Professors Culatta, Grubman-Black, Hurley; Clinical Assistant Professor Regan; Adjunct Assistant Professor Singer; Clinical Coordinator Connors.

Dental Hygiene Faculty: Professor Wilson, *chairperson.* Associate Professor Brown; Assistant Professor Saunders; Adjunct Professor Yacovone; Clinical Instructors Aschaffenburg, Bhattacharya, Bliss, Brown, Coletti, Corner, Feldman, George, Gooding, Howarth, Kershaw, Mier, Mullane, Ross, Schwab, Sullivan, and Varone.

Education Faculty: Associate Professor Nelson, *acting chairperson.* Professors Croasdale, P. Kelly, W. Kelly, Long, MacMillan, Pezzullo, Purnell, Russo, and Willis; Associate Professors Allen, Brittingham, Kellogg, McKinney, Nelson, Soderberg, and Sullivan; Assistant Professors Boulmetis, O'Neill, and Trostle; Adjunct Professors Knott and Tierney.

Human Development, Counseling, and Family Studies Faculty: Professor Cohen, *chairperson.* Professors Fitzelle, Maynard, Spence, and Rae; Associate Professors Clark, Gunning, and Schaffran; Assistant Professors Anderson, Blood, Christner, Frank, Kalymun, Noring, Richmond, and Schroeder; Adjunct Professor Guthrie.

Physical Education, Health and Recreation Faculty: Associate Professor Crooker, *chairperson.* Professors Bloomquist, Manfredi, Nedwidek, and Sonstroem; Associate Professors Cohen, Crooker, DelSanto, O'Donnell, O'Leary, Piez, Robinson, Rowinski, Seleen, and Sherman; Assistant Professors Fernhall, Henni, and Norris; Special Instructors Marsden, McAniff, and Vanner; Adjunct Associate Professor Lemaire; Clinical Coordinators Congdon and McArdle.

Textiles, Fashion Merchandising and Design Faculty: Associate Professor Helms, *chairperson.* Associate Professors Higa and Welters; Assistant Professors Cerny and Kyllo; Curator Kaye.

Division of Interdisciplinary Studies Faculty: Gerontology: Professor Spence, *program head;* Consumer Affairs: Assistant Professor Christner, *program head;* Human Science and Services: Associate Professor McKinney, *program head;* Urban Affairs: Assistant Professor Noring, *program head;* Special Populations: Associate Professor Crooker, *program head.*

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 page 9.

Individual programs may require specific courses for their area.

English Communication (6 credits) A minimum of 3 credits in written communication from courses in Group Cw; a minimum of 3 credits in oral communication from SPE 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 3 credits from psychology, sociology, or anthropology courses approved for General Education.

Total: 39 credits.

Division of Interdisciplinary Studies. This division provides an environment in which faculty and students may bring together interdisciplinary programs and courses of study in human science and services. The division functions to promote and encourage the creation, implementation, and evaluation of interdisciplinary courses and programs of study taught by faculty from two or more departments within the University. In addition, the division assumes responsibility for the development, review, and implementation of programs of study which draw significantly on two or more human science and services departments. The division maintains administrative responsibility for the following programs: Home Economics (see page 67); Human Science and Services (see page 68); Consumer Affairs (see page 66); Gerontology (see page 10); and Special Populations (see page 11).

Minors: Interdisciplinary Nondegree Programs. Students may 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. 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 minor fields 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 grading 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.

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 34 semester hours in communicative disorders includes 21 semester hours of required courses and 9 semester hours of professional electives.

The required courses are CMD 260, 261, 372, 373, 374, 375, 376, and 465. The remaining 9 credit hours (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: HCF 200, 201, 450; PSY 232, 235.

Area B (0-3 credits). Special Populations: CMD 475 (2 credits); HCF 220; PSY 254, 442.

Area C (0-3 credits). Supportive Disciplines: EST 220; EDC 312, 424; HSS 320; LIN 201; PSY 300, 386; SPE 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, majors may use free electives to achieve a double major or to explore special interest areas in depth. Students anticipating graduate study in speech-language pathology or audiology are encouraged to discuss admissions requirements and programs of study with this goal in mind. The curriculum is personalized for each student and closely supervised by the student's advisor.

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 coursework and clinical practicum during their senior year, and complete the master's degree in one additional year of full-time graduate study. A cumulative grade point average of 3.00 and 3.20 in the major is required, with MAT or GRE scores in at least the 50th percentile. Three let-

ters 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 specified coursework and practicum credits (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.A. and M.S. degrees in Speech-Language Pathology or Audiology are outlined in the *Graduate School Bulletin*.

Consumer Affairs

This curriculum leads to the Bachelor of Science (B.S.) degree in consumer affairs. This interdisciplinary program within the Division of Interdisciplinary Studies provides a general background for students who wish to develop effective strategies for dealing with complex social and economic systems relating to consumer concerns. Coursework in consumer affairs is combined with selected courses in business, economics, political science and related areas. Field experience and internships are an integral part of the program.

Graduates with this degree may choose careers in consumer affairs in business, social service agencies, local or state government consumer protection agencies, Cooperative Extension Service, and consumer education.

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: MTH 109, ECN 125, 126, and CNS 220.

The following courses are required of all students (some may be used to help fulfill the General Education requirements): SPE 101, 210, or 215; ECN 125, 126; PSC 113, 422; MTH 109, 111, or 141; EST 408 or 409; CNS 422, MKT 415, EST 412 or REN 440; PSY 113; SOC 100 or 102; SOC 204 or PSY 335; and PHL 117, MKT 321, MGT 380, PSC 368 or JOR 110.

In addition, 30 credits of consumer affairs courses must be taken, of which the following are required: CNS 220, 320, 420; MKT 311, BSL 333, ECN 302 or 337; and a field experience (minimum of 3 credits of CNS 477 or 478, or MKT 491 or 492, or UYA 301 or 302). The other 12 credits must be selected from consumer-related courses selected in consultation with an advisor.

Students are also required to take 15 credits for professional electives. Selection should be made in consultation with a faculty member of the Consumer Affairs Advisory Committee by the end of the fifth semester.

A total of 128 credits is required for graduation.

Dental Hygiene

The Department of Dental Hygiene offers a four-year program leading to the Bachelor of Science (B.S.) degree and a two-year program leading to the Associate in Science (A.S.) degree. Both are accredited by the Commission on Dental Accreditation.

BACHELOR OF SCIENCE

This curriculum offers maximum flexibility in providing professionally oriented study and a foundation in General Education. It is designed to prepare the students to assume responsible positions in education, such as in schools of dental hygiene, hospital programs, and school systems as well as private practice. Students who complete this curriculum are prepared to continue with graduate study.

Upon completion of the required 71 credits in dental hygiene, the student is awarded the Associate in Science degree. A total of 125 credits is required for the Bachelor of Science degree. At the completion of the first clinical year, students are placed in private dental offices for one month of field training experience.

The required professional courses are made up of the elements which contribute directly to the skill and understanding of dental hygiene and are required in the professional sequence.

A major of 30 credits in dental hygiene includes: DHY 101 (1), 125 (3), 135 (1), 141 (1), 126 (3), 128 (1), 136 (2), 227 (3), 231 (2), 237 (2), 238 (2), 244 (1), 248 (2), 250 (3), 252 (3).

In addition, candidates for the Bachelor of Science degree are required to take the following: CHM 101, 102 or 103, 105 (4), 124 (3), 126 (1), WRT 101 (3), 201 (3), ZOO 121 (4), 242 (3), 244 (1), HLT 172 (1), MIC 201 (4), SOC 100 (3), 204 (3), FSN 207 (3), PCL 221 (2), PSY 113 (3), 232 (3), SPE 101 (3), EDC 102 (3), 312 (3), 372 (3), MTH 107 (3); DHY 462 (3) and DHY 464 (3) are strongly recommended.

In addition, students must fulfill the basic liberal study requirements.

ASSOCIATE IN SCIENCE

This two-year curriculum of 71 credits prepares the student to perform ancillary clinical services which contribute to the maintenance of good oral health, educate both children and adults in oral hygiene, and assist the dentist to allow him more time for the treatment of patients.

The program is designed to allow transfer students from other colleges and curriculums to attain the Associate in Science degree. Two months of experience as a dental assistant is recommended for all students entering the dental hygiene program. At the completion of the first clinical year, the student is placed in a private dental office for one month of field training experience.

Freshman Year
First semester: 17 credits

CHM 101, 102 or 103, 105 (4), WRT 101 (3), ZOO 121 (4), DHY 101 (1), 125 (3), 135 (1), and 141 (1).

Freshman Year
Second semester: 18 credits

WRT 201 (3), CHM 124 (3), 126 (1), ZOO 242 (3), 244 (1), HLT 172 (1), DHY 126 (3), 128 (1), and 136 (2).

Sophomore Year
First semester: 19 credits

MIC 201 (4), SOC 100 (3), FSN 207 (3), PCL 221 (2), DHY 227 (3), 231 (2), and 237 (2).

Sophomore Year
Second semester: 17 credits

PSY 113 (3), SPE 101 (3), DHY 238 (2), 244 (1), 248 (2), 250 (3), 252 (3).

Education

The curriculums in elementary and secondary teacher education lead to the Bachelor of Science (B.S.) degree. The Master of Arts (M.A.) degree programs in education are described in the *Graduate School Bulletin*.

The curriculums offer a balanced program of academic preparation and professional training. The required professional courses contribute directly to understanding the teachers' role in society

and to the development of teaching skills.

The program in Elementary Education is separated into two distinct tracks. Successful completion of the first of these tracks, Early Childhood Education, leads to an initial teaching certificate for the primary grades (N-2), while completion of the second track, Elementary Education (Standard), leads to an initial teaching certificate for grades 1-6.

Due to limited staff and facilities, admission to the programs in Elementary Education and Early Childhood Education is limited. Although cumulative averages are not the sole criterion for admission, students with quality point averages of less than 2.50 are advised that there is little chance for admission to these programs. A description of the policies and procedures for acceptance into education programs appears later in this section.

Students electing the Early Childhood Education program, in addition to their professional sequence courses, are required to complete a second major in the Human Development, Counseling, and Family Studies Department (HCF). Students should confer with an advisor from HCF early in their programs. Professional sequence courses required for the Early Childhood Education program are: EDC 102, 250, 312, 424, 426, 429, and HCF 301, 303, 350. These courses are taken prior to student teaching. EDC 484 and 485 comprise the student teaching semester: EDC (MUS) 329 and HCF 302 are strongly advised.

Students electing the Standard Elementary Education program are required to take the following professional sequence. EDC 102, 250, 312, 371, 424, 427, and 428 are taken prior to student teaching. EDC 484 and 485 comprise the student teaching semester: EDC (MUS) 329 is also strongly advised.

The following courses are required in the professional sequence for secondary education: EDC 102, 250, 312, 371, 430, and 448 are taken prior to student teaching. EDC 484 and 485 comprise the student teaching semester.

The following noneducation courses are required of all students and may, where appropriate, be taken to partially fulfill the General Education requirements: elementary education – PSY 113, and PSY 232 or HCF 200; secondary education – PSY 113 and HCF 310.

All students in the department will plan, in cooperation with an advisor, an academic specialization of 27-30 credits. Depending upon the specialization chosen, this may or may not be declared a "double major." The specialization of secondary education students must be in the area for which a teaching certificate is sought. Students in the Early Childhood Education program must declare and complete a second major in Human Development, Counseling, and Family Studies.

Students apply to the department from University College, and should consult with a University College education advisor as early as possible since openings in the program are limited. Below are the policies and procedures for acceptance into the program.

Students should apply for admission to the program in the second semester of their sophomore year and will be accepted on a space-available basis. Applicants are reviewed by a departmental screening committee which will consider the following factors: 1) cumulative QPA of 2.50 or better, 2) grades in academic major or specialization averaging 2.50 or better, 3) grades of B- or better in each of the required communications skills courses, and 4) letters of recommendation and other indications of the student's teaching potential. An interview is also required. A student denied admission to the program may petition the department for a review of the decision and the screening committee shall meet to consider the appeal.

Students must maintain the minimum grade averages specified above and attain a grade of at least C in EDC 430 and 448 (Secondary); EDC 424, 427, and 428 (Elementary); HCF 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 the dismissal from the program.

Depending upon the curriculum chosen, a total of either 120 or 128 credits is required for graduation.

Home Economics

There are three programs in home economics: general home economics, home economics education, and home economics in the urban environment. Each of the three leads to the Bachelor of Science (B.S.) degree in home economics. Interdisciplinary in nature, all three provide for academic work in all areas of home economics as well as in other disciplines. Students are prepared for a broad range of careers in business, journalism, community agencies, housing authorities, consumer protection agencies, and schools.

Students are required to take 40 to 41 credits of home economics core courses including: HCF 200, 330; CNS 220, 340; FSN 150, 207; TMD 103, 216; HSS 320; and HEC 400. Three additional credits must be chosen from specified lists in each of the areas of consumer studies, human development, food science and nutrition, and textiles.

The program in *general home economics* requires 18 credits of professional electives; these should be chosen with the advisor's approval.

Students selecting the program in *home economics education* are required to take EDC 102, 312, 371, 448, 484, 485, and HED 337.

To be eligible for student teaching, a student is required to maintain a 2.50 quality point average in home economics courses and attain at least a C grade in HED 337 Teaching Effectiveness. Failure to meet these two conditions will lead to automatic dismissal from the certification option in the Home Economics Education Teacher Program.

Students choosing *home economics in the urban environment* must select URB 210 and URB 498 or 499, three credits of quantitative methods chosen from a specified list, nine additional credits in urban affairs, plus three additional courses to be chosen with the assistance of an advisor.

Students wishing to major in home economics are strongly encouraged to meet early and often with an advisor to plan their courses of study.

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 *Graduate School Bulletin*. The undergraduate curriculum provides a general background for work with children, families, and adults. Most such professions require academic work beyond the bachelor's

degree for continuing professional work and advancement. Individuals with a baccalaureate degree are employed as professionals, however, in nursery schools, day-care centers, institutions and hospitals, recreational, child guidance, case work, and other community agencies. Some of the courses in this curriculum, plus certain others in education, meet the requirements for the Provisional Early Childhood Certificate in Rhode Island. The Professional Certificate requires successful teaching experience for five years and additional academic work.

Students are required to select and pass HCF 150, 200, 201, 203, or 221, 357, 330, 400 or 420, 430, 310 or 220 or 406, and 450 plus one elective from consumer studies and one from food science and nutrition. In addition, 18 credits of professional electives must be chosen with the help of an advisor; field work does not meet this requirement.

Students who wish to meet the requirement for the Provisional Early Childhood Certificate in Rhode Island must take an additional 36 credits (professional electives included). These courses include HCF 301, 303, and 350 and EDC 102, 250, 312, 424, 426, 429, and Supervised Student Teaching in grades K, 1, and 2. These students will be double majors with the Education Department and must contact their HCF or EDC advisor early in their college career as space in the program is limited. See page 67 for the admission requirements for Early Childhood Education.

A total of 128 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 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 coursework includes PHL 117[1], SOC 102[2], PSY 113[2], ECN 125[2], and PSC 113[2]. A course in ethics is strongly recommended. In addition, students complete a core in human science and services: HCF 200, 201; HSS 222, 320, 350, and a seminar. Each student in the program must also complete two option areas of approximately 18 credits each. Choices of the primary option area include: Adulthood and Aging, Child and Youth Studies, Community Health, Consumer Studies, Educational Studies and Policy, Family Resource Management, Family Studies, Home Economics, Home Economics Education, Housing, Human Development, Instructional Communication, Recreational Program Services, and Textiles and Clothing. A wide range of choices is available for the section option area, many of which allow the student to study allied fields in other colleges at the University. Each option area has specific course requirements (some of which include natural science courses which may be taken as part of General Education); students should check with their academic advisor for a detailed description of the requirements and options.

The program requirements also include a field experience (of at least 6 academic credits), professional electives (12 credits), and free electives (13 credits).

A total of 130 credits is required for graduation.

Physical Education, Health and Recreation

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 *Graduate School Bulletin*.

The major, which has two options, is designed for students who plan to pursue a career within the broad field of health, physical education, recreation, and dance. Students may prepare for certification as public school teachers (Health and Physical Education K-12) with additional study opportunities in elementary and secondary physical education, athletic coaching, athletic training, corrective and adapted physical education, and health education. For those who may be interested in other than school careers, the curriculum offers a nonteaching option with specializations in dance, physical fitness, corrective and adapted physical education, as well as in a variety of individual interdisciplinary areas.

Regardless of which of the two major program options the student is pursuing, the following courses are required of all majors: PED 217, 270, 369, 370, physical activity majors practicum (8 credits), HLT 272, BIO 101, 102, chemistry or physics (3 credits), ZOO 121, 242, 343, PSY 113, 232, and EDC 312.

All students are also required to complete a minimum of eight practicum credits. All students must take one credit from PED 130, 230, 330, 340, 346, 347, or 430; one credit from PED 131, 133, 140, 153, 160, 233, 234, 235, 242, 251, 253, or 260; and one credit from PED 120. Students enrolled in the teacher certification option must complete five additional credits taken from the following: one credit from PED 321; one credit from PED 222 or 223; one and one-half credits from PED 115 A-H; and one and one-half credits from PED 215 A-G. Students enrolled in the non-teacher certification option must complete five additional credits taken from any major practicum or basic instruction activity course in consultation with, and approval of, their advisor.

In addition to the credit requirements in PED 115 and 215, all students enrolled in the teacher certification option must demonstrate proficiency in a minimum of four activitites in each of the two courses. Proficiency may be demonstrated by (1) the successful completion of an additional major practicum course; or (2) passing a proficiency examination administered and verified by a designated examiner; or (3) participation as a member in a varsity or club sport at the University. Participation must be verified in writing by the head coach.

Additionally, all majors pursuing the B.S. degree in physical education must complete a three-day camping experience at the W. Alton Jones Campus. All incoming freshmen should check with their University College advisor for further

[1]May be taken as part of General Education (Letters).

[2]Two of these courses may be taken as part of General Education (Social Science).

details. The current fee is $50 per student, and includes all meals, instruction, and overnight lodging for two nights.

Teacher Certification Option. This option is designed for students seeking teacher certification in health and physical education at the elementary and secondary school level. The curriculum allows a broad exploration of subject area, but is flexible enough to provide additional areas of study in teaching, coaching, athletic training, corrective and adapted physical education, and health. Completion of the NASDTEC-approved certification program fulfills the requirement for teacher certification in the state of Rhode Island and 39 additional states.

Within the teacher certification option, the following courses are required in addition to those required of all majors: PED 295, 314, 315, 324, 380, 410; HLT 367, 377; 12 credits from EDC 486, 487, 488, 489; EDC 485, 8 credits of professional electives, and 11 credits of free electives.

All students must maintain a grade point average of 2.70 in all physical education, health, and recreation coursework prior to the student teaching semester.

Non-Teacher Certification Option. This option is designed for students seeking preparation for careers in community and agency settings. The option provides additional opportunity for specializations in (1) dance, (2) physical fitness, (3) corrective and adaptive physical education, and (4) interdisciplinary areas of interest.

In addition to the requirements listed above for all physical education majors, students in the nonteacher option are required to take: RCR 280, HLT 123, three credits of seminar, 12 credits of supervised field work (PED, RCR, or HLT 486), 18-24 credits of specialized work, and 16 credits of free electives.

Students selecting dance as a specialization must take PED 131, 140, 160, 242, 260, 324, 466; two credits from PED 133, 153, 233, 234, 235, 251, 253; and six credits from PHL 355, PED 391, oral interpretation speech, theatre, art, or music course. Courses applied to this option must be in addition to the courses applied toward the major practicum requirement in dance.

Students selecting the physical fitness specialization must take FSN 207, PED 243, 275, 391, and six credits from ACC 201, 202, BED 227, HCF 150, 220, 450, MGS 207, MGT 301, MKT 301, PED 410, or PSY 103.

Students selecting specialization in corrective and adapted physical education must take PED 410, 430, one course from EDC 402, PED 275, RCR 416, one course from NUR 101, PED 391, PSY 442, and six or seven additional credits of appropriate electives, in consultation with their academic advisor.

Students who do not specialize in any of the above areas may complete a minimum of 18 credits in an individual, college, or University minor. See page 29 for a complete definition of a minor.

Plan for Early Contingent Admission to the Master of Science (M.S.) Degree Program in Physical Therapy. In addition to the Teacher and Non-Teacher Certification Options, there is a plan for early admission to the M.S. degree program in physical therapy contingent upon completion of a curriculum similar to the nonteacher option. The plan incorporates physical therapy master's degree prerequisites in chemistry, physics, psychology, mathematics, and field experience, as well as fulfillment of physical education bachelor's degree requirements. Application to the graduate 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 18 credits of coursework in physical therapy applied to the B.S. degree in physical education. A 3.00 average in physical therapy coursework is required to attain full graduate status and continue in the physical therapy program.

The following courses are required for physical education majors accepted for early contigent admission into the M.S. degree program in physical therapy: PHT 410, 412, 417, 418, 420, and 422. These courses can be taken only in the senior year by students who have earned contingent admission the M.S. degree program in physical therapy. In addition, all students enrolled in the physical therapy program will take PHT 430, 510, and 532 in the second semester of their fourth undergraduate year, as part of the graduate degree requirements. Students awaiting notification of acceptance should register for an alternate nonteacher option in physical education.

A total of 130 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 *Graduate School Bulletin*.

The major is open to both men and women with ability and professional interest in the artistic and technical aspects of the subject.

Programs of study can be arranged to prepare students for positions in merchandising of apparel and interior furnishings, the home sewing industry, museum work, consumer services, and manufacturing. Qualified students can prepare for graduate studies.

The following courses are required: TMD 103, 224, 216 or 222, 303[3], 313, 240 or 340, or 440, 433[4], and CNS 220, ECN 125, 126, 12 credits of TMD electives (6 credits must be upper-level courses); in addition, 18 credits with at least 9 credits in any one area must be selected in relation to specified professional options listed below. Students must have completed CHM 103, 105, 124, and 126 before admission into the degree-granting college.

Fashion Merchandising. Students choosing this area of emphasis should select 12 credits of TMD electives from TMD 232, 317, 332, 422, 432, and an additional 18 credits of professional electives[5] from marketing, accounting, business law, management science, management, and/or art.

General TCRA Program. Students selecting this area of emphasis should plan according to their professional goals such as consumer education, gerontology, family studies, journalism, or art. Eighteen credits of professional electives are required and should be chosen to strengthen professional goals of students.

Textile Science. Students may select a concentrated science program at The University of Rhode Island or plan to spend two semesters in off-campus study to fulfill the specialized requirements in textile dyeing, finishing, and manufacturing. By the end of the sophomore year,

[3]Organic chemistry is a prerequisite for TMD 303.

[4]Economics prerequisite for CNS 220 and TMD 433.

[5]Professional electives are courses related to student's career goals and subject to advisor's approval.

the student and advisor should have a program of study approved by the department. Off-campus study is currently available at the Philadelphia College of Textiles and Science (P.C.T.S.).

Students interested in this area of emphasis should select 18 credits of professional electives from 3-9 credits in MTH 111, 141, 142; 3-6 credits in PHY 111 and 112 or 213 and 214; 3-6 credits in EST 408 or 412 or CSC 201 or 202; CHM 112 or 114 or 227 or 228 or 226 or 212 or from the courses offered by P.C.T.S.

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 accreditation 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, 126, MTH 111, 141, EST 408, 412, and CSC 201.

Due to limited staff and facilities, transfers from University College to the undergraduate degree program in textile marketing must be limited to only a few 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 2.40 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 440, 403, 433, and three credits of TMD elective; CHM 105, 126; MTH 141; EST 408, 412; CSC 201; ACC 201 and 202; MGT 300 or 301; BSL 333; MKT 301, 415, 409, 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 125, 126.

A total of 120 credits is required for graduation.

College of Nursing

Jean Miller, *Dean*
Dayle H. Joseph, *Assistant Dean*

The College of Nursing offers a curriculum leading to the Bachelor of Science (B.S.) degree. The Master of Science (M.S.) and the Doctor of Philosophy (Ph.D.) degrees are offered by the college and are described in the *Graduate School Bulletin*.

Faculty: Professors Hardy, Hirsch, and Kim; Associate Professors Castro, Feather, Fortin, Garey, McElravy, and Schwartz-Barcott; Assistant Professors Abbate, Anderson, Barden, Barnett, Burbank, Evans, Fimbel-Coppa, Haggerty, Hall, Hames, Hogan, Martins, McGrath, Mitchell, Murdock, Padula, Palm, Pickett, Rozendal, Waldman, and Yeaw; Instructors Burchard, Escher-Davis, Mattea, and Wilson.

The baccalaureate program is designed to prepare men and women with academic and personal potential to become professional nurses. It aims to develop mature, well-informed graduates who will take their places as responsible members of society in meeting the challenges of health care delivery and of continued learning.

The curriculum is based on the belief that nursing is a creative activity which provides human services for the promotion of health, prevention of illness, and care for 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, adaptation-level theory, and nursing process. Nursing courses include observation and clinical practice in numerous hospitals, community agencies, schools, nursing homes, and physicians' offices throughout the state of Rhode Island.

There are three routes to admission to the College of Nursing baccalaureate program.

1) Students with no previous college of nursing study begin their preparation in University College with dual enrollment in the College of Nursing. After completion of 37-50 credits (which must include required foundation courses) with a minimum 2.20 quality point average, they may apply for confirmed admission 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.

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 Examina-

tions sponsored by the College Entrance Examination Board. Advanced credit allowances are based upon a review of the candidate's test scores and preparatory experience. Following direct admission to the college, students have the option of seeking credit by proficiency examination in subjects previously studied. They are required to enroll in some upper division nursing courses and to meet the remaining program specifications.

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 of the General Education requirements of the University as listed on page 9. A minimal grade of C must be achieved in all required nursing courses. 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 for participation in the Honors Program.

General expenses for students in the College of Nursing are approximately the same as for all 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 during the semester of community health nursing experience, and can offer broader opportunities for experience in all courses.

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.

Curriculum Requirements

Foundation Courses. The following are required before transfer from University College: CHM 103 (3 credits), CHM 124 (3), EST 220 (3), NUR 100 (3), PHL 101 (3), PSY 113 (3), ZOO 121 (4), ZOO 242 (3), ZOO 244 (1), one writing (Cw) course (3).

The following are required before beginning the clinical nursing courses and therefore are recommended during the first two years: FSN 207 (3 credits), MIC 201 (4), SOC 100 (3), PCL 225 (2), PCL 226 (2), NUR 200 (3).

An example of the curriculum plan follows.

Freshman Year
First semester: 13 credits

4 ZOO 121 Human Anatomy
3 PHL 101 Logic
3 PSY 113 Gen. Psychology
3 CHM 103 Gen. Chemistry

Freshman Year
Second semester: 16 credits

3 ZOO 242 Human Physiology
1 ZOO 244 Human Physiology Lab.
3 CHM 124 Organic Chemistry
3 EST 220 Statistics in Mod. Society
3 NUR 100 Health, Illness, and the Ecosystem
3 WRT 101 Composition

Sophomore Year
First Semester: 18 credits

3 FSN 207 Gen. Nutrition
4 MIC 201 Int. Medical Microbiology
3 SOC 100 Gen. Sociology
2 PCL 225 Pharm. & Therapeutics I
3 PSY 232 Developmental Psychology
3 NUR 200 Scientific Inquiry in Nursing Practice

Sophomore Year
Second Semester: 17 credits

2 PCL 226 Pharm. & Therapeutics II
3 NUR 210 Introd. to Medical Care I
3 NUR 230 Methods in Nursing I
3 NUR 250 Nursing in Health Promotion
3 NUR 235 Practicum in Gen. Nursing Strategies
3 SOC 212 The Family

Junior Year
First Semester: 15 credits

3 NUR 212 Introd. to Medical Care II
3 NUR 240 Methods in Nursing II
3 NUR 260 Nursing in Short-Term Health Care
3 NUR 255 Practicum in Health Promotion Nursing
3 NUR 265 Practicum in Short-Term Nursing of Adults

Junior Year
Second Semester: 15 credits

3 NUR 310 Family Health Nursing
3 NUR 315 Practicum in Family Health Nursing
3 NUR 305 Practicum in Nursing of Children
3 EDC 312 The Psychology of Learning
3 Gen. educ. elective (F)

Senior Year
First Semester: 18 credits

3 NUR 320 Nursing in Long-Term Health Care
3 NUR 325 Practicum in Long-Term Nursing of Adults
3 NUR 326 Practicum in Mental Health and Psychiatric Nursing
3 Gen. educ. elective (F or L)
3 Gen. educ. elective (A)
3 Free elective

Senior Year
Second Semester: 18 credits

3 NUR 300 Professional Nursing Practice and Role Development
3 NUR 330 Community Health Nursing
3 NUR 335 Practicum in Community Health Nursing
3 Gen. educ. elective (L)
3 Gen. educ. elective (A)
3 Free elective

Required Courses for the Nursing Major. The following are required for the nursing major: NUR 210 (3), 212 (3), 230 (3), 235 (3), 240 (3), 250 (3), 255 (3), 260 (3), 265 (3), 300 (3), 305 (3), 310 (3), 315 (3), 320 (3), 325 (3), 326 (3), 330 (3), and 335 (3). Other nonnursing required courses include: PSY 232 (3), SOC 212 (3) or HCF 330 (3), and EDC 312 (3), or equivalents.

General Education and Free Electives. The General Education electives as required for all University undergraduates must be completed except that one of the following divisions may be reduced by 3 credits: fine arts and literature, letters, or foreign language and culture.

A total of 130 credits is required.

College of Pharmacy

Louis A. Luzzi, *Dean*
Leonard R. Worthen, *Associate Dean*
Lois Vars, *Assistant Dean*

The College of Pharmacy offers a five-year curriculum leading to the Bachelor of Science (B.S.) degree in pharmacy and a special curriculum leading to the Bachelor of Science (B.S.) degree in respiratory (ventilation) therapy. The Master of Science (M.S.) degree, offered by all departments; the Doctor of Pharmacy (Pharm. D.) degree; the Doctor of Philosophy (Ph.D.) degree in pharmaceutical sciences offered by all departments except pharmacy administration, and the Master of Science (M.S.) degree in environmental health science are described in the *Graduate School Bulletin.*

Pharmacy

This five-year curriculum is 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. It is accredited by the American Council on Pharmaceutical Education and by the University of the State of New York, Division of Professional Education.

It 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.

The satisfactory completion of the degree in pharmacy is one of the prerequisites for a license to practice pharmacy. Licensure is obtained after graduation by successfully completing the examination given by the Rhode Island State Board of Pharmacy or those of other states.

Students begin their preparation in University College with a dual enrollment in the College of Pharmacy. All students requesting transfer from University College to the College of Pharmacy must have at least a 2.00 overall quality point average in those basic science courses required for transfer; viz., at the end of three semesters CHM 101, 102, 112, 114, and 227; MIC 201; MTH 141; PHY 109, 110; ZOO 111 and 121; at the end of four semesters the foregoing courses plus CHM 226 and 228; ZOO 242 and 244 (or equivalent courses, where permitted).

A student will not be allowed to proceed into PHP 483, 484, or 490 without at least a 1.90 quality point average in required professional pharmacy courses. A student with a QPA of 1.90 to 2.00 may proceed into PHP 483, 484, and 490 and other fifth-year courses on college probation. A student with less than a 1.90 QPA in professional courses at the end of the fourth year will not be allowed to take any professional courses not previously taken, but will be allowed to repeat up to 10 credits of pharmacy courses in which he or she received a C or less.

A quality point average of 2.00 in all required professional courses given by the College of Pharmacy is required for graduation with a B.S. degree in pharmacy. This is in addition to University grade requirements.

Students in certain other New England states may enroll in pharmacy under the New England Regional Student Program. See page 18.

Medicinal Chemistry Faculty: Professor Abushanab, *chairperson.* Professors Panzica, Smith, and Turcotte; Emeritus Professor Bond; Adjunct Professor Tyson; Adjunct Associate Professor DiSpigno.

Pharmaceutics Faculty: Professor Rhodes, *chairperson.* Professors Lausier and Paruta; Assistant Professor Rosenbaum; Adjunct Professors Carlin, Kanig, and Marshall; Adjunct Assistant Professor Horhota; Adjunct Instructors Loftus and Soja.

Pharmacognosy and Environmental Health Faculty: Professor Shimizu, *chairperson.* Professor Worthen; Assistant Professors Okuda and Chen; Emeritus Professor Youngken; Adjunct Professors Nakanishi and Siino; Adjunct Assistant Professsor Omar.

Pharmacology and Toxicology Faculty: Professor Shaikh, *chairperson.* Professors DeFanti and Swonger; Associate Professors Chichester and Rodgers; Adjunct Professors Lal and Turner; Adjunct Associate Professors Fielding, Giambalvo, Kaplan, Levinsky, and Lundgren; Adjunct Assistant Professors Fisher, Jackim, and Malcolm; Clinical Professor Calabresi.

Pharmacy Practice Faculty: Professor Taubman, *chairperson.* Professor Campbell; Associate Professors Mattea and Weber; Assistant Professors Dudley, Hume, McCloskey, McFarland, Owens, and Sherburne; Adjunct Professors Ford, Carlin, and Leco; Adjunct Assistant Professors DiBenedetto, Hachadorian, and Holm; Adjunct Instructors Auger, Bulger, Gibson, Grant, Lombardi, Menard, and Roy.

Curriculum Requirements

The five-year program for all accredited colleges of pharmacy provides time for the General Education requirements as described on page 9. 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 clinical studies and internship requirements.

Total credits required: 167.

First Year
First semester: 17 credits

3 CHM 101 Gen. Chemistry I
1 CHM 102 Lab. for Chemistry 101
3 PSY 113 Gen. Psychology **or** elective
3 A University-approved English communications course except BGS 100 and MGT 227[1]
4 ZOO 111 Gen. Zoology
3 Elective

First Year
Second semester: 17 credits

3 CHM 112 Gen. Chemistry II
1 CHM 114 Lab. for Chemistry 112
3 MTH 141 Introd. Calculus
3 A University-approved English communications course except BGS 100 and MGT 227[1]
4 ZOO 121 Human Anatomy
3 Elective

Second Year
First semester: 17 credits

3 CHM 227 Organic Chemistry Lecture
3 ECN 125 Econ. Principles
4 MIC 201 Introd. Med. Microbiology
3 PHY 109 Introd. to Physics
1 PHY 110 Lab. for Introd. to Physics
3 Elective

Second Year
Second semester: 17 credits

3 CHM 228 Organic Chemistry Lect. II
2 CHM 226 Organic Chemistry Lab.
2 HLT 272 Adv. First Aid
3 ZOO 242 Introd. Human Physiology
1 ZOO 244 Introd. Human Physiology Lab.
6 Electives

Third Year
First semester: 18 or 17 credits

3 ASP 401 Introd. to Pathology
3 BCP 311 Introd. Biochemistry
3 PHP 349 Pharm. Adm. Principles
2 PHC 327 Biopharmaceutics

and
Section A

5 PHC 330 Gen. Pharm. Technology
2 PHC 331 Lab. for Gen. Pharm. Technology

or
Section B

3 MCH 342 Pharmaceutical Analysis
3 Elective

Third Year
Second semester: 19 credits

3 MCH/PCL 344 Principles of Medicinal Chem. and Pharmacology
3 PHP 351 Pharm. Law and Ethics
3 PCG 446 Gen. Pharmacognosy Lecture
3 PHC 328 Pharmacokinetics

and
Section A

3 MCH 342 Phamaceutical Analysis
1 PCG 447 Gen. Pharmacognosy Lab.
3 Elective

or
Section B

5 PHC 330 Gen. Pharm. Technology
2 PHC 331 Gen. Pharm. Technology Lab.

Fourth Year
First semester: 17 credits

3 MCH 443 Organic Medic. Chemistry
3 PCG 445 Gen. Pharmacognosy
3 PCG 459 Public Health
4 PCL 441 Gen. Pharmacology
3 PHP 451 Pharmacotherapeutics I

and
Section A

1 PCL 443 Gen. Pharmacology Lab.

or
Section B

1 PCG 447 Gen. Pharmacognosy Lab.

Fourth Year
Second semester: 16 credits

3 MCH 444 Organic Medic. Chemistry
4 PCL 442 Gen. Pharmacology
3 PHP 452 Pharmacotherapeutics II

and
Section A

6 Electives

or
Section B

1 PCL 443 Gen. Pharmacology Lab.
4 PHC 460 Nonprescription Drugs
1 PHP 470 Pharmacy Practice

Fifth Year
First semester: 14 or 15 credits

Section A

4 PHC 460 Nonprescription Drugs
1 PHP 470 Pharmacy Practice
9 Electives

or
Section B

5 PHP 483 Community Pharmacy Externship
5 PHP 484 Pharmacy Hospital Externship
5 PHP 490 Clinical Pharmacy Clerkship

Fifth Year
Second semester: 15 credits

Section A

5 PHP 483 Community Pharmacy Externship
5 PHP 484 Hospital Pharmacy Externship
5 PHP 490 Clinical Pharmacy Clerkship

or
Section B

15 Electives

Respiratory Therapy

The program in respiratory therapy prepares students for an allied health specialty related to the management of respiratory disease. The respiratory therapist works with the physician, pharmacist, nurse, and other specialists in a hospital or institutional environment where multiple responsibilities are necessary in the care of patients.

Curriculum Requirements

To qualify for the Bachelor of Science program in respiratory therapy, students must complete a two-year program in respiratory therapy including clinical work. This may be carried out at the Community College of Rhode Island or an equivalent community college with a clinical program in respiratory therapy leading to an associate's degree.

The student program at The University of Rhode Island includes one of two majors — education or administration/supervision.

A total of 65 University of Rhode Island credits are required.

The following curriculum is subject to change.

[1]CMS 101 (6 credits) may be substituted for the writing requirement.

Junior Year[2]
First semester: 16 credits

4 CHM 124 Organic Chemistry
3 MTH 141 Introd. Calculus with Analytic Geometry
3 SOC 100 Gen. Sociology
3 EDC 312 The Psychology of Learning
3 Elective[3]

Junior Year
Second semester: 16 credits

3 ASP 401 Introd. to Pathology
3 MGT 300 Personnel Administration or MGT 301 Fundamentals of Management[4]
3 CSC 201 Computer Science
4 PHY 112 Gen. Physics
3 Elective

Senior Year
First semester: 18 credits

3 BCP 311 Introd. Biochemistry
3 ELE 300 Elec. Instrum. for Biology and Health Sciences
3 EDC 340 Methods and Materials in Secondary Teaching
3 SOC 224 Medical Sociology
3 RTH 499 Special Problems in Respiratory Therapy
3 Elective

Senior Year
Second semester: 15 credits

3 PCL 226 Pharmacology and Therapeutics
3 RTH 499 Special Problems in Respiratory Therapy
3 Elective
3 Elective
3 Elective

[2]Summer session programs may be needed to fulfill all curriculum requirements.

[3]Additional prerequisites may be required for certain elective areas of the major.

[4]MGT 301 required for students with an administrative/supervision core.

College of Resource Development

Gerald A. Donovan, *Dean*
Earl F. Patric, *Associate Dean*
Ida D. Dunbar, *Assistant Dean*

The College of Resource Development offers undergraduate programs leading to the Bachelor of Landscape Architecture (B.L.A.) degree and the Bachelor of Science (B.S.) degree in animal science and technology, aquaculture and fishery technology, food science and nutrition, natural resources, plant science and technology, and urban affairs. A number of *options* have been developed within most programs to permit students to prepare for specific graduate study, further professional training, or for specialized careers at the B.S. level. Entering freshmen and transfer students with fewer than 24 credits should matriculate in one of these programs as well as in University College. Students may select one of the options at the time of transfer from University College or later, with approval dependent upon favorable review by the program faculty. All undergraduate programs are administered by the Associate Dean for Programs together with the academic advisors and the program faculties.

The Resource Development faculty differs from those in the other colleges in that most hold joint appointments with the Rhode Island Agricultural Experiment Station and/or the Rhode Island Cooperative Extension Service. These units represent the formal research and public service functions of the college and are funded with federal and state monies. In addition, some faculty members have formal commitments to the International Center for Marine Resource Development and the Sea Grant program.

Graduate programs leading to the Master of Science (M.S.) degree are offered in most departments. Several programs lead to the Doctor of Philosophy (Ph.D.) degree. The professional degree of Master of Community Planning (M.C.P.) is offered by the Department of Community Planning and Area Development. Detailed descriptions of the several graduate programs appear in the *Graduate School Bulletin*.

Faculty

Community Planning and Area Development Faculty: Associate Professor Foster, *director*. Professor Feld; Associate Professor Kupa; Assistant Professors Atash, Feldman, and Jensen; Adjunct Professor Thomas; Adjunct Associate Professors Kumekawa, Shaw, and Veri; Adjunct Assistant Professors Manheim, Schatz, and Winsor.

Fisheries, Animal and Veterinary Science Faculty: Professor Meade, *chairperson*. Professors Chang, Donovan, Durfee, and Wolke; Associate Professors Gray, Millar, Nippo, Recksiek, Rhodes, and Wing (equiv.); Assistant Professors Bradley, DeAlteris, Rice, and Stout; Adjunct Professors Kaiser and Walsh; Adjunct Associate Professors Fleming and Gentile; Adjunct Assistant Professors Balmforth, Blott, and Ganz.

Food Science and Nutrition Faculty: Professor Rand, chairperson. Professors Constantinides, Cosgrove, Dymsza, C. Lee, T.-C. Lee, Simpson, and Traxler; Asso-

ciate Professors Caldwell and Eshleman; Assistant Professors English, Gerber, and Morrissey; Adjunct Professors Silverman and Taylor; Adjunct Assistant Professors Howe, Lee, and Maugle.

Landscape Architecture Faculty: Associate Professor Hanson, *coordinator.* Associate Professor Dunnington; Assistant Professor Simeoni.

Natural Resources Science Faculty: Professor Wright, *chairperson.* Professors Brown, Felbeck and Patric; Associate Professors Gold, Golet, Husband, and McKiel; Assistant Professor Groffman; Assistant Research Professor August; Adjunct Associate Professor Olsen; Adjunct Assistant Professor Davis.

Plant Sciences Faculty: Professor Hull *chairperson.* Professors Jackson, McGuire, Mueller, and Skogley; Associate Professors Casagrande, Duff, Dunnington, Englander, Gough, Hanson, Krul, LeBrun, Logan, Shaw, and Sullivan; Assistant Professors Alm, Chandlee, and Simeoni; Adjunct Professor Kaplan; Adjunct Assistant Professors Bascom and Dellaporta.

Resource Development Education Faculty: Assistant Professor Patnoad, *chairperson.* Professor McCreight; Associate Professor Feeney; Assistant Professors Bancroft, Mallilo, and Morreira.

Resource Economics Faculty: Associate Professor Weaver, *chairperson.* Professors Gates, Grigalunas, Holmsen, and Sutinen; Associate Professors Opaluch and Tyrrell; Assistant Professors J. Anderson, Swallow, and Wichelns; Adjunct Assistant Professor Andersen.

Bachelor of Landscape Architecture Curriculum Requirements

Landscape Architecture is a curriculum leading to the Bachelor of Landscape Architecture (B.L.A.) degree. The landscape architecture curriculum educates and prepares undergraduate students for professional careers in the public and private sectors of landscape architecture which 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 are used to undertake natural, historic, and coastal landscape preservation projects.

The requirements of the curriculum include preparation in the basic arts as well as the basic sciences. The professional core includes 9-12 credits of introductory professional courses, 31 credits of concentration courses, and 26-32 credits of supporting electives through which a student may attain additional preparation in the plant sciences, or in art and community planning.

Bachelor of Science Curriculum Requirements

All B.S. programs offered in the college require a minimum of 130 credits in three categories: general education (36 credits), free electives (12 credits), and program (82 credits).

The *General Education* requirements provide exposure to English communications, mathematics, natural sciences, social sciences, letters, fine arts/literature, and foreign language/culture as directed by the University faculty, and must be selected from the approved lists of courses for the several categories.

A block of *free elective* courses is available in each program to give students the opportunity to explore areas of knowledge that may be unrelated to their principal program.

The *program* requirements include introductory professional courses, basic sciences, concentration courses, and supporting electives. Advisory materials for each program include a list of these courses. These are available upon request from the Office of Student Affairs. Students, working closely with their faculty advisors, may shape their programs to accommodate general or specific needs and interests not represented by one of the options.

Students pursuing an *option* will encounter much more structure, particularly in the basic sciences and in the concentration requirements. The structure reflects specific admission requirements to graduate or professional programs on the one hand, and the professional requirements of an accrediting agency on the other. The additional requirements for the options are also available on request from the Office of Student Affairs.

Animal Science and Technology

This program is for students interested in applied animal science careers. Options are available to students interested in veterinary medicine, animal sciences, and in various phases of the equine or laboratory animal industries. Those students who intend to use their study in animal science as credentials for secondary school teaching should also enroll in this program.

The program requires a minimum of 7 credits in introductory animal science and genetics; 8 credits in zoology and botany; 8 credits in inorganic chemistry; and 3 credits in algebra/trigonometry. In addition, 9-12 credits shall be selected in basic science, 24 credits of concentration courses, and 26-29 credits of supporting electives approved for the program.

Animal Management Option. This option provides a broad basis in animal science. A variety of scientific disciplines, together with their practical application to animal management is available. Students usually seek employment in animal agriculture or agri-industry related positions.

In addition to the requirements of the program, option students include 6 credits of animal management in the concentration. The remaining credit requirements in the basic sciences, concentration, and supporting electives must be selected from courses approved for this option.

Animal Science Option. This option includes animal nutrition, physiology, genetics, and diseases. 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 program, option students must complete the following basic science requirements: organic chemistry (4 or 8), introductory calculus (3), microbiology (4). A course in animal anatomy and physiology is required in the concentration. The remaining credit requirements shall 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 attendants, and assistant research project leaders.

In addition to the requirements of the program, option students must complete the following basic science requirements: organic chemistry (4 or 8), introductory calculus (3), microbiology (4), and statistical methods (3). Six credits in animal management and three in animal anatomy and physiology are required in the concentration, and three credits of general nutrition in the introductory college courses. The remaining credit requirements shall 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 science. 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 program, option students must complete the following basic science requirements: two-semester sequence in organic chemistry (8), biochemistry (3), microbiology (4), general physics (8), introductory calculus (3), and intermediate calculus or statistical methods in research (3). Three credits in animal anatomy and physiology are required in the concentration. The remaining credits shall be selected from the concentration courses and supporting electives approved for this option.

Aquaculture and Fishery Technology

This program prepares students for professional or technical careers in aquaculture or fisheries-oriented occupations. This program 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 program requires a minimum of 9 credits of introductory professional courses including natural resource conservation, fisheries or aquaculture, and resource economics; 6–8 credits of animal and plant biology; 4 credits of general chemistry; 4 additional credits of general or organic chemistry; and 9-12 additional credits of basic science from the approved course list in the Departments of Botany, Chemistry, Computer Science, Statistics, Mathematics, Physics, and Zoology. In addition, the program requires 24 credits of concentration courses at the 300 level or above; 18 credits of the concentration courses must be in fisheries and aquaculture from the Department of Fisheries, Animal and Veterinary Science (FMT and ASP); the remaining 6 credits of concentration courses may be taken from the approved list of concentration courses in the Departments of Fisheries, Animal and Veterinary Scinece, Food Science and Nutrition, Marine Affairs, Oceanography, Resource Economics, and Zoology. Finally, the program requires 30-36 credits from the approved list of supporting elective courses in the Departments of Fisheries, Animal and Veterinary Science, Botany, Food Science and Nutrition, Marine Affairs, Natural Resources Science, Oceanography, Resource Mechanics, Resource Economics, and Zoology.

Food Science and Nutrition

This program prepares for professional or technical careers in biotechnology, food science, nutrition, and dietetics. Students who demonstrate ability in the basic sciences and have professional interest in food science and technology, biotechnology, or nutrition, should choose those options. Those aspiring toward employment as dietitians should select the dietetics option.

The program requires a minimum of 6 credits in general nutrition and food science; 6-8 credits in animal and plant biology; 4 credits in general chemistry; 4 credits in the second general chemistry or organic chemistry; and 3 credits in algebra/trigonometry. Biology and chemistry courses should be selected from the requirements of the chosen option. In addition, 9-12 credits in the basic sciences, 24 credits of concentration courses, and 30-35 credits of supporting electives should be selected from courses approved for this program.

Biotechnology Option. Biotechnology is the integration of basic and applied science for the modification of life forms, development of new biological systems, and conversion and processing of materials of a biological nature. It is a multidisciplinary field which deals with the use of microorganisms, plants, or their component parts. Biotechnology encompasses all of the food industry as well as the fermentation and biochemical industries, antibiotic and enzyme production, and the biological treatment of water and effluents.

In addition to the requirements of the program, students in this option must complete the following basic science requirements: organic chemistry (8), biochemistry (3), microbiology (4), plant physiology (3), introductory calculus (3), and introductory physics (4). The concentration includes courses in applied biochemistry (food biochemistry), cell biology, applied biology (plant cell and tissue culture), biochemical processes (food processing), industrial microbiology, quality control (food microbiology, food analysis), and process engineering (food engineering). The supporting electives include a course in statistical methods in research, the plant tissue culture laboratory, and a course in bioprocessing, with the remainder selected from courses approved for this option.

Dietetics Option. Dietetics is the professional study of human nutrition to help people select nutritionally adequate diets throughout their life span. Careers include those related to food service systems and to nutritional care of individuals and groups. The option incorporates all of the minimum academic requirements of the American Dietetic Association. Graduates are eligible to apply for dietetic internships.

In addition to the requirements of the program, option students must complete the following basic science requirements: organic chemistry (4), biochemistry (3), microbiology (4), and human physiology

(3). Concentration requirements include advanced food study (3), quantity food production (3), quantity food purchasing (3), food service management (3), advanced nutrition (3), nutrition and disease (3), educational methods and materials (3), psychology of learning (3), and introduction to management (3). The supporting electives require the introductory course in food study, with the remainder selected from courses approved for this option.

Food Science and Technology Option. Food science is the application of science and technology to the processing, preservation, and distribution of food with special emphasis on seafood. 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, developing new food products in order to feed the rapidly increasing world population, and improving the nutritional level of diets throughout the world. The option is officially recognized by the Institute of Food Technologists.

In addition to the requirements of the program, option students must complete the following basic science requirements: organic chemistry (8) or organic chemistry (3) and biochemistry (3); introductory calculus (3); microbiology (4); and general physics (4). The concentration courses include marine food processing (4), food analysis (4), food biochemistry (3), food processing (3), food chemistry lab (3), food engineering (4), and food microbiology (3). The supporting electives include courses in statistical methods in research and food safety and sensory evaluation, with the remainder selected from the list of courses approved for this option.

Food Service Management and Food Marketing Option. This is a joint program offered by the Departments of Food Science and Nutrition and Resource Economics. Students learn aspects of food marketing, food distribution, and food service management. It is a multidisciplinary field which combines the study of food and resource economics, marketing, and management, with application in food industries. Courses in food science, food study, chemistry, and microbiology provide an understanding of food properties. A foundation in economics is developed from courses in resource economics, marketing, and management.

In addition to the requirements of the program, students in the option must complete the following basic science requirements: microbiology (3) and statistics or computer science (3). Required courses include introductory food study (3), nutrition (3), and resource economics (3). Concentration courses of 24 credits are selected from advanced food study, quantity food production, quantity food purchasing and cost control, food service management, food sanitation, management, food marketing, and economics. Supporting electives are designed to strengthen the students' expertise in their particular area of interest within the program. Individually designed special projects and, in some cases, internships are available from both departments to allow students to gain experience and expertise in the field.

Nutritional Science Option. 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.

In addition to the requirements of the program, option students must complete the following basic science requirements: biochemistry (3), human physiology (3), and statistical methods (3). Concentration requirements include advanced nutrition (3) and nutrition and disease (3), with the remainder selected from the approved option courses. The supporting electives include the introduction to food study (3) and must be selected from the courses approved for this option.

Natural Resources

This program gives students solid academic training in all the major areas of natural resources science and management. It is designed for those students who have a strong interest in the natural world and who are committed to the maintenance of environmental quality and the wise use of our natural resources. Options in Forest Science, Wildlife Biology and Management, Soil Science, Water Resources, and Resource Economics provide in-depth training in specific, career-related disciplines. Students who wish to obtain a broader background enroll in the Natural Resources Studies Option.

All six options require coursework in basic sicences and professional courses. The requirements vary between options, but usually include natural resource conservation, resource economics, biological, physical, and chemical sciences, as well as mathematics and computer science.

Forest Science. This option introduces students to the field of forestry and prepares them for further study at accredited forestry schools and at the graduate level. While this is not designed to prepare students for professional work in forestry immediately after graduation, a limited number of such opportunities do exist.

As part of their basic science requirements, students in this option must complete 3 credits of coursework in introductory calculus, an additional 3 credits in mathematics or computer science, 3 credits in introductory ecology, and 3–4 credits in basic geology. The second semester of chemistry must be organic. Courses required for concentration and supporting elective credit include: forestry (6), wildlife management (3), field botany (3), soil genesis and classification (4), statistics (3), surveying (3), and plant diseases or entomology (6). Additional courses are selected in consultation with a faculty advisor.

Natural Resources Studies. This option was designed for those students who wish to obtain a broader background than is possible in any of the specialized options listed above. Flexible curriculum requirements allow these students to develop individual areas of concentration, and to maximize the variety of natural resources positions for which they might be qualified upon graduation. This option is the best choice for students who plan to become certified as teachers of natural resources at the secondary level. It also provides a solid foundation for graduate study in several natural resources disciplines.

As part of their basic science requirements, Natural Resources Studies students must complete one course in introductory ecology (3) and one in basic geology (3). For the concentration area, 15 credits must be selected from upper-level offerings in the Department of Natural Resources Science. Additional concentration courses and supporting electives are chosen in consultation with a faculty advisor.

Resource Economics. This option offers an analysis of contemporary problems and issues facing food and natural resource industries, policymakers, and consumers. It provides students with a

background in applied economics of food and natural resource industries, environmental management, and food and natural resource policy. Students receive solid preparation for professional and graduate programs in law, agricultural and resource economics, regional planning, and business administration. The program also prepares students to pursue careers in the domestic and international food supply and marketing industries, the banking industry, commercial fisheries management, and in federal, state, and local government agencies concerned with regulating fisheries, marine and water pollution, food industries, land use, and offshore oil.

Under the basic sciences, Resource Economics students must complete one course in computer science (3) and introductory ecology (3). Three credits in intermediate microeconomic theory are required in the concentration. The remaining concentration courses and supporting electives are selected in consultation with a faculty advisor.

Soil Science. This option is concerned with the soil system as a natural body; it deals with the physical, chemical, and biological properties of soils, and their relationship to higher plants. Students in this option will have the background in soils and the basic sciences needed for national certification as a soil scientist and for graduate study.

Under the basic sciences, Soil Science students are required to take organic chemistry (3–4), quantitative analysis (4), physical geology (4), microbiology (4), introductory calculus (3), and physics (4–8). In the concentration, 9–12 credits shall be selected from courses in soil chemistry, soil biochemistry, soil genesis and classification, soil microbiology, and geomorphology. The remaining concentration courses and supporting electives are selected in consultation with a faculty advisor.

Water Resources. This option is designed for students with an interest in the management of water and related land resources. It is an appropriate choice for those who plan to pursue careers in wetland ecology, forest hydrology, water resources planning, agricultural water management, or water pollution abatement. The option also provides sound preparation for graduate study in water resources management.

As part of their basic science requirements, Water Resources students must take introductory ecology (3), basic geology (3–4), computer science (3), introductory calculus (3), and 6 additional credits from chemistry or economics, depending upon the student's career objectives. Courses in wetland ecology (4), water resources management (3), and limnology (4) are required for concentration credit. Additional concentration and supporting elective courses are selected from a broad array of disciplines, including: soil science, wildlife management, forestry, geology, botany, zoology, resource economics, environmental law land use planning, fisheries, civil engineering, and marine affairs.

Wildlife Biology and Management. This option prepares students to meet the educational requirements for state and federal employment in the wildlife profession, and for certification under the Wildlife Society's national program. It also provides an excellent background for graduate study in wildlife management.

As part of their basic science requirements, wildlife students must complete 3 credits of coursework in introductory calculus, an additional 3 credits in mathematics or computer science, 3 credits in introductory ecology, and 3-4 credits in basic geology. The second semester of chemistry must be organic. Required concentration courses include: wildlife management (9); vertebrate biology (3); animal physiology (3); forestry (3); field botany (3); and one additional course in forestry or aquaculture (3). Supporting electives include: botany (3), zoology (6), and statistics (3). Additional supporting electives are chosen in consultation with a faculty advisor.

Plant Science and Technology

This program provides a strong background in the plant and related sciences. Students may prepare for careers in the more practical or technical aspects, or choose the basic and applied sciences needed for graduate study. Students interested in forage and food crops, and those planning to include teacher training should enroll in this program.

The program requires a minimum of 14 credits in introductory plant science, soils, plant protection, and general genetics; 8 credits in botany and zoology; 8 credits in general chemistry; and 3 credits in mathematics. An additional 9–12 credits, including a course in plant physiology must be selected in basic sciences; 24 credits of concentration courses, and 22–25 credits of supporting electives from courses approved for the program.

Food Crop Management Option. This option offers students a broad background in the basic and applied plant sciences. Students can develop specialization in the scientific principles of growing important agricultural food crops such as fruits and vegetables as well as field and forage crops. Specialization is also offered in resource mechanics. Career opportunities range from farming to working for agricultural seed, fertilizer, and chemical companies as well as positions in the state and federal government in advisory, service, regulatory, and management positions.

In addition to the requirements of the program, option students must complete the following basic science requirements: organic chemistry (4) and plant physiology (3). The remaining credits in concentration and supporting electives must be chosen from courses approved for this option.

Ornamental Horticulture Option. This option prepares students for technical positions in ornamental horticulture and floriculture, and for graduate study, teaching, or cooperative extension careers in this field.

In addition to the requirements of the program, option students must complete the following basic science requirements: plant physiology (3), organic chemistry (4), general physics (4–8). The remaining credits in concentration and directed electives must be chosen from courses approved for this option.

Plant Protection Option. This option offers a strong integrated background in the basic and applied aspects of plant health, and includes studies of the biological agents that affect the ecological and economic well-being of plants. It may lead to a terminal degree or be a preparation for graduate study in plant protection, plant pathology, entomology, weed science, and other disciplines in plant science.

In addition to the requirements of the program, option students must complete the following basic science requirements: plant physiology (3), plant anatomy (3), field botany, organic chemistry (8), microbiology (4) and statistical methods (3). The remaining concentration courses and

supporting electives shall be selected from courses approved for this option.

Turfgrass and Grounds Management Option. This option is designed to prepare students for professional careers in this field. Graduates may be employed in sod production, in landscape construction, or as superintendents of golf courses, cemeteries, parks, or industrial, public, or military grounds. They are also employed in sales positions within supporting industries.

In addition to the requirements of the program, option students must complete the following basic science requirements: organic chemistry (4) and plant physiology (3). Concentration course requirements include 6 credits in turf management, 6 credits in entomology, 3 credits in plant pathology, weed science and soil conservation, and 4 credits in plant nutrition. Supporting electives must be selected from courses approved for this option.

Urban Affairs

This program, Resource Development in the Urban Environment, is part of the interdisciplinary Urban Affairs Program (see page 11), and provides students with an understanding of how human and natural resources pertain to urban affairs. Training deals with problems related to natural resources in contemporary society.

Students, with the help of advisors, develop individual programs which meet the college and program requirements, and contain the flexibility needed to accommodate their varying interests.

All students are required to complete 3 credits of introductory work in Urban Affairs and 15 additional credits selected from courses approved for this level. Basic science requirements include animal and plant biology (6–8), general chemistry (4), additional chemistry, physics, or natural science (4), and algebra/trigonometry (3). In the concentration, the program prescribes four groups of courses and the minimum credits required for each group. Eighteen of these credits shall apply to the Urban Affairs Program core requirement. Supporting electives shall be selected from recommended courses pertaining to resources (18), social sciences (9), and communication (9). Free electives (15–17).

Teacher Certification

Students in the animal science, plant science, or natural resources program who are interested in careers as secondary school teachers in agri-business and natural resources may meet the Rhode Island Department of Education certification requirements with appropriate advisement.

In addition to 36 credits of resource development coursework, the following courses in the supporting electives may be included: EDC 102 (3), PSY 113 (3), EDC 312 (3), RDE 444 (3), EDC 484 (9-12), EDC 485 (3), RDE 486 (1-6), and 9 credits in related mechanics. Students should select a second advisor from Resource Development Education to provide the necessary technical assistance.

Courses of Instruction

Course Codes

ACC - Accounting
ADE - Adult and Extension Education
AAF - African and Afro-American Studies
AVS - Animal and Veterinary Science
APG - Anthropology
ASP - Aquacultural Science and Pathology
ART - Art
AST - Astronomy
BGS - Bachelor of General Studies
BCP - Biochemistry and Biophysics
BIO - Biology
BOT - Botany
BSL - Business Law
CHE - Chemical Engineering
CHM - Chemistry
CVE - Civil and Environmental Engineering
CLA - Classics
CLS - Comparative Literature Studies
CMS - Communication Skills
CMD - Communicative Disorders
CPL - Community Planning
CSC - Computer Science
CNS - Consumer Studies
DHY - Dental Hygiene
ECN - Economics
EDC - Education
ELE - Electrical Engineering
EGR - Engineering
ENG - English
EHS - Environmental Health Science
EST - Experimental Statistics
FIN - Finance
FMT - Fisheries and Marine Technology
FSN - Food Science and Nutrition
FRN - French
GEG - Geography
GEL - Geology
GER - German
GRK - Greek
HLT - Health
HBW - Hebrew
HIS - History
HEC - Home Economics
HED - Home Economics Education
HPR - Honors Program
HCF - Human Development, Counseling, and Family Studies
HSS - Human Science and Services
IME - Industrial and Manufacturing Engineering
ISC - Information Science
INS - Insurance
IRE - Irish
ITL - Italian
JOR - Journalism
LRS - Labor and Industrial Relations
LAR - Landscape Architecture
LAN - Languages
LAT - Latin
LAS - Latin American Studies
LET - Letters
LIB - Library
LSC - Library and Information Studies
LIN - Linguistics
MGT - Management
MGS - Management Science
MAF - Marine Affairs
MKT - Marketing
MTH - Mathematics
MCE - Mechanical Engineering and Applied Mechanics
MTC - Medical Technology
MCH - Medicinal Chemistry
MIC - Microbiology
MSC - Military Science
MUS - Music
NRS - Natural Resources Science
NES - New England Studies
NUR - Nursing
OCE - Ocean Engineering
OCG - Oceanography
PCG - Pharmacognosy
PCL - Pharmacology and Toxicology
PHC - Pharmaceutics
PHP - Pharmacy Practice
PHL - Philosophy
PED - Physical Education
PHT - Physical Therapy
PHY - Physics
PLS - Plant Sciences
PSC - Political Science
POR - Portuguese
PSY - Psychology
RCR - Recreation
RLS - Religious Studies
RDE - Resource Development Education
REN - Resource Economics
RTH - Respiratory Therapy
RUS - Russian
SWF - Social Welfare
SOC - Sociology
SPA - Spanish
SPE - Speech Communication
TMD - Textiles, Fashion Merchandising and Design
THE - Theatre
UYA - University Year for Action Internship Program
URB - Urban Affairs
WMS - Women's Studies
WRT - Writing
ZOO - Zoology

All permanent undergraduate 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 to 099 are prefreshman and special undergraduate courses, and do not carry bachelor's degree credit. Those numbered 100 to 299 are lower division undergraduate courses and those numbered 300 to 399 are upper division undergraduate courses. The 400-level courses are generally limited to juniors and seniors majoring in a field, but are open to other advanced undergraduates and to graduate students with permission.

The 500-level courses, listed in this catalog by title line only, are graduate courses with a bachelor's degree usually prerequisite, but qualified seniors and honors students are admitted with permission. For a full description of these and courses at the 600- and 900-levels, see the *Graduate School Bulletin*.

Courses with two numbers, e.g., ACC 201, 202, indicate a year's sequence and the first course is either a prerequisite for the second or at least the two cannot be taken in reverse order without special permission. If a course is also offered by another department, this information appears following the course number. The roman numeral indicates the semester the course will be offered. *SS* means the course is offered during the Summer Session. The arabic numeral indicates the credit hours. 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 which 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 Registrar immediately before the preregistration period for each semester and again just before Registration Day. The schedule of courses 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 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 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

343 A General Survey of the Federal Income Tax *(II, 3)* Taxation for students with little or no previous work in accounting or business administration, emphasis on those aspects of taxation which are helpful to the individual. *(Lec. 3) Not open to accounting majors.* Staff

371, 372 Directed Study in Accounting *(I and II, 1-3 each)* Advanced work under the supervision of a member of the staff and arranged to suit the individual requirements of the student. *(Lec. 1-3) Pre: permission of instructor.* Staff

413 Contemporary Accounting Issues *(II, 3)* Interpretation of financial data. Case studies of current accounting theory in selected annual corporate reports. *Pre: 312 or permission of instructor. Not for graduate program credit.* 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 *(I, 3)* Accounting principles and policies for governmental and not-for-profit 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

535 Advanced Problems in Accounting *(II, 3)*
544 Taxation of Corporations and Shareholders *(II, 3)*
548 Accounting for Noncommercial Entities *(II, 3)*
562 Advanced Auditing *(II,3)*

Adult and Extension Education (ADE)

Program Director: Professor McCreight

488 Methods and Materials for Adult and Extension Education *(I and II, 3)* Techniques utilized in working with large and small groups. Hardware and software used effectively in adult and extension education identified and demonstrated. Communications in extension education studied in depth. *(Lec. 3)* Mallilo

492 Special Problems in Adult Education *(I and II, 1-3 each)* Specialized problems in adult and extension education. Seminars or supervised individual projects. *(Lec. or Lab.) Pre: permission of instructor.* Staff

African and Afro-American Studies (AAF)

Director: M. Hendrix

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)* Hendrix and Badejo

202 Introduction to Afro-American Culture *(II, 3)* Interdisciplinary survey of the social origins of Afro-American culture. *(Lec. 3)* Badejo

250 (or APG 250) Africanity *(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. Hendrix, Badejo and Pollnac (F)

360 (or ENG 360) Africana Folk Life *(1, 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 in fall 1988.* Badejo

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. *Pre: permission of director.* Hendrix and 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. *Pre: APG 313 or PSC 201 or HIS 388 or permission of instructor.* Milburn and Hendrix

474 Topics in Pan-African Literature See English 474.

Animal and Veterinary Science (AVS)

Chairperson: Professor Meade (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: 101. May be taken concurrently with 101.* Millar and 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, 102.* Staff

201 Man and His Animals *(II, 3)* Study of the interrelationships between man and domestic animals with emphasis on pets; including breeds of dogs and cats, pet nutrition, behavior, breeding, and areas of topical interest. *(Lec. 3)* 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)* Millar

301, 302 Seminar in Animal and Veterinary Science *(I and II, 1)* Readings, reports, lecures, and discussions on scientific topics in animal and veterinary science. Subject matter adapted to student and faculty interest. *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. Participation in field trips required. Gray

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. Millar and Rhodes

331 Anatomy and Physiology *(I, 3)* Fundamentals of anatomy and physiology of domesticated animals. *(Lec. 3) Pre: ZOO 111, junior standing.* Rhodes

332 Animal Diseases *(II, 3)* Specific diseases of avian and mammalian species; etiology, symptoms, and control. *Pre: 331.* Chang

343 Behavior of Animals that Serve Man *(II, 3)* Examination of the basis for, and exhibition and control of behavioral patterns of domestic animals. *(Lec. 3) Pre: 101 or permission of instructor.* Nippo

361 Game Bird Propagation and Management *(I, 3)* Principles and techniques of game bird propagation, hatchery operation, confinement rearing, nutrition, disease problems, and shooting preserve management. *(Lec. 2, Lab. 2) Pre: BIO 102 or ZOO 111.* Millar

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: ZOO 111 or BIO 102A.* Gray

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 102 or ZOO 111.* Rhodes

382 Poultry Business *(II, 3)* Poultry enterprises, methods of organization, financing, business management; emphasis on current developments within the industry affecting business decisions. *(Lec. 2, Lab. 2) In alternate years, next offered 1989-90.* Millar

399 Animal Science Internship *(I and II, 1-6)* Options in various professional experience programs involving the animal and veterinary sciences. May be repeated to a maximum of six credits. *Pre: permission of department. S/U credit.* Staff

412 Animal Nutrition *(II, 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, junior standing.* Nippo

415 Physiology of Lactation *(I, 3)* Endocrine control, milk precursors, physiology of milk production, and anatomy of mammary system including vascular, lymphatic and nervous system. *(Lec. 3) Pre: junior standing. In alternate years, next offered 1988-89.* Rhodes

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: 352 or equivalent. In alternate years, next offered 1989-90.* Gray

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 or permission of instructor.* Gray

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 or permission of instructor.* Staff

472 Physiology of Reproduction *(II, 3)* Anatomy and physiology of reproduction, emphasis on domestic farm animals and fowl. Endocrine aspect of reproduction. *(Lec. 2, Lab. 2) Pre: ZOO 111 and permission of instructor.* Rhodes

491, 492 Special Projects *(I and II, 1-3 each)* Work which meets individual needs of students in aquaculture, animal, poultry, and food science. *(Lec. and/or Lab. according to nature of project) Pre: permission of department.* Staff

501, 502 Graduate Seminar *(I and II, 1 each)*
510 Recent Advances in Domestic Animal Physiology *(II, 2)*
542 Advances in Animal Virology *(II, 2)*
591, 592 Research Problems *(I and II, 3 each)*

Anthropology (APG)

Chairperson: Professor Loy (Sociology and Anthropology)

200 (or LIN 200) Language and Culture *(I or II, 3)* Crosscultural survey of the interaction of culture and language. Introduction to various fields of linguistic research emphasizing descriptive 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, Kelley (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 people and cultures around the world. *(Lec. 3)* Staff (S)

220 Introduction to the Study of Language
See Linguistics 220.

250 Africanity
See African and Afro-American Studies 250.

280 Human Identification *(I or II, 3)* Introduction to applied anthropology with examination and analysis of the human body for forensic reconstruction. Academic and laboratory skills will be learned for determination of age, sex, race, stature, and cause of death. *(Lec. 1, Lab. 4)* Kelley

300 Human Fossil Record *(I, 3)* 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) Pre: 201 or 202 or permission of instructor.* Kelley

301 Comparative Primate Morphology *(I, 3)* Survey of the form and structure of living and fossil primates, including humans. Examination of correlations between morphology and locomotor pattern, feeding ecology, and habitat preference. Laboratory study of primate material. *(Lec. 2, Lab. 2) Pre: 201 or permission of instructor.* Kelley

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. In alternate years, next offered in 1989-90.* Poggie

303 New World Prehistory *(I or II, 3)* Reconstruction of American Indian culture 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

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)* Lynch (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 1986-87.* 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 1989-90.* 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)* Lynch (F)

326 Anthropology of Law *(I or II, 3)* Examination of the range of procedures for handling disputes in selected societies around the world. Emphasis on relation of law to its cultural context. *(Lec. 3)* Lynch

327 Roots of Bioanthropology *(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.* Kelley

390 Human Sociobiology and Ethology
See Sociology 390.

400 Bones, Mummies, and Disease *(II, 3)* Examines the role of diseases such as syphilis, tuberculosis, leprosy, cancer, and dietary deficiencies in shaping the evolution of human populations. *(Lec. 3) Pre: introductory physical anthropology, biology or zoology or permission of instructor.* Kelley

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. *(Lec. 3) Pre: 203 or permission of instructor. In alternate years, next offered in 1988-89.* Staff

405 Psychological Anthropology *(I or II, 3)* Study of human behavior in different cultures employing psychological concepts and theories. *(Lec. 3) Pre: 203 and 6 credits of 300-level courses in anthropology or permission of department.* Pollnac

409 Anthropological Linguistics *(I or II, 3)* Use of the linguistic model in the analysis of human cultural products, including folk narrative and kinship systems. Emphasis on techniques used in the formal analysis of both verbal and non-verbal behavior. *(Lec. 3) Pre: 200 or LIN 201.* 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

470 Problems in Anthropology *(I and II, 3)* Staff-guided study and research, seminar, or individual program. *(Lec. 3 or Lab. 6) Pre: permission of department.* Staff

475 American Indian Cultures of the Southwest (SS,6) Summer field program in Southwestern U.S. Archaeology and native American culture history, from earliest times through European colonization and modern reservation periods. Visits to archaelogical sites, museums, cultural centers, reservations. *(Lec. 2, Lab. 12) Pre: 6 credits in anthropology or permission of instructor. Not for graduate credit.* Turnbaugh and Lynch

Aquacultural Science and Pathology (ASP)

Chairperson: Professor Meade (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 102 or ZOO 111, or permission of instructor.* Durfee

352 General Genetics *(I, 3)* Introduction to genetic principles and concepts with applications and implications of these concepts to man and other species. *(Lec. 3) Pre: BOT 111, or BIO 101 or 102 or ZOO 111. Not open to students who have taken BOT 352.* Staff

354 Genetics Laboratory *(I, 2)* Basic principles of heredity demonstrated with *Drosophila, Coturnix,* and plants. *(Lab. 4) Pre: 352 or BOT 352, may be taken concurrently with 352. Not open to students who have taken BOT 354 or 454.* Staff

381 Shellfish Aquaculture *(I,3)* Worldwide culture of marine and freshwater crustaceans and molluscs. 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.* Durfee

401 Introduction to Pathology *(II, 3)* General and systemic pathology including cellular changes, etiology and pathogenesis of inflammation, metabolic and neoplastic processes. *(Lec. 3) Pre: MIC 201 or 211, ZOO 242, and/or equivalent; junior standing, or permission of instructor.* Wolke

452 (or FMT 452) Industrial Fishery Technology *(I, 3)* Utilization of industrial fish, production of fish meal, fish oil, condensed fish solubles, fish protein concentrate; handling, packaging, storage, and transportation. Nutritive quality, market value, and demand relationships for fish proteins. *(Lec. 2, Lab. 3) Pre: permission of instructor.* Meade

476 The Genetics of Fish *(II, 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. 2) Pre: 352.* Smith

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, or permission of instructor.* Meade

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: ZOO 341 or 345 (or equivalent) or permission of instructor.* Staff

501, 502 Seminar *(I and II, 1 each)*
532 Experiment Design *(II, 3)*
534 (or MIC 534) Animal Virology *(II, 3)*
536 (or MIC 536) Virology Laboratory *(II, 2)*
538 (or MIC 538) Epidemiology of Viral and Rickettsial Diseases *(II, 2)*
555, 556 Pathology Rotation *(I, II, 3 each)*
584 Advanced Aquaculture Systems *(II, 3)*
586 Fish Nutrition *(I, 3)*
591, 592 Special Projects *(I and II, 1-3 each)*

Art (ART)

Chairperson: Associate Professor Roworth

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)

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)

203 Color *(I and II, 3)* Visual perception of color and manipulation of light as they pertain to two- or three-dimensional formulations. *(Studio 6)* Leete (A)

207 Drawing I *(I and II, 3)* Visual perception and observation, using nature structures, drawing from live 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 once with permission of instructor. Pre: permission of instructor.* Staff

215 Filmmaking I *(I and II, 3)* Introduction to basic filmmaking technique and theory. Emphasis on film as a visual art. Required projects and readings. *(Studio 6) May be repeated once with permission of instructor. May be taken once for general education credit.* Keller (A)

221 Two-dimensional Studio II *(I and II, 3)* Techniques of painting, utilizing as reference the natural and manmade environments. Traditional and contemporary materials. *(Studio 6) Pre: 101 and 207.* Fraenkel, Leete

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 department.* 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.* Rohm

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)* Staff (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)* Staff (A)

263 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)* Onorato (A)

265 Modern French Art—Nineteenth and Twentieth Centuries *(I or II, 3)* Painting and sculpture in France from 1789 to 1950, with emphasis on the social background and relationships with other art forms. *(Lec. 3)* Staff (A) (F)

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 once with permission of instructor. May be taken once for general education credit. Fall 1988 Topic: New England Architecture.* Onorato (A)

285 Women in Art *(I, 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 Gallery Internship *(I and II, 1)* Practicum in the operation of the Main Gallery, including contacting artists, installation of exhibitions, publications, coordinating publicity and openings, lectures, symposia and performances. *(Practicum 3) Pre: permission of department. May be repeated twice for a maximum of three credits.* Gallery Director

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 another instructor for 302. *Pre: enrollment in Honors Colloquium and/or permission of chairperson and instructor.* 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) May be repeated with permission of instructor and depart-*

ment chairperson. Pre: permission of instructor. Fall 1988: Portraiture. Klenk

309, 310 Drawing III and IV *(I, 3 each) 309:* Further problems, emphasis on independent investigation in analysis, planning, and supportive notation. *310:* Continuation. *(Studio 6) 310 may be repeated with permission of instructor. Pre: 208 or permission of instructor for 309; 309 for 310.* Klenk

314 Photography II *(I and II, 3)* Continuation of 213. *(Studio 6) May be repeated with permission of instructor. Pre: 213.* Staff

316 Filmmaking II *(I and II, 3)* Continuation of 215 with added emphasis on sound. Required projects and reading. *(Studio 6) Pre: 215. May be repeated with permission of instructor.* Keller

322 Two-dimensional Studio III *(I and II, 3)* Continuation of 221. *(Studio 6) Pre: 221. May be repeated with permission of instructor.* Fraenkel, 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) May be repeated with permission of instructor. Pre: 233 or permission of department.* Richman

337 Printmaking III *(I and II, 3)* Semi-independent work in printmaking media. Introduction of aluminum plate and photolithography. *(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.* Pagh

344 Three-dimensional Studio III *(I and II, 3)* Continuation of 243. *(Studio 6) May be repeated with permission of instructor. Pre: 243 or permission of instructor.* Rohm

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 department.* Mensel (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 department.* Mensel (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 department.* 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)

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 department.* 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 another instructor for 372. *Pre: enrollment in Honors Colloquium and/or permission of chairperson and instructor; 371 for 372.* Staff

374 Topics in Film *(II, 3)* Explores the social, historical, and aesthetic development of the cinema from 1895 to the present. Lectures (3 hrs.) and required film screenings. *May be repeated twice with permission of instructor. Spring 1989: Women in Film.* Keller (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. *May be repeated twice with permission of instructor. (Lec. 3)* Keller

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. *Pre: Senior standing and permission of department for 405; 405 for 406.* Staff

461 Topics in Methods, Theory and Criticism *(I in alternate years or II, 3)* Art history methods or selected topics in the theory and criticism of art. Topics to be announced. *(Lec. 3) Pre: permission of department. May be repeated once with permission of instructor.* Holmes

462 Contemporary Art Seminar: Art Since 1945 *(II, 3)* Analysis of contemporary work and its relation to earlier movements. *(Lec. 3) Pre: 363 or permission of department.* Onorato

469, 470 Art History—Senior Projects *(I and II, 3-6 each)* Intensive, independent work on a project determined after consultation with the student's project advisor. *(Lec. 3-6) Pre: permission of department.* 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. *(Lec. 3) Pre: permission of department.* Staff

501, 502 Graduate Studio Seminar I and II *(I and II, 3 each)*

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)* Penhallow (N)

334 Optics
See Physics 334.

406 Atmospheric Physics I
See Physics 406.

407 Atmospheric Physics II
See Physics 407.

408 Introduction to Astrophysics *(II, 3)* Application of photometry and spectroscopy to stellar composition, structure, and evolution. Radio astronomy and the structure of our galaxy. Energy production in stars and galaxies. Observational cosmology. *(Lec. 3) Pre: PHY 112 or 214. 108 is recommended but not required.* Penhallow

484 Laboratory and Research Problems in Physics
See Physics 484.

491, 492 Special Problems
See Physics 491, 492.

Bachelor of General Studies (BGS)

Coordinator: Associate Professor McKinney

100 Pro-Seminar *(I or II, 4)* Introduction to critical approaches to learning with emphasis on reading and rhetorical skills appropriate to college students. *Required of BGS students. 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. *Required of all 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. *Required of all 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. *Required of all 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. *Required of all BGS Human Studies majors. Pre: completion of 30 credits of major.* 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. *Required of BGS students. Pre: senior standing in BGS program and approval of faculty supervisor and BGS coordinator.* Staff

Biochemistry and Biophysics (BCP)

Chairperson: Professor 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.* Dain and Fisher

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. *(Lec. 1, Lab. 3) Pre: 311 (may be taken concurrently).* Tremblay

401 (or MIC 401) Quantitative Cell Culture *(I, 3)* Methods of mammalian cell culture to examine the normal and abnormal cell in the study of cancer, genetic diseases, the radiation syndrome, nutrition, and other problems. *(Lec. 3) Pre: any two of the following: BIO 101, 102, BOT 111, ZOO 111 or MIC 210; senior standing or above.* Fisher

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 department.* Fisher and 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. *Pre: 311 (may be taken concurrently).* 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. *Pre: any two of the following: BIO 101, 102, BOT 111, ZOO 111 or MIC 201 or 211. Offered in alternate years. Next offered fall 1990.* Fisher

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 students majoring in chemistry.* Hartman

491, 492 Research in Biochemistry and Biophysics *(I and II, 1-6 each)* Special problems. Student outlines the problem, carries on experimental work, presents the conclusions in a report. *(Lab. 2 to 12) Pre: permission of instructor. Not for graduate credit.* Staff

503 (or MIC 503) Electron Microscopy *(I, 2)*
505 (or MIC 505) Laboratory in Electron Microscopy *(I, 3)*
521 Physical Biochemistry *(II, 3)*
523, 524 Special Topics in Biochemistry and Biophysics *(I and II, 1-6 each)*
542 Proteins: Purification and Characterization *(II, 3)*
572 (or PLS 572) Plant Biochemistry *(II, 3)*
581, 582 General Biochemistry *(I and II, 3 each)*
584 Membrane Biochemistry *(II, 3)*
585 Recent Advances in Receptor Research *(I, 1)*

Biology (BIO)

Chairpersons: Associate Professor Sheath (Botany), Professor Laux (Microbiology) and Professor Cobb (Zoology)

101 (or BOT 101) Biology of Plants *(I and II, 3)* Introduction to major concepts of biology through a study of plants, including structure, function, reproduction, inheritance, ecology, and topics of current interest. Designed for non-science majors. *(Lec. 2, Lab/Rec. 1) Not open to students who have passed BOT 111.* Albert or Koske (N)

102 General Animal Biology *(I and II, 3)* Introduction to life processes of animals, including man. Examines biological aspects of inheritance, ecology, behavior, animal survey, and regulation of biosystems. Laboratory surveys general concepts of animal biology. *(Lec. 2, Lab. 2)* Goldsmith (N)

Note: Students who elect 101 may not enroll in BOT 111, and those who elect 102 may not enroll in ZOO 111.

Botany (BOT)

Chairperson: Associate Professor Sheath

101 Biology of Plants
See Biology 101.

111 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 who have passed BIO 101.* Hauke or Sheath (N)

216 Algae, Fungi and Human Affairs *(II, 2)* Impact of algae and fungi on human activities and technology. Their effect on human affairs from a botanical viewpoint, as sources of food and toxins, energy and industrial products, as agents of plant and animal disease, as producers of antibiotics, and their role in the environment. *(Lec. 2) Pre: 111 or BIO 101.* Harlin

245 Plant Physiology *(I, 3)* Processes underlying the physiology of the whole plant. Emphasis on fundamental principles and interrelationships of plant processes in growth and development. *Pre: 111, CHM 112, or permission of instructor.* Albert

253 Plant Cell Structure and Function *(I,3)* Cytology, ultrastructure and metabolism of cells throughout the plant kingdom. Topics include carbon and energy dynamics, membrane function, replication and evolution at the cellular level. *(Lec. 2, Lab. 3) Pre: 111 or permission of instructor.* Staff

262 Introductory Ecology
See Zoology 262.

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: 111 or permission of instructor.* Hauke

321 General Morphology *(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: 111 or permission of instructor.* Hauke

323 Field Botany and Taxonomy *(1, 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 classfication. *(Lec. 2, Lab. 4) Pre: 101 or 111.* Killingbeck

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. 3, Lab. 2) Pre: 111 or permission of instructor.* Mueller

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: 111 and ZOO 111 or permission of instructor. Not open to students who have taken ASP 352.* Mottinger

364 Laboratory in Quantitative Population Biology
See Zoology 364.

418 Marine Botany *(I, 3)* Field and laboratory study of ecology and taxonomy of various communities of marine plants, primarily on seaweeds and seagrasses. Methods of collecting, fixation, herbarium processing, and identification. Individual projects required. *(Lec. 2, Lab. 3) Pre: 321 or permission of instructor. 262 suggested. In alternate years, next offered 1989-90.* Harlin or Sheath

419 Freshwater Botany *(I, 3)* Field and laboratory study of ecology and taxonomy of various communities of freshwater microalgae, macroalgae, and higher plants. Methods of collecting, fixation, enumeration, identification, and crop estimation. Individual collections required. *(Lec. 2, Lab. 3) Pre: 321 or permission of instructor. 262 suggested. In alternate years, next offered 1988-89.* Sheath

432 Mycology: Introduction to 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: BIO 101 or BOT 111; 321 recommended.* Goos

437 (or ZOO 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. *Pre: MIC 211, BOT 352, and BCP 311 or permission of instructor.* Norris or Goldsmith

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. 2, Lab. 3) Pre: 2 semesters of biology, BCP 311, junior standing, or permission of instructor.* Norris

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 1988-89.* Mottinger

455 Marine Ecology
See Zoology 455.

457 Marine Ecology Laboratory
See Zoology 457.

465 Phycology: An Introduction to the 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: 111, 221 recommended.* Sheath

490 Modern Techniques in Botanical Sciences *(I and II, 2)* Experience using the equipment and techniques of botanical research such as radioisotopic tracers, analysis of organic and inorganic constituents, productivity, hydrobotany, cell and tissue culture, and light microscopy. *(Lec. 2, Lab. 4 for six weeks). May be repeated with different topic (A—G). Pre: major in biological science, junior standing, and permission of instructor.* Staff

A Radioisotope techniques
B Analysis of organic constituents in plant tissues
C Analysis of inorganic nutrients and trace elements in plant tissues
D Plant productivity and biomass analysis
E Hydrobiological dynamics
F Plant cell and tissue culture methods
G Modern applications of light microscopy

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. *(Lec. 1-3 or Lab. 2-6) Offered only to undergraduates on arrangement with staff.* Staff

511 Special Readings in Developmental Plant Anatomy *(I, 3)*
512 Morphology of Vascular Plants *(I, 3)*
521 (or MIC 521) Recent Advances in Cell Biology *(I, 2)*
522 Plant Molecular Biology *(I, 4)*
524 Methods in Plant Ecology *(II, 3)*
534 Physiology of the Fungi *(II, 3)*
538 Ecology of Fungi *(II, 3)*
542 Medical Mycology *(II, 3)*
546 Seminar in Plant Stress Physiology *(II, 1-2)*
551 Seminar in Aquatic Botany *(I, 1)*
554 Cytogenetics *(I, 4)*
555 Algal Cell Biology *(II, 3)*
559 Physiological Ecology of Marine Macroalgae *(I, 3)*
562 Seminar in Plant Ecology *(II, 2)*
579 Advanced Genetics Seminar *(I and II, 1)*
581, 582 Botany Seminar *(I and II, 1 each)*
590 Botanical Techniques *(I, 1)*
591, 592 Botanical Problems *(I and II, 1-3 each)*
593, 594 Botanical Problems *(I and II, 1-3 each)*

Business Law (BSL)

Chairperson: Professor Sink (Management)

333 Law in a Business Environment *(I, 3)* Contractual relations prefaced by a survey of origins, framework, and concepts of our legal system. *(Lec. 3) Pre: junior standing. Open to non-business students only by permission of department.* Staff

334 Law in a Business Environment *(II, 3)* Operation of the system of jurisprudence as it affects agency business organizations and the sale of merchandise. *(Lec. 3) Pre: 333. Open to non-business students only by permission of department.* 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

501 Law and Accounting *(I, 3)*

Chemical Engineering (CHE)

Chairperson: Professor Barnett

101 Foundations of Chemical Engineering *(I and II, 1)* An introduction to chemical engineering. Approaches to problem solving. Numerical presentation of data and data analysis. Block diagrams and flow charts. *(Lab. 3)* Staff

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. 2, Lab. 3) Pre: CHM 112 or 192.* Staff

272 Introduction to Chemical Engineering *(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.* Staff

313 Chemical Engineering Thermodynamics *(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.* Staff

314 Chemical Engineering Thermodynamics *(II, 3)* Continuation of 313 with applications to compression, refrigeration, phase and chemical equilibria. *(Lec. 2, Lab. 3) Pre: 313.* Staff

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. *(Lec. 1, Lab. 3) Pre: credit or registration in 348.* Bose

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 who have received credit for 333 or 437. Pre: CHM 101, 103 or 191.* Rockett

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 non-equilibrium. *(Lec. 2, Lab. 3) Pre: junior standing or permission of instructor. Not open to students who have received credit for 332 or 437.* Rockett

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.* Shilling and Gray

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 registration in 313 or MCE 341.* Staff

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.* Staff

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.* Staff

351, 352 (or OCE 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.* Estrin

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. *Pre: junior standing or permission of department.* Staff

403, 404 (or OCE 403, 404) Introduction to Ocean Engineering Processes I and 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 211, or 220 and credit or registration in CHE 347 or MCE 354.* Staff

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 department.* 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

439 Non-Destructive Evaluation of Materials *(II, 3)* Non-destructive evaluation of the integrity of materials. X-ray, ultrasonic, acoustic, infarared, magnetic evaluation techniques in theory and practice. *(Lec. 3) Pre: 333, 332, or 437.* Brown and Gregory

447 (or FSN 447) Food Engineering I *(I, 4)* Basic principles underlying unit operations of chemical engineering applied to food industries. Topics covered include heat transfer, fluid flow, extraction and drying. Not for credit in chemical engineering curriculum. *(Lec. 3, Lab. 3) Pre: CHM 228, PHY 112, MTH 109 and permission of instructor.* 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.* Staff

471 Analysis of Engineering Data *(I, 3)* Application of some of the modern mathematical techniques to the analysis of engineering data. *(Lec. 3) In alternate years, next offered 1989-90.* Staff

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. *(Lec. or Lab. according to nature of the problem. Credits not to exceed a total of 12.) Pre: permission of department. Not for graduate credit.* Staff

501, 502 Graduate Seminar *(I and II, 1 each)*
513 Advanced Chemical Engineering Thermodynamics *(I, 3)*
530 Polymer Chemistry *(I, 3)*
531 Polymer Engineering *(I or II, 3)*
532 Ceramic Engineering *(I, 3)*
533 Engineering Metallurgy *(II, 3)*
534 (or OCE 534) Corrosion and Corrosion Control *(I, 3)*
535 (or OCE 535) Advanced Course in Corrosion *(II, 3)*
537 Advanced Materials Engineering *(II, 3)*
539 Electron and Light Microscopy of Solids *(I, 3)*
540 Phase Equilibria *(II, 3)*
541 Transport Phenomena I *(I, 3)*
542 Advances in Interfacial Phenomena *(I, 3)*
548 (or FSN 548) Separations for Biotechnology *(II, 3)*
549 (or FSN 549) Food and Biochemical Engineering III *(II, 3)*
560 Chemical and Physical Processes of Integrated Circuit Fabrication *(I, 3)*
572 X-ray Diffraction and Fluorescence *(I, 3)*
573 Mechanical Metallurgy *(I or II, 3)*
574 Biochemical Engineering *(I, 3)*
575 (or FSN 575) Biochemical Engineering II *(II, 3)*
581 Introduction to Nuclear Engineering *(I and II, 3)*
582 Radiological Health Physics *(I, 3)*
583 Measurements in Nuclear Engineering *(I, 3)*
591, 592 Special Problems *(I and II, 1-6 each)*

Chemistry (CHM)

Chairperson: Professor Fasching

100 Chemistry of Our Environment *(I and II, 3)* Elementary chemistry for non-science majors, emphasizing chemical aspects of the human environment. Chemistry of the biosphere, of pollution, and aspects of industrial chemistry. *(Lec. 3)* Peterson and Staff (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 who have received credit for 103 or 191.* J. Vittimberga and Staff (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, enthalphy, molar heat capacity, and electrochemistry. *(Lab. 3) Pre: prior or concurrent registration 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 who have received credit for 101 or 191.* Staff (N)

105 Laboratory for Chemistry 103 *(I, 1)* Fits course content of 103. *(Lab. 3) Pre: prior or concurrent registration 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 103. Not open to students who have passed 104.* Euler (N)

114 Laboratory for Chemistry 112 *(I or II, 1)* Semi-micro-qualitative analysis and its applications. *(Lab. 3) Pre: prior 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. 3) Pre: 101, 102 or 103, 105. Concurrent registration in 126 required when curriculum specifies laboratory. Not open to students majoring in chemistry or chemical engineering.* Rosen and Abell (N)

126 Laboratory for 124 *(I and II, 1)* Introduction to chemistry procedures, with emphasis on properties of substances of physiological significance. *(Lab. 3) Pre: prior or concurrent registration in 124. Not open to students majoring in chemistry of chemical engineering.* Staff

191 General Chemistry *(I, 5)* Includes descriptive inorganic chemistry, qualitative analysis, and an introduction to quantitative analysis. Required for students in the chemistry curriculum who have had a year of high school chemistry. *(Lec. 4, Lab. 3) Not open to students who have received credit for 101 or 103.* Kirschenbaum (N)

192 General Chemistry *(II, 5)* Continuation of 191. *(Lec. 4, Lab. 3)* Durand (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.* Force

226 Organic Chemistry Laboratory *(I and II, 2)* Common techniques and typical preparative methods in both aliphatic and aromatic series. *(Lab. 6) Pre: prior registration in 227. Not open to students who have received credit for 229 or 230.* Goodman and Cheer

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.* Cheer and B. Vittimberga

228 Organic Chemistry Lecture II *(I or II, 3)* Continuation of 227 with emphasis on the aromatic series. *(Lec. 3) Pre: 227.* Cheer, Vittimberga

229 Organic Chemistry Laboratory I *(SS, 1)* Common techniques and typical preparative methods in aliphatic series. *Pre: prior or concurrent registration in 227.* Goodman

230 Organic Chemistry Laboratory *(II and SS, 1)* Continuation of 229 with emphasis on the aromatic series. *To be taken only by students requiring a second credit of organic laboratory. Pre: 229 or equivalent and prior or concurrent registration in 228.* Staff

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 who have passed 227.* Goodman

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 who have passed 228.* Goodman

335 Physical Chemistry Laboratory *(I and II, 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, 432.* Yang and Peterson

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. *(Lab. 3-18) May be repeated for a total of six credits each. Pre: permission of instructor.* Staff

392 Seminar in Chemistry *(II, 1)* Preparation and presentation of papers on selected topics in chemistry. Required of seniors in chemistry. *(Lec. 1) Undergraduate credit only. Pre: prior or concurrent registration in 228 or 432.* 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

402 Physical Inorganic Laboratory *(II, 2)* Synthesis of inorganic compounds emphasizing inert atmosphere and vacuum line techniques; characterization by spectroscopic and electromechanical 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 prior or concurrent registration in 432.* P. Brown

414 Instrumental Methods of Analysis Laboratory *(II, 2)* Applications of instrumental methods to the solution of problems in analytical chemistry. *(Lab. 6) Pre: prior or concurrent enrollment in 412.* Force

425 Qualitative Organic Analysis *(I, 2)* Methods of identification of pure organic compounds. Separation of mixtures and identification of components by infrared and nuclear magnetic resonance spectroscopy. *(Lab. 6) Pre: 292 or equivalent and prior or concurrent registration in 427.* Abell

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.* Abell

431, 432 Physical Chemistry *(I and II, 3 each) 431:* Gas laws, kinetic theory, laws of thermodynamics, chemical equilibrium, phase equilibria, and electrochemistry. *432:* Atomic theory, quantum chemistry, bonding, molecular interactions, and chemical kinetics. *(Lec. 3) Pre: 112 or 192 and MTH 142, PHY 111 and 112 or PHY 213, 214, 285 and 286. May be taken for graduate credit only by students whose disciplines do not require physical chemistry as part of their undergraduate programs.* Freeman

501 Advanced Inorganic Chemistry I *(I, 3)*
502 Advanced Inorganic Chemistry II *(II, 3)*
504 Physical Methods of Inorganic Chemistry *(II, 3)*
511 Advanced Analytical Chemistry I *(I, 3)*
512 Advanced Analytical Chemistry II *(II, 3)*
518 Radiochemistry *(II, 3)*
521 Advanced Organic Chemistry I *(I, 3)*
522 Advanced Organic Chemistry II *(II, 3)*
531 Advanced Physical Chemistry I *(I, 3)*
532 Advanced Physical Chemistry II *(II, 3)*
536 Molecular Spectroscopy and Structure *(II, 3)*
566 Foundations for Advanced Chemical Research *(I, II, 2-6)*

Civil and Environmental Engineering (CVE)

Chairperson: Professor Kovacs

216 Introduction to Civil and Environmental Engineering System *(I, 3)* Introduction to a wide range of civil and environmental engineering topics. Emphasis on application of mathematical techniques and computer programming to the solution of problems. *(Lec. 3) Pre: MTH 141, CSC 201.* Staff

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, indeterminate beams. *(Lec. 3) Pre: MCE 162.* Staff

304 Introduction to Professional Practice I *(II, 1)* Discussion with faculty and visiting engineers and other speakers on curriculum and career planning, professional practice and ethics, employment opportunities, and graduate study. *(Lab. 2) Required of all civil engineering students in their junior year.* Staff

305 Introduction to Professional Practice II *(I, 1)* Discussion with faculty and visiting engineers and other speakers on curriculum and career planning, professional practice and ethics, employment opportunities, and graduate study. *(Lab. 2) Required of all civil engineering students in their senior year.* Staff

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.* Urish

322 Civil Engineering Laboratory *(I and II, 2)* Properties and behavior of engineering materials. Directed work in concrete and experimental stress analysis. Independent student projects. *(Lec. 1, Lab. 3) Pre: 220.* Staff

334 Construction Planning and Specifications *(II, 3)* Introduction to construction planning; procedures involved in construction activities with major emphasis on heavy construction. *(Lec. 3) Pre: 220.* Staff

347 Highway Engineering *(I or 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: 216.* Lee

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. 3, Lab. 2) Pre: MTH 243 or permission of department.* Staff

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; MCE 254 to be taken concurrently.* Kovacs, Silva

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. *Pre: junior standing or permission of department.* 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: 216.* Marcus

406 (or OCE 406) Introduction to Coastal and Ocean Engineering *(II, 3)* Wave theory and forecasting, beach erosion, sediment transport, wave forces, effect of pollutants on water quality, materials for ocean construction. *(Lec. 3) Pre: junior standing in civil engineering. Not for graduate program credit.* Staff

407 (or OCE 407) Project in Ocean Engineering *(II, 3)* Independent study, design project, or research project on an approved topic related to the ocean environment. *Pre: 491 or permission of instructor. Not for graduate program credit.* Staff

411 (or OCE 411) Basic Coastal Measurements *(I, 3)* Basic coastal measuring exercises from boats, in-situ, and on laboratory samples. Included will be measurement of current and tide, sediment transport and erosion, sediment testing, water testing, and bottom profiling. *(Lec. 1, Lab. 3) Pre: advanced standing in civil engineering or permission of instructor. Not for graduate program credit.* 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

446 Transportation Engineering *(II, 3)* Transportation planning and design, technological characteristics and design considerations of major transportation system. *(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

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 degree program credit.* Staff

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. 3, Lab. 3) Pre: 353. Not for graduate degree program credit.* Staff

470 Water and Wastewater Transport Systems *(II, 3)* Analysis of water storage and transmission. Design of water distribution and wastewater collection systems. Pumps and pumping stations. *Pre: 370 or 374 or permission of instructor. Not for graduate degree program credit.* Staff

471 Water and Wastewater Treatment Systems *(I, 3)* Development of water quality standards. Design and analysis of physical, chemical, and biological treatment processes and their application to water and wastewater purification systems. *(Lec. 2, Lab. 3) Pre: 374 or permission of instructor. Not for graduate degree program credit.* Staff

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 department.* 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 years.* Thiem

475 Water in the Environment *(II, 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 calendar years.* Urish

478 Solid Waste Disposal and Management *(II, 3)* Sources, collection and treatment methods for the removal of solid wastes from the environment. Recovery and re-use of waste materials. Economics of solid wastes and by-products. Interrelation between solid wastes, air and water pollution. *(Lec. 3) Pre: permission of department.* Poon

481 Soil Behavior *(I, 3)* Behavior of granular and cohesive soils with experimental determinations of soil properties. Emphasis on shearing strength and seepage studies. *(Lec. 2, Lab. 3) Pre: 381 or permission of instructor.* Kovacs and Silva

483 Foundation Engineering *(II, 3)* Application of the principles of soil mechanics to the design of sheet piling, cofferdams, and wharves. Advanced problems in the selection and design of foundations for major structures including buildings, bridges, walls, dams, etc.; case studies. *(Lec. 2, Lab. 3) Pre: 381.* Kovacs and Silva

485 Engineering Geophysics
See Geology 485.

491, 492 Special Problems *(I and II, 1-6 each)* Advanced work, under supervision of a member of the staff and arranged to suit individual requirements of the student. *(Lec. or Lab. according to nature of problems. Credits not to exceed a total of 12) Pre: permission of department.* Staff

495 Civil and Environmental Engineering Systems *(I, 3)* Practical civil and environmental engineering projects, broad in scope, in the areas of water resources, structures, pollution control and transportation, are studied, analyzed, designed and discussed. *(Lec. 3) Pre: senior standing in civil engineering. Not for graduate degree program credit.* Marcus

523 (or OCE 523) Coastal Structures *(II, 3)*
545 Pavement Design *(I, 3)*
546 (or CPL 546) Urban and Rural Transportation *(I, 3)*
547 Geometric Design of Highways *(I, 3)*
548 Pavement Materials and Mix Design *(II, 3)*
551 Finite Element Analysis in Civil Engineering *(I or II, 3)*
556 Variational Methods in Structural Engineering *(I, 3)*
560 Structural Design *(I or II, 3)*
565 Structure Dynamics *(I or II, 3)*
568 (or MCE 568) Theory of Plates *(I or II, 3)*
570 Sanitary Chemistry *(I, 3)*
571 Sanitary Chemistry Laboratory *(II, 3)*
572 Biosystems in Sanitary Engineering *(I or II, 3)*
573 Theory of Water Purification and Treatment *(I, 3)*
575 Open Channel Hydraulics *(I or II, 3)*
583 Advanced Foundation Engineering *(I, 3)*
585 Soil Dynamics *(II, 3)*
586 Physico-chemical Properties of Soils *(I, 3)*
587 Groundwater Flow and Seepage Pressure *(I, 3)*
588 Groundwater Hydrology *(II, 3)*
591, 592 Special Problems *(I and II, 1-6 each)*
596 Numerical Methods in Structural Engineering *(I or II, 3)*

Classics (CLA)

Chairperson: Professor Dornberg (Languages)

394 Greek Mythology and Religion: Gods and the Universe *(I and II, 3)* Ancient Greek gods and cults. Cosmogony, succession, anthropogony, cosmic catastrophe, Hellenistic and late classical developments in theology and cult practice. Readings in English translation, color slides. *(Lec. 3)* Staff (A) (F)

395 Greek Mythology: Gods, Heroes, and Humans *(I, and II, 3)* The hero in ancient Greek epic and drama. Epic cycles, historical legend, folktale. Hellenistic developments in hero cults. Occult practices. Readings in English translation, color slides. *(Lec. 3)* Staff (A) (F)

396 Mythology of the Romans *(I and II, 3)* Ancient Roman gods and cults. Native Greek and oriental myths and native historical legend in Roman epic, lyric, drama, prose, syncretism, occultism, astrology. Readings in English translation, color slides. *(Lec. 3)* Staff (A) (F)

397 Greek Mythology and Tragedy *(I or II, 3)* Relationship between Greek myth and classical tragedy, Attic and/or Roman. Employment of the same myth for different dramatic purposes. Mythological evolution through tragedy. Readings in English translation. Staff (F)

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. *Not open to students who are currently taking or who have taken SPE 101 or WRT 101.* Schwegler, Martin, Brownell (Cw) (C)

Communications

Communication Skills
101 College Communication Skills

Journalism
212 News Writing and Reporting
312 Intermediate Reporting
324 Magazine Article and Feature Writing

Speech Communications
101 Fundamentals of Oral Communication
103 Interpersonal Communication
215 Argumentation and Debate
220 Group Discussion
302 Advanced Public Speaking

Writing
002 Writing Lab
101A Composition
101B Composition
112 English as a Second Language I
122 English as a Second Language II
123 College Writing for Returning Students
201 Intermediate Writing
227 Business Communications
301. Advanced Writing
333 Scientific and Technical Writing

Communicative Disorders (CMD)

Chairperson: Associate Professor Singer

260 Speech Development and Correction *(II, 3)* Normal development of human speech, causes of speech and hearing disorders, and techniques of speech and hearing rehabilitation. For those in teaching, nursing, guidance, psychology, and education of the physically handicapped and mentally retarded. *(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. Observations and practice in the Rhode Island Hospital Hearing and Speech Center. *(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 and permission of department.* 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.* Beaupre and Staff

374 Communication Processes *(I, 3)* Psychocommunication processes basic to speech; theories of language learning; psychology of hearing and deafness; interrelationships between speech and personality. *(Lec. 3) Pre: junior standing.* Beaupre

375 Language Development *(I, 3)* Development phenomena in speech and language; causal factors of delayed speech and language; survey of evaluative and habilitative 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: 372 and 6 credits in natural sciences.* 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. *Pre: admission to departmental honors program.* 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) Pre: 260 and 261; and three of the following: 372, 373, 374, 375, 376. Not for graduate program credit.* Staff

475 Gestural Communication *(II, 2)* Visual systems such Ameslan, with emphasis on the cheirology and syntax of signing, vocabulary, and levels of language among deaf communicators. Finger spelling and sign language for educational, rehabilitative, and artistic goals studied. *(Lec. 1, Lab. 2) Pre: junior standing or graduate standing. Not for graduate program credit in Communicative Disorders.* Beaupre

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. Staff

504 Speech and Hearing Research *(II, 3)*
506 Speech and Hearing Science *(I, 3)*
551 Measurement of Hearing *(I, 3)*
552 Advanced Measurement of Hearing *(II, 3)*
553 Pediatric Audiology *(I, 3)*
554 Rehabilitative Audiology *(I, 3)*
555 Amplification for the Hearing Impaired *(II, 3)*
556 Electrophysiological Measures in Audiology *(II, 3)*
560 Disorders of Phonation *(II, 3)*
561 Articulation Disorders *(I, 3)*
564 Language Disorders in School-Aged Children *(II, 3)*
567 Clinical Practicum in Speech Pathology *(I and II, 1-3)*
568 Clinical Practicum in Audiology *(I and II, 1-3)*
569 Diagnostic Procedures *(I, 3)*
570 Clinical Practicum in Communicative Disorders *(I, II, 1-5)*
572 Medical Audiology *(I, 3)*
573 Contemporary Problems in Audiology *(II, 3)*
574 Environmental Audiology *(II, 3)*
577 Speech and Language for Hearing Impaired *(II, 3)*
580 Augmentative Communication *(II, 3)*
581 Cerebral Palsy *(I, 3)*
584 Language Disorders in Developmentally Young Children *(I, 3)*
585 Aphasia and Allied Language Disorders *(II, 3)*
586 Alaryngeal Speech *(I, 3)*
591 Contemporary Issues in Speech and Language Pathology *(II, 3)*
592 Stuttering and Cluttering *(I, 3)*

Community Planning (CPL)

Director: Associate Professor Foster

410 Fundamentals of Urban Planning *(I or II, 3)* Survey of urban planning principles, methods, and techniques pertinent to contemporary urban problems. History of city forms and functions and development of urban planning as a profession. Problems and priorities in shaping the future urban environment. *(Lec. 3) Primarily for students not enrolled in the graduate curriculum in community planning and area development.* Kupa

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.* Schatz

501 Introduction to Community Planning, History and Theory *(I, 3)*
510 Community Planning and Political and Social Change *(II, 3)*
511 Planning and Natural Environmental Systems *(I, 3)*
512 Spatial and Fiscal Relationships of Communities *(I, 3)*
516 (or MAF 516) Seminar on the Urban Waterfront *(I, 3)*
522 Planning Law *(I, 3)*
523 Planning Theory *(I, 3)*
525 Introduction to Planning Methods *(I, 3)*
526 Planning and Policy Analysis *(II, 3)*
530 Urban Design and Public Policy *(I, 3)*
535 Human Resources Planning *(I, 3)*
536 International Comparisons in Community Planning *(II, 3)*
537 (or REN 532) Land Resources Economics *(I, 3)*
538 Site Planning *(I, 3)*
539 Environmental Law *(II, 3)*
541 Urban and Rural Housing Policy *(I, 3)*
543 Social Indicator Analysis in Planning *(I, 3)*
545 Land Development Seminar *(II, 3)*
546 (or CVE 546) Urban and Rural Transportation *(I, 3)*
547 Planning Behavior and Organizations *(II, 3)*
549 Seminar in Ecological Planning *(II, 3)*
591, 592 Special Problems in Planning *(I or II, 1-6 each)*
593–598 Special Problems in Planning *(I or II, 1-6 each)*

Comparative Literature Studies (CLS)

Coordinator: Associate Professor Dvorak

135 (or PHL 135) Modern Thought: Philosophy and Literature *(I or II, 3)* Introduction to recent thought in philosophy and in literature. Emphasis on Kierkegaard, Marx, Nietzche, Freud, Sartre, and complementary literary texts. *(Lec. 3) Team-taught.* Kuhn and Johnson

160 Masterpieces of Literature
See English 160.

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 the topic changes. May be taken once for general education credit.* Staff (A)

335 (or ENG 335 or SOC 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 the topic changes.* Staff (A)

350 (or ENG 350) Literary Theory and Criticism *(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 the topic changes.* Murphy (Eng.)

450 Studies in Comparative Literature *(I or II, 3)* Detailed study of literary movement, genre, or an aspect of literature as seen in two or more literatures. *(Lec. 3) May be repeated for credit as often as the topic changes. Pre: 6 credits in literature or permission of instructor.*

510 Introduction to Comparative Literature *(I or II, 3)*

520 Literary Theory and Criticism *(I and II, 3)*
530 Approaches in Comparative Literature *(I or II, 3)*
597 Special Problems *(I and II, 1-6)*

Computer Science (CSC)

Chairperson: Associate Professor Lamagna

201, 202 Introduction to Computing I, II *(I and II, 3 each)* Algorithm development, programming and program structure, data representation, data structures, organization and characteristics of computers. Students will be expected to solve several numerical and non-numerical problems using one or more programming languages. *(Lec. 3) Pre: MTH 109 or equivalent for 201; 201 and MTH 141 for 202.* Staff. (M) for 201

301 Comparative Programming Languages *(I and II, 3)* Organization of programming languages including data and control structures, syntax, and semantics. Block structured languages, recursion, parameter passing mechanisms. Run-time considerations, operating environments, interpretive languages. Programming exercises in several representative languages. *(Lec. 3) Pre: 202.* Staff

302 Compiler Design *(I or II, 3)* Grammars and languages, lexical analysis, syntactic analysis, internal forms, symbol tables, run time storage administration. *(Lec. 3) Pre: 301 and 340.* Staff

311 Machine and Assembly Language Programming *(I and II, 3)* Introduction to the principles of machine and assembly language programming. Instruction definitions and internal machine representation of information for a particular computer. Computer solution of several numerical and non-numerical problems. *(Lec. 3) Pre: 202.* Staff

320 Computers in Society *(I or II, 3)* History, application, and social significance of computers. Emphasis on the role of the computer in society with respect to political, economic, cultural, social, and ethical aspects: its capabilities, potentials, and dangers. *(Lec. 3) Pre: 202, junior standing or permission of instructor.* Staff

340 Foundations of Computational Analysis *(I or II, 3)* Combinatorial techniques used in non-numerical computation and analysis of algorithms. Topics include enumeration, recurrence relations, graphs and networks. Complexity analysis of several representative problems and algorithms for their solutions. *(Lec. 3) Pre: 202 and prior credit or concurrent registration in MTH 215.* Staff

350 Introduction to Numerical Computation *(I or II, 3)* Finite precision and floating point arithmetic, pitfalls in computation, recursive and iterative processes, halving and doubling algorithms, built-in functions, computational techniques. *(Lec. 3) Pre: 202, MTH 215, 243.* Staff

406 Microcomputer Applications Laboratory *(I or II, 3)* Practical experience with microcomputer systems including high-level languages, disk operating systems, utilities. Typical microcomputer applications including color graphics and animation, digitization, plotting, speech recognition and synthesis, computer-aided instruction, telecommunications, music synthesis. *(Lec. 2, Lab. 2) Pre: 202 or 301.* Staff

411 Computer Organization and Programming *(I or II, 3)* Logical structure of computer systems. Assemblers, macro and conditional assembly, linkage and loading. Instruction sets, addressing techniques, processor organization and microprogramming. Operating system concepts including input-output and virtual memory. *(Lec. 3) Pre: 311.* Staff

412 Operating Systems *(I or II, 3)* Fundamentals of operating systems, file systems, CPU scheduling, memory management, disk scheduling, deadlocks, protection and concurrent processes. *(Lec. 3) Pre: 311.* Staff

416 Microcomputer Systems Architecture *(I or II, 3)* Recent developments in microprocessor technology. Processor organization, memory addressing modes, instruction sets. Input-output organization, mass storage, disk operating systems, telecommunications, distributed networks. Machine and assembly language programming. *(Lec. 2, Lab. 2) Pre: 311.* Staff

431 Data Structures *(I or II, 3)* Implementation and manipulation of lists, trees, graphs, arrays, and other data structures. Searching and sorting methods. File structures and data management. Data structures in programming languages. *(Lec. 3) Pre: 340 and credit or concurrent registration in MTH 215.* Staff

447 Discrete Mathematical Structures See Mathematics 447.

491 Directed Study in Computer Science *(I and II, 1-3)* Advanced work in computer science. Conducted as supervised individual projects. *Pre: permission of department. S/U credit.* Staff

492 Special Topics in Computer Science *(I or II, 3)* Advanced topics of current interest in computer science. *(Lec. 3) Pre: permission of department.* Staff.

501 Programming Language Semantics *(I or II, 3)*
502 Theory of Compilers *(I or II, 3)*
511 Advanced Computer Organization *(I or II, 3)*
512 Topics in Operating Systems *(I or II, 3)*
520 Software Engineering *(I or II, 3)*
525 (or IME 525) Simulation *(I or II, 3)*
536 Database Management Systems *(I or II, 3)*
540 Analysis of Algorithms *(I or II, 3)*
545 Formal Languages and Automata Theory *(I or II, 3)*
547 (or MTH 547) Combinatorics and Graph Theory *(I, 3)*
548 (or MTH 548) Topics in Combinatorics *(II, 3)*
550 Advanced Numerical Computation I *(I or II, 3)*
551 Advanced Numerical Computation II *(I or II, 3)*
581 (or ELE 581) Artificial Intelligence *(I or II, 3)*
582 (or ELE 582) Robotics *(I or II, 3)*
583 (or ELE 583) Computer Vision *(I, 3)*
591 Directed Study in Computer Science *(I and II, 1-3)*
592 Special Topics in Computer Science *(I or II, 3)*

Consumer Studies (CNS)

Program head: Assistant Professor Christner

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 department.* Noring

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 which affect, protect, and enhance financial security. *(Lec. 3) Pre: junior standing.* Christner and Anderson

340 Family Housing *(I, 3)* Evaluation and study of types of housing in relation to the family and community. Emphasis on socio-economic factors, housing laws, and aesthetic qualities concerned with housing. *(Lec. 3)* Noring

342 Housing for the Elderly *(II, 3)* Aspects of housing and near environmental conditions and needs, alternatives, legislative programs and support services related to housing for the elderly. *(Lec. 3) Pre: HCF 220 or permission of instructor.* Noring

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)* Noring

371 Seminar in Home Management *(II, 3)* Application and analysis of concepts of management in group living situations and assessment of community resources as they relate to use by individuals/families in resolving managerial problems. *(Lec. 3) Pre: 210, HCF 330 or SOC 212.* Noring

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 HCF 330 or permission of instructor.* Christner

420 Consumer Protection *(I and II, 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.* Christner

422 Consumer Issues Research *(I and 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.* Christner and Anderson

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 and 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 interest of students. *(Lab. TBA)* Staff

477, 478 Field Experience in Consumer Affairs *(I and II, 3 each)* Approved, supervised work experience related to consumer well-being. Examples include research, advocacy, education, and dissemination of information, or provision of service. *Pre: junior standing and permission of instructor. S/U credit. Not for graduate credit.* Staff

570 Special Problems *(I and II, 3)*

Dental Hygiene (DHY)

Chairperson: Professor B. Wilson

101 Pre-Clinical 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)* Wilson

125 Dental Morphology, Head and Neck Anatomy *(I, 3)* 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. 4, Lab. 2)* Bliss, Brown

126 General and Oral Histology and Embryology *(II, 3)* Cytology, development and microscopic anatomy of oral cavity. *(Lec. 2, Lab. 2) Pre: 125.* Bhattacharya

128 Periodontics *(II, 1)* Classification of periodontal disease, clinical picture, causative factors, and types of treatment. *(Lec. 2)* Ross

135 Technique-Clinical Dental Hygiene I *(I, 1)* 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. *(Practicum 6, Lec. 1) Pre: permission of department chairperson.* Staff

136 Clinical Dental Hygiene II *(II, 2)* Development of clinical skills. Application of the basic principles of oral inspection, charting, radiology, fluoride application and dental health education. *(Practicum 14* Lec. 1)* Staff

141 Dental Assisting *(I, 1)* Lectures, clinical observations, and practice devoted to methods of assisting dentists. *(Practicum 4)* 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)* 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)* Wilson and Staff

237 Clinical Dental Hygiene III *(I, 2)* Continuation of 136. *(Practicum 20*)* Staff

238 Clinical Dental Hygiene IV *(II, 2)* Continuation of 237. *(Practicum 20*)* Staff

244 Dental Materials and Operative Technique *(II, 1)* 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. — Practicum 3 for 8 weeks)* Coletti

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 practice and in the specialty areas. *(Lec. 2) For dental hygiene majors only.* Staff

250 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)* Wilson

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 majors only.* Wilson

462 Oral Care of the Aging and/or Chronically Ill *(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. Field Study 3) Pre:* ZOO *242 and HCF 220 or permission of instructor. In alternative years. Next offered fall 1989.* 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 as a job description and learning contract or letter of intent arranged by the instructor with the student and the agency supervisor. *Pre: 252 or permission of instructor.* Brown

Earth Science

See courses offered by the Department of Geology.

Economics (ECN)

Acting Chairperson: Professor Rayack

125, 126 Economic Principles *(I and II, 3 each)* Principles underlying the organization and functioning of the economic system. Description and analysis of institutions and market forces affecting the production and distribution of goods and services, business fluctuations, and international trade. *(Lec. 3) Pre: for 126, 125 or permission of department.* Staff (S)

300 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: 125, or permission of instructor.* Rayack (S)

*Rotating

301 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 non-union conditions. *(Lec. 3) Pre: 125, 126.* Lardaro

302 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: 126 or permission of department.* Ramstad

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. *Pre: 125, 126; MTH 141, 142, 215.* Staff

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. *Pre: 125, 126; MTH 141, 142, 215.* Staff

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: 125 or 126 or 590 or permission of instructor.* Staff

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: 126 or permission of instructor.* Staff

334 Money and Banking *(I or 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: 126 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: 125 or 126 or permission of instructor.* Hellman

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: 125 or permission of instructor.* Burkett

342 Public Finance *(I or 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: 125 or 126, or permission of instructor.* Lardaro

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. *(Lec. 3) Pre: 125 or 126 or permission of instructor. S/U credit.* Starkey

361 A Survey of Economic Thought *(I and II, 3)* Economic thought from Middle Ages to present; characteristics of classical, neoclassical and contemporary doctrinal developments. *(Lec. 3) Pre: 125 or 126 or permission of instructor.* Ramstad (S)

363 Economic Growth and Development *(I or II, 3)* Basic problems in economic growth and development of so-called backward or pre-industrial countries. Emphasis on population trends, agrarian reforms, capital formation, international aid programs, respective roles of private and public enterprise. *(Lec. 3) Pre: 125 or 126 or permission of instructor.* Suzawa

374 Introduction to Quantitative Methods in Economics *(I and II, 3)* Survey of the basic quantitative tools used by economists; mathematics, statistics and computer software. *(Lec. 3) Pre: 125, 126.* Mead

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. 2, Lab. 2) Pre: 125, 126 and MTH 141, or permission of instructor.* Miller

376 Introduction to Econometrics *(I or II, 4)* Application of econometric methods to economic problems. Econometric tools applied to micro- and macro-economic problems. *(Lec. 3, Lab. 2) Pre: 126 or permission of instructor.* Lardaro

401 Poverty in the United States *(I or II, 3)* Economic analysis of the determinants and distribution of poverty in the U.S. Evaluation of social welfare programs and various other proposals for the elimination of poverty. *(Lec. 3) Pre: 125 or 126, or permission of instructor.* Starkey

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: 125 or 126, or permission of instructor.* Mead

403 Theory and Topics in the Economics of Crime *(I or II, 3)* Application of economic analysis to various aspects of criminal activity. Consideration of economic determinants of income-generating crime, economic behavior of participants and cost to society. *(Lec. 3)* Barnett

404 Political Economy of Class, Race, and Gender *(I or II, 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. *Pre: 126 or permission of instructor.* Starkey

444 Applied Research in Economics *(II, 3)* The application of economic theory, econometrics, and computing to specific problems. Emphasis on formulation of hypothesis in mathematical form, transformation into forms suitable for empirical testing, testing using the computer, report writing, and oral presentation. *Pre: 323, 324, 376.* Staff

464 Comparative Economic Systems *(I or II, 3)* Theory and evidence concerning the influence of economic systems (capitalism, planned socialism, and market socialism) on national economics performance (growth, development, efficiency, equity, stability) and international economic relations (trade and finance). *(Lec. 3) Pre: 125 or 126 or permission of instructor.* Burkett

512 History of Economic Analysis *(II, 3)*
515, 516 Economic Research *(I and II, 1-3 each)*
526 (or LRS 526) Economics of Labor Markets *(I, II, SS, 3)*
527 Macroeconomic Theory *(I, 3)*
528 Microeconomic Theory *(I, 3)*
532 Industrial Organization and Public Policy *(II, 3)*
534 (or LRS 534) Information Sources and Uses in Labor Relations and Labor Economics *(I, II, SS, 3)*
538 International Economics *(I or II, 3)*
543 Public Finance and Fiscal Policy *(I and II, 3)*
552 Monetary Theory and Policy *(II, 3)*
566 Economic Planning and Public Policy in Developing Nations *(II, 3)*
575 Introduction to Mathematical Economics *(I, 3)*
576 Econometrics *(II, 4)*
590 Principles of Economics *(I and II, 3)*
595 Problems of Modernization in Developing Nations *(II, 3)*

Education (EDC)

Acting Chairperson: Associate Professor Nelson

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 socio-cultural phenomenon and an embodiment of philosophical commitments. *(Lec. 3)* Staff (S)

250 Supervised Pre-Professional 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. May be repeated once for credit. *Pre: Permission of department.* 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/short-term goals. 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 which are 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.

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 or 313.* Staff

401 Development and Utilization of Instructional Materials *(I and II, 3)* Methods of developing and making classroom application of selected materials: non-projected, 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 six 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 HCF 200; EDC 312.* Staff

403 History of Education *(I, 3)* Study of main currents of educational thought in historical perspective; relevance of educational movements and practices of the past to the contemporary school. *(Lec. 3) Pre: junior standing.* Staff

407 Philosophy of Education *(I and II, 3)* Examines influence of philosophical ideas upon education. Questions on reality, knowledge, and value examined from different views to analyze controversial issues in theory and practice. *(Lec. 3) Pre: junior standing.* Russo

410 Seminar and Supervised Field Practicum in Education of the Aging *(I and II, 3)* Adult educational methods as applied to older adults, including pre-retirement education, current education programs for the elderly, and evaluation of educational acitivities with the aging. Supervised field practicum of 150 hours. *(Lec. 2, Lab. 3) Pre: 581 or permission of department.* Staff

424 Teaching of Reading *(I and II, 3)* Philosophy, materials and methods underlying the teaching of reading with special emphasis upon developing understanding. *(Lec. 3) Pre: 313 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 upon 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 grade pre-one, one, and two. *(Lec. 3) Pre: HCF 301. Open only to students in Elementary Education: Early Childhood option. Not for graduate degree program credit.* Trostle

427 Methods and Materials in Elementary Teaching I *(I and II, 3)* Language arts/reading principles and practices of guiding children in skilllful use of basic means of communication (speaking, listening, writing, and reading). *(Lec. 3) Pre: PSY 113 and 232, EDC 313, concurrent registration in EDC 428, permission of department. Open only to students in elementary education curriculum. Not for graduate degree program credit.* O'Neill and Kelly

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 children. *(Lec. 3) Pre: PSY 113 and 232, EDC 313, concurrent registration in EDC 427, permission of department. Open only to students in the elementary education curriculum. Not for graduate degree program credit.* O'Neill and Kelly

429 Reading Readiness *(I and II, 1)* History and foundations of reading readiness and contemporary practical applications of readiness activities and language experience projects. Addresses the young child from birth to five years. *(Lec. 1) Pre: Prior or concurrent registration in 424. Not for graduate program credit.* Trostle

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. *(Lec. 3) Pre: 102 and 313. PSY 232, senior standing, and permission of instructor. Open only to students admitted into the secondary education curriculum. Sectioned by academic major: business, English, mathematics, modern language, science, social studies. Sem. II: Business Administration students only. Not for graduate degree program credit.* Staff

435 The Teaching of Composition
See Writing 435.

441 Methods and Materials of Teaching Business Subjects *(I, 4)* Current trends in teaching office occupations and social business subjects. *(Lec. 4) Not for graduate degree program credit.* Staff

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: 103 and 313. Not for graduate degree program credit.* 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 the department.* Bumpus

450 Introduction to Counseling
See Human Development, Counseling and Family Studies 450.

451 Death, Dying and Bereavement
See Human Development, Counseling and Family Studies 421.

478, 479 Problems in Education *(I and II, 0-3 each)* Advanced work in education, conducted as seminars or as supervised individual projects. *(Lec. or Lab.) Pre: permission of department.* Staff

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 non-vocational, S/U credit; elementary education, S/U credit; home economics, S/U credit; resource development; business; music; theatre. *Pre: methods course(s) of department involved. Not for graduate degree program credit.* 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 non-vocational, elementary education, home economics, resource development, business, music, physical education (S/U only), theatre. *(Lec. 3) Pre: concurrently with 484, permission of department. Not for graduate degree program credit.* Staff

486 Student Teaching in Elementary Physical Education *(I and II, 6)* Under select-

ed and approved critic teachers, students participate in classroom teaching and other school activities. *Pre: methods courses in the department. Not for graduate degree program credit.* 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)*
501 **Comparative Education in International Perspective** *(I or II, 3)*
502 **The Modern Curriculum Movement** *(I, 3)*
503 **Education in Contemporary Society** *(II, 3)*
504 **Adult Basic Education** *(I and II, 3)*
505 **Leadership Development in Adult Programs** *(I or II, 3)*
509 **Critique of Public Policy in Human Services and Education** *(I and II, 3)*
514 **Current Trends in Elementary Education** *(I, 3)*
515 **Discipline and Youth in Schools** *(I and II, 3)*
516 **Teaching English as a Second Language to Adults** *(II, 3)*
518 **Teaching Science in the Elementary School** *(I or II, 3)*
520 **Teaching of Arithmetic** *(I, 3)*
521 **Teaching Basic Reading to Adults** *(I or II, 3)*
522 **Microcomputer Applications in the Classroom** *(I and II, 3)*
528 **Teaching Language Arts** *(II, 3)*
529 **Foundations of Educational Research** *(I and II, 3)*
530 **Qualitative Evaluation** *(I or II, 3)*
531 **School-Home Relations** *(I or II, 3)*
534 **Mathematics in the Secondary School** *(II, 3)*
535 **Classroom Observation and Evaluation** *(I or II, 3)*
538 **Teaching the Gifted and Talented** *(I or II, 3)*
539 **Evaluation and Monitoring of Occupational Training Programs** *(I or II, 3)*
540 **(or PSY 540) Learning Disabilities: Assessment and Intervention** *(SS, 3)*
542 **Methods for Challenging the Gifted Reader** *(I and II, 3)*
548 **Applications of Reading in the Content Areas** *(II, 3)*
561 **Analysis of Reading Disabilities** *(I, 3)*
562 **Techniques in Remedial Reading** *(II, 3)*
563 **Teaching Reading to Multicultural Populations** *(I, 3)*
565 **Analysis and Evaluation of Current Research in Reading** *(I, 3)*
566, 567 **Practicum in Reading** *(I and II, 3 each)*
569 **Middle School Curriculum** *(SS, 3)*
570 **Elementary School Curriculum** *(II, 3)*
571 **The Secondary School Curriculum** *(II, 3)*
572 **Cooperative Supervision** *(I and II, 3)*
574 **Current Trends in Secondary Education** *(I and II, 3)*
575, 576 **Supervised Field Study and Seminar in Elementary or Secondary Education** *(I and II, 3 each)*
577 **Organization and Administration in Elementary School** *(I, 3)*
579 **(or LRS 579) Labor Relations and Collective Bargaining in Education** *(I or II, 3)*
580 **Organizing and Administering Youth Programs** *(I or II, 3)*
581 **Administering Adult Programs** *(I or II, 3)*
582 **Instructional Systems Development for Adult Programs** *(I, 3)*
583 **Planning Design and Development of Adult Learning Systems** *(I, 3)*
584 **The Adult and the Learning Process** *(I and II, 3)*
586, 587 **Problems in Education** *(I and II, 0-3 each)*
588, 589 **Supervised Field Practicum and Seminar in Youth and Adult Education** *(I and II, 3 each)*
594 **Organization and Supervision of Reading Programs** *(II, 3)*
596 **(or HCF 562) Organization Development in Education** *(II, 3)*

Electrical Engineering (ELE)

Chairperson: Professor Lindgren

Admission to all 200-level courses in electrical engineering is limited to students formally transferred to the College of Engineering. Exceptions are possible, with permission of the ELE department, for advanced students in other disciplines.

205 Microprocessor Laboratory *(I, 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: permission of instructor and MTH 141 which may be taken concurrently.* 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 vs. distributed parameters; electric circuit concepts, principles, and theorems. *(Lec. 3) Pre: MTH 142 and PHY 213.* Staff

211 Linear Systems and Circuit Theory I *(I, 3)* Application of Kirchoff's laws and mathematical models for circuit elements to predict responses of electrical circuits to input signals and to initial condition. Complexity is limited to first and second order differential equations. *(Lec. 3) Pre: MTH 142 or PHY 214.* Staff

212 Linear Systems and Circuit Theory II *(II, 3)* Continuation of 211 including analysis of more complicated circuits by mesh and node methods, phasor methods for the sinusoidal steady state, and Laplace transform techniques. *(Lec. 3) Pre: 211.* Staff

214 Circuits Laboratory I *(I, 1)* DC measurements, resistive circuits, the oscilloscope, time constants of first order circuits, operational amplifiers, natural response of second order circuits, combinational digital logic circuits. (Lab. 3) *Pre: 211, which may be taken concurrently.* Staff

215 Circuits Laboratory II *(II, 1)* AC measurements, impulse and frequency response of linear circuits, resonance, operational amplifier circuits, simulation of transfer functions, filters. *(Lab. 3) Pre: 214 and 212 which may be taken concurrently.* 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) Not for students majoring in electrical engineering. Pre: PHY 214 or ELE 210.* 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) Not for students majoring in electrical engineering. Pre: 220.* Staff

Prerequisites for all 300-level courses in electrical engineering include mathematics through MTH 243, ELE 210 or PHY 214, ELE 211, 212, 214 and 215; additional prerequisites are indicated with each course. Exceptions are possible, with permission of the ELE department, for advanced students in other disciplines.

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. 3) Pre: 212.* Staff

314 Linear Systems and Signals *(II, 3)* Continuous-time and discrete-time systems, state-space methods and relationship to frequency response; stability criteria; time sampling and Z-transforms, fast Fourier transform, digital filtering; applications to communication, control, signal processing. *(Lec. 3) Pre: 313.* Staff

322 Electromagnetic Fields I *(I, 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 ELE 210.* Staff

323 Electromagnetic Fields II *(II, 3)* Magnetostatics continued. Introduction to electrodynamics. Maxwell's equations, wave equation, plane wave propagation, reflection and refraction phenomena. *(Lec. 3) Pre: 322.* 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 341 or equivalent.* Staff

342 Electronics I *(II, 4)* Introduction to diode, transistor, FET and vacuum tube circuits, equivalent circuits, amplification, stability, small and large signal behavior. *(Lec. 3, Lab. 3) Pre: 212 and 214.* 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 preparation for graduate work. *Pre: junior standing and permission of department.* Staff

Prerequisites for all 400-, 500-, and 600-level electrical engineering courses: mathematics through calculus (MTH 243) and at least 6 credits in circuit theory and 3 credits in electromagnetic fields. Additional prerequisites as indicated with each course. Some circuits and fields prerequisites may be waived for 481, 482, 545, 588, and 589 for students with suitable backgrounds.

401 Lasers, Optical Systems and Communications *(I, 4)* Laser fundamentals and light amplification. Diffraction and Fourier optical transformations with applications to engineering. Optical signal processing, holography and applications. Optical systems and communication. *(Lec. 3, Lab. 3) Pre: 323 or equivalent.* Staff

405 Digital Computer Design *(II, 3)* Hardware implementation of digital computers. Arithmetic circuits, memory types and uses, control logic, basic computer organization, microprogramming, input/output circuits, microcomputers. *(Lec. 3) Pre: 205 or CSC 311.* Staff

408 Computer Organization Laboratory *(II, 3)* Experiments with minicomputers and microprocessors. Operation of arithmetic units, data paths, control units, I/O memory and microprogramming. *(Lec. 1, Lab 5) Pre: 405 or CSC 311.* Staff

427 Electromechanical Devices *(I, 4)* Principles of electromechanical energy conversion. Development of models for state response, natural response and stability, signal flow graphs, convolution integral, and sensors. *(Lec. 3, Lab. 3) Pre: 313, 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. 3, Lab. 3) Pre: 331 or equivalent.* Staff

436 Communication Systems *(I, 3)* Representation of signals and noise. Basic principles of modulation and demodulation. Waveform and digital transmission systems. *(Lec. 3) Pre: 313 and 314 or equivalent knowledge of linear circuit theory, elementary electronics and transform methods.* Staff

437 Computer Communications *(II, 3)* Digital communication, error detection, recovery, graph theory in network topology, queuing theory, delay-thruput tradeoffs in networks, multiple-access channels, wide/local area networks, carrier-sense multiple access, collision detection. *(Lec. 3) Pre: 436 or equivalent level of knowledge in probability and linear transform analysis and permission of instructor.* Kumaresan

443 Electronics II *(I, 5)* Continuation of 342. Application of signal flowgraphs as an aid to design. Thermal stability of stages. Applications of circuit analysis program, SPICE. Design of multiple transistor circuits. Feedback. *(Lec. 3, Lab. 5) Pre: 342.* Staff

444 Electronics III, Pulse and Digital Circuits *(II, 4)* Extension of the fundamental ideas of 342 and 443 to the analysis and design of pulse forming and switching circuits. Piece-wise linear approach to the nonlinear behavior of electronic devices. *(Lec. 3, Lab. 3) Pre: 443.* 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 *(II, 3)* Analytical, experimental, and computer simulation studies of typical control, communication, and biosystems problems. *(Lec. 2, Lab. 3) Pre: 457.* Staff

481, 482 Biomedical Engineering Seminar I and II *(I and II, 1 each)* Selected topics in biomedical engineering research from current scientific literature. Presented by students and invited staff. *Pre: permission of department. 481 not prerequisite for 482.* Ohley

491, 492, 493 Special Problems *(I and II, 1 each)* Special engineering problems assigned to student according to his or her interests and capabilities. *(Lec. or Lab.) 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. *Pre: permission of department and completion of the junior year in electrical engineering. Not for graduate degree credit.* Staff

496 Electrical Engineering Practice II *(II, 6)* Industrial experience in electrical engineering at companies or government laboratories selected by department. Student works on a major design or other engineering project under supervision of engineers from industry and URI faculty. *Pre: 495 and permission of department. Not for graduate degree credit.* Staff

501 Linear Transform Analysis *(I, 3)*
502 Nonlinear System Analysis *(I or II, 3)*
503 (or MCE 503) Linear Control Systems *(I or II, 3)*
504 (or MCE 504) Optimal Control Theory *(II, 3)*
506 Digital Signal Processing *(II, 3)*
509 Systems with Random Inputs *(I or II, 3)*
510 Communication Theory *(II, 3)*
511 Electromagnetic Fields *(I, 3)*
513 Solar to Electric Energy Conversion *(II, 3)*
514 Microwave Electronics *(I or II, 3)*
515 Quantum Electronics *(I or II, 3)*
520 Fourier Optics *(I or II, 3)*
525 Fiber Optic Communication Systems *(II, 3)*
531 Solid State Engineering I *(I and II, 3)*
532 Solid State Engineering II *(I and II, 3)*
535 Transistor Circuits *(I and II, 3)*
536 Semiconductor Electronics *(I or II, 3)*
537 VLSI System Design *(I or II, 3)*
538 Principles of Remote Sensing *(I or II, 3)*
539 Analog VLSI *(I or II, 3)*
544 Computer Arithmetic for VLSI *(II, 3)*
545 Design of Digital Circuits *(I, 3)*
546 Computer Based Instrumentation *(I, 3)*
548 Computer Architecture *(I and II, 3)*
571 (or OCE 571) Underwater Acoustics I *(I, 3)*
575 Electroacoustical Engineering *(I and II, 3)*
581 (or CSC 581) Artificial Intelligence *(I or II, 3)*
582 (or CSC 582) Robotics *(I or II, 3)*
583 (or CSC 583) Computer Vision *(I, 3)*
584 (or EST 584) Pattern Recognition *(II, 3)*
588 Biomedical Engineering I *(I, 3)*
589 Biomedical Engineering II *(I and II, 3)*
591, 592 Special Problems *(I and II, 1-3 each)*

Engineering (EGR)

102 Basic Graphics *(I, 1)* Theory of orthographic projection and principles of descriptive geometry, construction of exact drawings

of three-dimensional objects including auxiliary views, pictorial drawings, cross-sections and dimensioning, free-hand sketching. *(Lab. 3)* Staff

English (ENG)

Chairperson: Associate Professor Reaves

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

232 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 which molded a standard dialect. *(Lec. 3)* Staff (S)

241, 242 American Literature *(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 prerequisite 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 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, socio-political, and cultural ideas of black people. *(Lec. 3)* Badejo (A)

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 Rennaissance and the Black Arts Movement of the 1960s and 1970s. *(Lec. 3)* Badejo (A)

251, 252 English Literature *(I and II, 3 each) 251:* Selections from English literature, beginnings to 1798. *252:* Selections from English literature, 1798 to the present. 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. *May not be repeated.* Staff

305 Advanced Creative Writing *(I and II, 3)* Provides further training for students especially talented in creative writing. Increased emphasis on independent projects in longer forms of prose and poetry. *(Lec. 3) Pre: 205 and permission of department.* 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)

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)* Tutt and Kunz

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 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) Offered every fourth fall. Next offered fall 1988.* Badejo

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, Elison, Margaret Walker, Morrison, Reed, Alice Walker, and Baldwin. *(Lec. 3) Offered every fourth fall. Next offered fall 1990.* Badejo

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. In alternate years. Next offered spring 1990.* Badejo

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 non-fiction prose of Burns, Blake, Wordsworth, Coleridge, Byron, Shelley, Keats, and others. *(Lec. 3)* Staff

377 Victorian Literature *(I and II, 3)* Poetry, non-fiction 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, non-fiction 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. *Pre: permission of department. Total cumulative hours permitted: 6.* Staff

397 The Literary Landscape of Britain *(SS, 3)* Taught in England, second summer session. Examines impact of English social and natural landscape on and their treatment in selected literary works. *Usually taught in conjunction with HIS 397. (Lec. 3)* 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) Pre: permission of instructor. In alternate years, next offered spring 1989.* Badejo

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 once. In alternate years, next offered spring 1990.* Badejo

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

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. *(Lec. 3) Open only to seniors majoring in English.* Staff

510 Bibliography and Literary Research *(II, 3)*
530 History of the English Language *(I, 3)*
531 History of Critical Theory *(II, 3)*
532 Modern Literary Criticism *(I, 3)*
534 Structure of the English Language *(I or II, 3)*
535 Old English *(I, 3)*
536 Problems in Linguistics and Literature *(II, 3)*
540 Modern American Novel *(I, 3)*
545 Problems in American Realism and Naturalism *(I, 3)*
546 Problems in American Romanticism *(II, 3)*
547 Early American Literature to 1800 *(I, 3)*
549 Modern American Poetry *(II, 3)*
550 Middle English Literature *(II, 3)*
551 The Metaphysical Poets *(I, 3)*
554 Modern British Poetry *(I, 3)*
555 Modern British Novel *(I, 3)*
556 English Literature of the Sixteenth Century *(I, 3)*
557 English Literature of the Seventeenth Century *(II, 3)*
558 English Literature of the Eighteenth Century *(I, 3)*
559 English Literature of the Romantic Period *(II, 3)*
560 English Literature of the Victorian Period *(II, 3)*
561 Modern European Novel *(II, 3)*
570 Anglo-Irish Writers *(II, 3)*
571 Problems in Chaucer *(I, 3)*
573 Problems in Shakespeare *(II, 3)*
574 The Scots' Poetic Tradition through Robert Burns *(II, 3)*
575 Modern Southern Literary Renaissance *(II, 3)*
576 English Novel of the Eighteenth Century *(I, 3)*
577 English Novel of the Nineteenth Century *(II, 3)*
578 Problems in Milton *(II, 3)*
590 Selected Topics *(I and II, 3)*

Environmental Health Science (EHS)

Chairperson: Professor Shimizu (Pharmacognosy and Environmental Health)

562 Interdisciplinary Seminar *(I, 3)*
563 Public Health Administration *(II, 3)*

Experimental Statistics (EST)

Chairperson: Associate Professor Lamagna

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. 3)* Staff (M)

407 Introductory Biostatistics *(I or 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. 3) Pre: MTH 109. Not open to students who have credit in 408, 409.* Staff

408 Statistical Methods in Research I *(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. 3) Pre: MTH 109. Not open to students who have credit in 407, 409.* Staff

409 Statistical Methods in Research I *(I and II, 3)* Same as 408, but for students who have better mathematical preparation. *(Lec. 3) Pre: MTH 142. Not open to students who have credit in 407, 408.* Staff

412 Statistical Methods in Research II *(I or 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: 407 or 408 or 409.* Staff

413 Data Analysis *(I or II, 3)* Exploring data from experimental trials, sample surveys, multivariate studies; weighing chances, detecting patterns, identifying outliers, finding models; elementary computational procedures. *(Lec. 3) Pre: 407 or 408 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, radomized 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.* Hanumara

491 Directed Study in Experimental Statistics *(I and II, 1-3)* Advanced work in experimental statistics. Conducted as supervised individual projects. *Pre: permission of department. S/U credit.* Staff

492 Special Topics in Experimental Statistics *(I or II, 3)* Advanced topics of current interest in experimental statistics. *(Lec. 3) Pre: permission of department.* Staff

500 Nonparametric Statistical Methods *(I or II, 3)*
501 Analysis of Variance and Variance Components *(I or II, 3)*
502 Applied Regression Analysis *(I or II, 3)*
517 (or PSY 517) Small N Designs *(I or II, 3)*
520 Fundamentals of Sampling and Applications *(I or II, 3)*
532 (or ASC, PSY 532) Experimental Design *(II, 3)*
541 Multivariate Statistical Methods *(I or II, 3)*
542 Discrete Multivariate Methods *(I or II, 3)*
550 Ecological Statistics *(I or II, 3)*
576 (or ECN, REN 576) Econometrics *(I, or II, 3)*
584 (or ELE 584) Pattern Recognition *(I or II, 3)*
591 Directed Study in Experimental Statistics *(I and II, 1-3)*
592 Special Topics in Experimental Statistics *(I or II, 3)*

Film Studies

Coordinator: Professor Keller

Art
374 Topics in Film and Photography

English
300 Literature into Film
346 American Film Classics

History
358 Recent America in Film

Italian
315 Italian Cinema

Finance (FIN)

Chairperson: Associate Professor Dash (Finance and Insurance)

301 Financial Management *(I and II, 3)* An analysis of the investment and financing issues facing large and small corporate and noncorporate business. Emphasis is on financial planning and decision-making. *(Lec. 3) Pre: ECN 126, ACC 202, and MGS 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. *(Lec. 3) Pre: 301 or concurrent with 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 126, ACC 202, and MGS 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 126.* Staff

401 Advanced Financial Management *(I or II, 3)* Intensive research on selected current topics relating to the financial management of the firm. *(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

431 Advanced Financial Institutions and Capital Markets *(I or II, 3)* Intensive research on selected current topics relating to financial institutions and markets. *(Lec. 3) Pre: 301, 331 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

442 Real Estate Finance *(I or II, 3)* The methods and instruments used to finance real estate; the terms and sources of funds; investment opportunities and risk analysis in real estate. *(Lec. 3) Pre: 301 or permission of instructor. Not for graduate credit for students in the College of Business Administration.* 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

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.

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 FIN. Fifteen working days (or 120 hours). *Pre: junior standing and proposal approved by the College of Business Administration. May be repeated once for credit. Not for graduate credit. S/U only.* Staff

Fisheries and Marine Technology (FMT)

Chairperson: Professor Meade (Fisheries, Animal and Veterinary Science)

200 The Aquatic Environment and Fisheries *(I, 3)* The interrelationships between the freshwater and marine environments and the capture and culture fisheries. *(Lec. 3)* DeAlteris

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)* Stout

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)* Stout

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 shiphandling. Rigging and working gear used in fisheries and oceanography. *(Lec. 2, Lab. 3)* Wing

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: 200 and ZOO 111 or at least one semester of general zoology.* Recksiek

321 Fishing Gear Technology *(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: 200 or permission of instructor.* DeAlteris

331 Marlinspike Seamanship and Rigging Safety *(I, 3)* Layout and operation of commercial sea-going vessels with particular emphasis on rigging arrangements and advanced marlinspike seamanship. *(Lec. 2, Lab. 3) Pre: 231, MTH 111 and PHY 111 or permission of instructor.* Stout

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

380 Inshore and Coastwise Navigation *(I, 4)* Theory and practice of navigation for operators of vessels working up to 200 miles offshore. Chartwork, tides, currents, instruments, visual and electronic aids, graphical and mathematical dead reckoning. *(Lec. 3, Lab. 3) Pre: MTH 111 and PHY 111 or permission of instructor.* Stout

390 Fishing Operations *(I, 3)* Fishing operations procedures in navigation, electronics, vessel layout, rigging, and handling of various types of fishing gear. *(Lec. 2, Lab. 3) Pre: 290.* 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. *(Lec. and/or Lab. according to nature of project) Pre: permission of department.* 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 of permission of instructor.* Recksiek

421 Theory of Fishing Gear Design *(I, 3)* Detailed study of the design considerations and methods of construction of specific representative commercial and scientific sampling fishing gear. Full-scale and model nets are designed, constructed, and tested. *(Lec. 3) Pre: 321 or permission of instructor.* DeAlteris

431 Vessel Casualty Prevention *(II, 3)* International and Inland Rules of the Road. Radar procedures for avoiding collisions. Design, construction, and operation of vessels with emphasis on prevention of sinkings and capsizings. *(Lec. 3) Pre: MTH 111, PHY 111 or permission of instructor. Not for graduate credit.* Stout

452 Industrial Fishery Technology
See Animal Science 452.

480 Mid-Ocean Navigation *(I, 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 or permission of instructor. Not for graduate credit.* Stout

510 Marine Fisheries Ecology *(I, 3)*
516 Early Life History of Aquatic Resource Animals *(II, 3)*
518 Marine Fisheries Technology *(I, 3)*
521 Advanced Fishing Gear Technology *(II, 3)*
591, 592 Special Problems *(I and II, 1-3 each)*

Food Science and Nutrition (FSN)

Chairperson: Professor Rand

150 Food in Affluence and Poverty *(II, 3)* Relationships between food and current problems including the world food problem, hunger and malnutrition, food fads and misinformation, food processing and additives, food ecology, food and nutrition improvement programs. *(Lec. 3)* Eshleman (S)

201 Introduction to Food Study *(I, 3)* Basic principles of food selection in today's market and preparation to retain maximum nutritive values and palatability. *(Lec. 2, Lab. 3) Pre: CHM 124 or 227. Proficiency test available.* Staff

207 General Nutrition *(I and II, 3)* Fundamental concepts of the science of nutrition with application to world, community and personal aspects. *(Lec. 3) Proficiency test available.* Caldwell or Gerber (N)

237 Introductory Food Science *(I, 3)* Survey of basic principles of food science and technology. *(Lec. 3) Proficiency test available.* Rand

307 Nutrition and Aging *(I, 3)* Nutrition of the elderly as affected by metabolic and physiologic factors in aging. Study of the nutritional requirements and status of the elderly as well as the effectiveness of nutrition support systems. *(Lec. 3) Pre: 207 or HCF 220, BIO 102 or equivalent. In alternate years, next offered fall 1989.* Eshleman

308 Nutrition in Growth and Pregnancy *(I, 3)* Examines current issues in maternal and child nutrition as related to growth and physical development. Discusses specific nutrition-related problems including development of food habits, food consumption patterns, and nutrient requirements. *(Lec. 3) Pre: 207, BIO 102 or equivalent. In alternate years, next offered fall 1988.* Caldwell

309 Nutrition in Obesity and Weight Control *(II, 3)* Etiology of weight control exam-

ined, emphasis upon the physiological basis of energy balance. Abnormal eating behavior leading to obesity or undernutrition studied, and management protocol evaluated. Nutritionally adequate and effective reducing diets emphasized. *(Lec. 3) Pre: 207, BIO 102. In alternate years, next offered spring, 1990.* Staff

331 Advanced Food Study *(II, 3)* Food systems. Physical and chemical changes occurring in food during preparation, serving and storage. Laboratory application, including assessment of food quality. *(Lec. 2, Lab. 3) Pre: 201 or permission of instructor.* Staff

333 Quantity Food Production *(I and II, 3)* Application, analysis, and evaluation of producing, distributing, and serving quality food in quantity. Experience in a food service facility. *(Lec. 1, Lab. 4) Pre: 201, MIC 201 or 211, senior standing, or permission of department.* English

334 Quantity Food Purchasing and Cost Control *(II, 3)* Production, distribution, storage, cost analysis of food supplies to serve as basis for institutional purchasing by specification. Investigation and analysis of existing purchasing systems. *(Lec. 3) Pre: previous or concurrent registration in 333 and senior standing, or permission of department.* English

335 Food Service Management *(I, 3)* Administrative responsibilities in organizing, planning, analyzing, controlling, and evaluating. Technical operations of sub-units in relation to the whole in food service systems. *(Lec. 3) Pre: 201, 207 and junior standing, or permission of department.* English

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, CHM 124.* Simpson

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)* Cosgrove

386 Food Sanitation *(II, 3)* Principles of sanitation as applied to the food service 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

421 Food Analysis *(I, 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: BCP 311 and an advanced course in microbiology or permission of instructor. In alternate years, next offered spring 1990.* 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: BCP 311 or equivalent.* T. Lee

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. *Pre: 431 and MIC 211.* Rand

433 Food Quality *(II, 3)* Technological problems of procurement, manufacture, transportation, grading, packaging, and storage of food products. Field trips required. *(Lec. 2, Lab. 2) Pre: 431 and MIC 211.* Cosgrove

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 department.* C. Lee and T. Lee

438 Food Chemistry Laboratory *(I, 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 department.* Staff

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, ZOO 242, BCP 311 or permission of department.* 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 department.* Caldwell

447 Food Engineering I
See Chemical Engineering 447.

451, 452 Field Experience in Food Science and Nutrition *(I and II, 1-3 each)* Individual supervised field experiences and seminar in community, educational, government, health-oriented, or commercial activities and services related to food science and nutrition. *(Lec. and Lab.) Pre: permission of department. Maximum total of 6 credits. Not for graduate degree program credit.* Eshleman

456 Community Nutrition *(II, 4)* Assessment of the role of nutrition and food behavior in community health; study of current nutrition programs; development of an advocacy role in nutrition legislation; program planning, implementation, evaluation. *(Lec. 4) Pre: 441 and 444 or permission of instructor.* Eshleman

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 vs. benefits. Legal and regulatory aspects. *(Lec. 3) Pre: 431 or permission of instructor.* Dymsza and T. Lee

491, 492 Special Projects *(I and II, 1-3 each)* Advanced work under supervision of staff member. Arranged to suit individual requirements of student. *Pre: senior standing and permission of department.* Staff

502 Physical Chemistry and Properties of Food *(I, 3)*
503 Food Science and Nutrition Research Methods *(I, 4)*
505 Marine Foods Seminar *(I, 1)*
511, 512 Food Science and Nutrition Seminar *(I and II, 1 each)*
521 Pesticide Chemistry *(II, 3)*
523 (or MIC 523) Water Pollution Microbiology *(I, 3)*
525 (or MIC 525) Water Pollution Microbiology Laboratory *(I, 1)*
526 (or MCH 526) Lipid Chemistry *(I, 3)*
531 (or HED 531) Teaching of Nutrition *(I or II, 3)*
532 Seafood Quality *(II, 3)*
542 Minerals and Vitamins *(II, 3)*
545 Protein Nutrition *(II, 3)*
548 (or CHE 548) Separations for Biotechnology *(II, 3)*
549 (or CHE 549) Food and Biochemical Engineering III *(II, 3)*
550 Issues in International Nutrition *(I, 3)*
575 (or CHE 575) Biochemical Engineering II *(II, 3)*
591, 592 Special Research Problems *(I and II, 1-4 each)*

French (FRN)

Section Head: Professor Chartier

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.* Staff (F)

102 Beginning French II *(I and II, 3)* Continuation of 101. *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. *Pre: 103 or equivalent.* Staff (F)

113 Intensive French III *(I and II, 4)* Grammar review, further exercise in conversation and reading of easy texts. *(Lec. 4) Two or more years of high school French or permission of instructor. May not be taken concurrently with 103, 104.* 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 pre-college French or permission of section head. Not open to students who have passed 101 or 102. Not for major credit.* Staff (F)

205, 206 Conversation and Composition *(I and II, 3 each)* Comprehension of spoken French; speaking with ease and an acceptable accent on assigned topics; oral reports on articles read in newspapers and periodicals, and frequent written compositions. *(Lec. 3) Pre: 104 or equivalent.* Staff

208 Preparation for Study in France *(II, 3)* Emphasis on listening comprehension and oral expression through class discussion, visiting lecturers, and language laboratory. *Required of and restricted to students participating in Orleans Exchange Program. Pre: 205 or equivalent and permission of instructor. Not open to freshmen.* Hyland

301, 302 The Civilization of France *(I and II, 3 each)* Geographical, historical, economic, social and aesthetic factors contributing to the cultural development of France. *(Lec. 3) Pre: for 301, 206; for 302, 301 or permission of department. Recommended for French majors in the General Teacher Education curriculum.* Staff

305 Composition *(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: 206 or equivalent.* Porter

306 Oral Expression in French *(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: 206 or equivalent.* Staff

327 Survey of French Literature from the Middle Ages to 1789 *(I, 3)* Survey of major writers and literary movements of French literature from the Middle Ages to 1789. Introduction to poetry and drama as genres. *Explication de texte* and short papers. *Pre: 206 or permission of instructor.* Staff (A)

328 Survey of French Literature from 1789 to Present *(II, 3)* Survey of major writers and literary movements of French literature from 1789 to present times. Introduction to the novel as genre. *Explication de texte* and short papers. *Pre: 206 or permission of instructor.* Staff (A)

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) May not be taken for credit toward major requirements in French.* Kuhn (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) May not be taken for credit toward major requirements in French.* Kuhn (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) May not be taken for credit toward major requirements in French.* Kuhn (A) (F)

394 Literary Topics in Translation *(I or II, 3)* Selected topics in French literature in translation. *(Lec. 3) May not be taken for credit toward major requirements 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: 205 or permission of instructor.* Rogers

411 Medieval Literature *(I, 3)* Representative works of the late eleventh century through the fourteenth century. *(Lec. 3) Pre: 325 or 326 or permission of instructor.* Rogers

433 Seventeenth-Century Literature *(II, 3)* General survey of the writers of the period including Corneille, Molière, Racine, Pascal, and the Moralistes. *(Lec. 3) Pre: 325 or 326 or permission of instructor.* Morello

443 Eighteenth-Century Literature *(I, 3)* Principal literary movements as illustrated by Voltaire, Diderot, Rousseau, and other leading writers. *(Lec. 3) Pre: 325 or 326 or permission of instructor.* Rothschild

453 Nineteenth-Century Literature until 1848 *(I, 3)* General survey of poets and prose writers of the period including the major Romantics (Lamartine, Vigny, Hugo, Musset, and novelists such as Stendhal and Balzac). *(Lec. 3) Pre: 325 or 326 or permission of instructor.* Touloudis

454 Nineteenth-Century Literature since 1848 *(II, 3)* General survey of poets and prose writers of the period including the major Realists (Flaubert, Zola) and Symbolists (Baudelaire, Verlaine, Rimbaud). *(Lec. 3) Pre: 325 or 326 or permission of instructor.* Chartier

461 Twentieth-Century Theatre *(I, 3)* Representative dramatists. *(Lec. 3) Pre: 325 or 326 or permission of instructor.* Waters

465 Twentieth-Century Prose *(I, 3)* Major prose works of this period including those of Proust, Gide, Mauriac, Colette, Sartre, Camus, the new novelists, and others. *(Lec. 3) Pre: 325 or 326 or permission of instructor.* Kuhn

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: 325 or 326 or permission of instructor.* Chartier

474 Black Literature in French *(I, 3)* Authors of Africa and the Diaspora; includes Camara, Cecaire, Dadie, Senghor. *(Lec. 3) Pre: 325 or 326 or permission of instructor.* Waters

480 Business French *(I or II, 3)* Study of concepts and terminology relating to the French business world. *Pre: junior standing; completion of or concurrent enrollment in at least one 300-level course in the French language.* Morello

497, 498 Directed Study *(I and II, 3 each)* For the advanced student. Individual research and reports on problems of special interest. *Pre: acceptance of a project by a member of the staff and departmental approval.* Staff

501 Advanced Composition *(II, 3)*
503 History of the French Language *(II, 3)*
513 Seminar in Medieval Literature *(I, 3)*
523 Seminar in Sixteenth-Century Literature *(I, 3)*
533 Seminar in Seventeenth-Century Literature *(I, 3)*
544 Seminar in Eighteenth-Century Literature *(II, 3)*
554, 555 Seminar in Nineteenth-Century Literature *(I and II, 3)*
564 Seminar in Modern Poetry *(I, 3)*
565 Seminar in Twentieth-Century Theatre *(II, 3)*
566 Seminar in Twentieth-Century Prose *(I, 3)*
594 Special Topics *(I and II, 3)*

Genetics

Coordinator: Assistant Professor Mottinger

Aquacultural Science and Pathology
352 General Genetics
354 Genetics Laboratory

Botany
352 General Genetics
454 Genetics Laboratory
554 Cytogenetics
579 Advanced Genetics Seminar

Microbiology
552 Microbial Genetics

Plant Science
472 Plant Improvement

Zoology
471 Evolution
476 Human Genetics
576 Ecological Genetics
579 Advanced Genetics Seminar

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 megalopolis and the emergent world city in terms of man-earth-space-resource relationships. *(Lec. 3)* West (S)

102 Geography of Social Issues *(I and II, 3)* Geographic perspective of socioeconomic processes in the city. Emphasis on spatial patterns of social mobility, ethnic diversity, class interaction, and problems of adaptation to the urban-industrial environment. Simulation games. *(Lec. 3)* Krausse (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)* Alexander (S)

Geology (GEL)

Chairperson: Professor Boothroyd

100 Environmental Geology *(I, 3)* Geologic processes and how they affect people; geologic hazards, earthquake impact, shoreline development, offshore oil, waste disposal, water and other resources, nuclear power plant siting; local issues emphasized. *(Lec. 3)* Cain and Staff (N)

101 Geological Field Trips *(I, 1)* Field trips to coastal, glacial, and rock exposure. The relation of structures and materials to the history of the earth, mineral resources, and our environment. *(Lab. 2) In alternate years, next offered 1988-89.* Frohlich

102 The 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 Physical Geology *(I, 3)* Physical processes on and within the earth; its composition; development and modification of surficial features and their relationships to internal processes; resource and environmental aspects. *(Lec. 3) Not open to students who have passed 105. Pre: concurrent registration in 106.* Hermes (N)

105 Geological Earth Science *(I and II, 3)* Introductory study for non-geology majors. Volcanism, earthquakes, mountain building, ice ages, history of the earth, evolution of life. Current topics such as plate tectonics, seafloor spreading, environmental geology, and lunar geology. *(Lec. 3) Not open to students who have passed GEL 103 or 104.* Staff (N)

106 Introductory Geology Laboratory *(I, and II, 1)* Introduction to minerals and rocks, their physical properties and mode of origin; geologic and topographic map interpretation. *(Lab. 2) Pre: prior or concurrent registration in 103 or 105.* Staff (N)

301 Geology of Mineral Resources *(I, 3)* Origin, distribution, extraction, and importance of various mineral resources; energy sources, metals, building and industrial materials, water. Strategic minerals, their world distribution and part played in world affairs. *(Lec. 3) Pre: 103 or 105 and 106 or permission of instructor.* Cain

303 Environmental Remote Sensing *(II, 3)* Introduction to interdisciplinary aspects of environmental remote sensing, including image and non-image sensing applied to geographic mapping, land-use, forestry, geology, engineering, urban-industrial patterns, wildlife management, ecology. *(Lec. 2, Lab. 2) Pre: 100, or 103, or 105 or NRS 100 or junior standing or permission of instructor.* Staff

320 Hand Sample Mineralogy and Petrology *(I, 4)* Crystallography and physical properties of minerals related to crystal structure. Composition, classification, genesis, and interpretation of rocks as related to geological occurrence. Emphasis on hand sample identification. *(Lec. 2, Lab 4) Pre: 103, or 105 and 106, and CHM 101 or 103 (or concurrent registration).* Staff

321 Optical Petrography and Petrogenesis *(II, 4)* Continuation of 320 emphasizing optical mineralogy and petrography. Petrogenesis and associations of igneous, sedimentary and metamorphic assemblages. *(Lec. 2, Lab. 4) Pre: 320, PHY 112 or 214, CHM 112, may be taken concurrently.* Murray

370 Structural Geology *(II, 4)* Stress and strain relationships as they pertain to rocks. Manifestations of these phenomena in geologic structures and criteria for recognizing them. *(Lec. 3, Lab. 2) Pre: 103 or 104, or 105 and 106, PHY 213 and 285 or 111, 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 1990.* Cain

410 Geomorphology *(I, 4)* Classification of landforms, their development, distribution and associated geologic processes. Cycles of development of coastal, glacial and fluvial landforms. Laboratory: landform analysis of topographic maps, aerial photographs, and field studies. *(Lec. 3, Lab. 2) Pre: 103 and 104, or 105 and 106, or permission of instructor.* Staff

422 Intermediate Mineralogy—Petrology *(I, 3)* Continuation of crystallography, petrography, mineral/rock groups and petrologic techniques. Emphasis on mineral/rock suites. *(Lec. 2, Lab. 2) Pre: 321.* Hermes and Murray

440 Introduction to Paleontology *(I, 4)* History, methods, nature and problems. Systematic survey of animal organisms found as fossils with particular emphasis on their morphology, taxonomy and geologic distribution. *(Lec. 3, Lab. 2) Pre: 104 or 105 and 106, ZOO 111 or BIO 102, or permission of instructor.* Fastovsky

450 Introduction to Sedimentation and Stratigraphy *(I, 4)* Principles underlying formation, composition, sequence, and correlation of sedimentary rocks. Methods, procedures, and techniques to study sedimentary processes, depositional environments, stratigraphic relationships, and stratigraphic correlation. *(Lec. 3, Lab. 2) Pre: 321 or permission of instructor.* Boothroyd

465 Introduction to Geophysics *(I, 3)* Introduction to physical properties of the earth and application of geophysical exploration techniques. Seismic, gravity, magnetic and electrical field techniques; basic methods of interpretation. *(Lec. 2, Lab. 2) Pre: 103 or 105 and 106, PHY 112 or 214, MTH 142, or permission of instructor.* Frohlich

475 Geology of Petroleum *(II, 3)* Introduction to the geology of petroleum; the origin, migration and accumulation of hydrocarbons. Reservoir characteristics, traps, surface, and subsurface exploration methods, drilling methods, and products. *(Lec. 2, Rec. 2) Pre: 370 and 450. In alternate years.* Staff

480 Summer Field Camp *(SS, 4-8)* Geologic field mapping and principles. *Course not offered through URI; prior approval of selected camp required by the Geology Department. Recommended between junior and senior years. Not for graduate credit. Pre: 321, 370, 410, 440, 450 recommended.* Staff

485 (or CVE 485) 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 engineering geology and geotechnical engineering. *(Lec. 2, Lab. 2) Pre: 103, 106, MTH 142, PHY 111, and junior standing or permission of instruc-*

tor. In alternate years, next offered 1988-1989. Frohlich, Urish

487 Quantitative Geology *(II, 3)* Introduction to the management and analysis of data in geology using microcomputers. Applications of statistical, graphic, spreadsheet and other programs to structural geology, geomorphology, petrology, geochemistry, geophysics, and sedimentology. *(Lec. 2, Lab. 2) Pre: MTH 142, CSC 201, and senior standing or permission of instructor. In alternate years, next offered 1989-90.* Frohlich

488 Geological Evolution of North America *(II, 3)* Advanced treatment of the evolution of major sedimentary basins of North America within a tectonic framework. Regional paleoenvironments and paleogeography through time reconstructed from lithofacies and faunas. Ten-day field trip to southern Appalachians. *Pre: 440 and 450. Not for graduate credit.* Fastovsky and Boothroyd

491 Special Topics *(I and II, 1-3)* Advanced work for undergraduates under the supervision of a member of the faculty, arranged to suit the individual requirements of the student. *Not for graduate program credit. Pre: permission of instructor.* 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. *(Lab. 6) Pre: senior standing and permission of instructor. Not for graduate degree program credit.* Staff

510 Coastal Geomorphology *(II, 3)*
512 Geologic Terrain Remote Sensing *(II, 3)*
515 Glacial Geology *(I, 3)*
527 Analytical Geochemistry *(II, 3)*
530 Igneous Petrology *(II, 3)*
531 Metamorphic Petrology *(II, 3)*
550 Sedimentary Processes *(I, 3)*
553 Basin Analysis *(II, 3)*
554 Sedimentary Petrology *(I, 3)*
565 Advanced Interpretation in Applied Geophysics *(II, 3)*
566 Seismology and Plate Tectonics *(II, 3)*
570 Structural Analysis *(I, 3)*
571 Structural Petrology *(II, 3)*
577 Coastal Geologic Hazards *(II, 3)*
580 New England Geology *(I, 3)*
585 Geohydrology *(II, 3)*
588 Advanced Geological Evolution of North America *(II, 4)*
590, 591 Special Problems *(I and II, 1-3)*

German (GER)

Section Head: Professor Dornberg

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.* 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. *Pre: 103 or equivalent.* Staff (F)

105, 106 Basic Conversation I and II *(I and II, 1 each) 105:* Practice in conversational skills. *Pre: 103 or concurrent registration in 103. 106:* Continued practice in conversational skills. *(Lec. 1) Pre: 104 or concurrent registration 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) Not for majors. Pre: 111 or equivalent for 112.* 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

121 Conversational German for Business and Travel *(SS, 4)* Intensive study of the fundamentals of German with special emphasis on the listening and speaking skills pertinent to international business. *Not for major in German. (Lec. 4)* 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)* 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. *Pre: 112 or equivalent.* Grandin

305 Advanced Conversation *(I, 3)* Intensive practice in spoken German based upon matters of current interest in the German-speaking countries. *(Lec. 3) Pre: 206 or equivalent. In alternate years, next offered 1989-90.* Crossgrove

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, next offered 1988-89.* Crossgrove

315, 316 Language Study Abroad *(I and II, 3-5 each)* Credit for advanced language study in a German-speaking country. *Pre: 206 or equivalent and permission of department.* Staff

325 Introduction to Modern German Literature: Genres *(II, 3)* Traditional and recent forms of narrative, drama, and lyric as illustrated by leading writers from 1885 to the present. *(Lec. 3) Pre: 104 or equivalent. In alternate years, next offered 1989-90.* Staff (A)

326 Introduction to Modern German Literature: Movements *(II, 3)* Literary and cultural developments as reflected by leading writers from 1885 to the present. *(Lec. 3) Pre: 104 or equivalent. In alternate years, next offered 1988-89.* Staff (A)

392 Masterpieces of German Literature *(II, 3)* Literary works from 1800 to the present in English translation. *(Lec. 3) May not be used toward a major in German.* Staff (A) (F)

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; 305, 306, or concurrent registration in 305 or 306.* Grandin

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 a prerequisite for 442. In alternate years, next offered 1988-89.* Grandin

451, 452 German Literature of the Nineteenth 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. 451 is not a prerequisite for 452. In alternate years, next offered 1989-90.* Dornberg

485, 486 Special Studies *(I and II, 3 each)* Special topics in German literature not emphasized in other courses. *(Lec. 3) Pre: one semester of German at the 300 level or permission of department. In alternate years, next offered 1988-89.* Staff

497, 498 Directed Study *(I and II, 1-3)* Designed particularly for the advanced student. Individual research and reports on problems of special interest. *Pre: acceptance of a project by a member of the staff and permission of department.* Staff

586 Seminar in German Studies *(I, II and SS, 3)*
598 Directed Studies *(I, II and SS, 1-3)*

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)* Gutchen (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)* Gutchen (L)

325 History of European Socialism *(I, 3)* Historical development of socialism in Europe since beginning of the Industrial Revolution, emphasis on socialist movements and ideologies in Germany, France, Russia, and England. *(Lec. 3)* Honhart (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 and Honhart

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)* Silvestri (F)

332 History of Russia to 1917 *(I, 3)* Russian origins in medieval Kiev and rise of autocracy in Muscovy. Imperial Russia's development in eighteenth and nineteenth centuries. Emphasis on social and cultural change. *(Lec. 3)* Thurston (F) (L)

333 History of the Soviet Union *(II, 3)* Russian history from the revolutions of 1917 to the present. Emphasis on the reconstruction of Russian institutional life by the Bolsheviks, and political, economic, intellectual, and ideological developments. *(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 and Crisis of the Union: America from 1789 to 1860 *(I or II, 3)* Transformation of society and politics: emergence of mass political parties; social antagonisms and urban violence arising from conflicts over immigration, industrialization, drinking, sex, slavery, and female roles. Impending crisis between North and South. *(Lec. 3)* Murphy

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 and Findlay

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)

342 Social and Intellectual History of the United States to 1865 *(I, 3)* Survey of social and intellectual development to the end of the Civil War, including literary, artistic, and scientific trends, reform movements and growth of the democratic ideal. *(Lec. 3)* Murphy and Strom (L)

344 History of the North American Indian *(I or II, 3)* Native North Americans from pre-Columbian times to present. Emphasis on ideological conflict between Indians and whites. *(Lec. 3)* Costigliola (F)

346 Immigration to Ethnicity in Modern America *(I, 3)* Nature of population movements to U.S. 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)* Murphy

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. *Pre: 145, 141 or 142, or WMS 200 or permission of instructor.* Strom

352 (347) 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. *Pre: 145, 141 or 142, or WMS 200 or permission of instructor. Not open to students who have completed 347.* 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 U.S. from thirteen colonies to the most powerful nation in the world. *(Lec. 3)* Costigliola (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)* Costigliola (L)

357 History of Religion in the United States *(I, 3)* Background, emergence of evangelical protestant synthesis, disintegration of this synthesis and development of 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, WWII, sexual interaction, and race relations. *(Lec. 1, Lab. 4)* Strom

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

363 American Urban History *(I, 3)* Origins, development and role of cities in America from colonial times to the present. Emphasis on tensions between social change and social control generated by urban growth. *(Lec. 3)* Klein

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, Strom

372 Science in the Modern World *(I or II, 3)* A study of the development of specific scientific innovations and their effects on the scientific community, scientific disciplines, technology, and society in general since the Renaissance. *(Lec. 3)* Briggs

373 (or ZOO 373) History of Biology *(I or II, 3)* Development of basic ideas and paradigms of biology from the Greek world to the present. Emphasis on the period of the last three centuries. *(Lec. 3)* Briggs

374 History of Modern China *(II, 3)* Political, social, economic, and cultural development of China since 1800 with the emphasis on the development of Chinese nationalism and on the rise, theory, and practice of Chinese communism. *(Lec. 3)* Kim (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)* Kim (F)

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. *(Lec. 3)* Marmon (F)

379 Imperialism and its Impact upon Colonized Peoples *(I, 3)* Historical analysis of colonialism and imperialism, the struggle for independence, and the problems confronting newly independent states, with emphasis on the Third World. *(Lec. 3)* Staff

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)* Diaz-Miranda (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)* Diaz-Miranda (F) (L)

383 History of Modern Mexico *(I or II, 3)* Social, economic, and political development of Mexico from 1810 to the present, emphasizing the Revolution of 1910, its background and aftermath. *(Lec. 3)* Diaz-Miranda (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)* Diaz-Miranda (F) (L)

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.* Weisbord (F)

390 War in the Nuclear Age *(II, 3)* American military history from World War II. Operations in WWII, Korea, Vietnam. Emphasis on the revolution in warfare wrought by nuclear weapons, current conventional and nuclear strategies. probable consequences of nuclear war. *(Lec. 3) Pre: junior standing.* Silvestri

391 Directed Study or Research *(I and II, 3)* Special work arranged to meet the needs of individual students who desire advanced work. *(Lec. or Lab.) Pre: permission of department.* 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. *With departmental permission can be taken more than once.* Staff

395 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. *Required for history concentration. Open to majors only. May be repeated once for credit with a different topic and instructor's permission.* 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. *Usually taught in conjunction with ENG 397. (Lecture and field trips)* 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, Klein (L)

451 Historical Society and Museum Administration *(II, 3)* Survey of historical societies, museums, and preservation agencies; the collection, care and interpretation of historical artifacts and documents; problems facing historical agencies. Student work programs and museum visits. *(Lec. 3)* Klyberg

500 Colloquium in Selected Topics in History *(I or II, 3)*
502, 503 Special Readings in European History *(I and II, 3)*
505 Seminar in Selected Topics in History *(I or II, 3)*
536, 537 Special Readings in American History *(I and II, 3 each)*
544 (or LRS 544) Colloquium in Worker History *(I or II, 3)*
588, 589 Special Readings in Third World History *(I and II, 3 each)*
591 Directed Study or Research *(I and II, 3)*

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. *(Lec. 1) Pre: HSS 320 and field experience. Intended for general home economics majors. Not for graduate credit.* Staff

Home Economics Education (HED)

334 Teaching-Learning Strategies *(I, 3)* Instructional strategies for home economics areas. Selection of resource materials and techniques based on objectives, needs, and characteristics of learners and sound educational principles. (On-site observations and teaching experiences.) *Pre: EDC 101 and 12 credits in home economics, or permission of instructor.* Staff

337 Teaching Effectiveness *(II, 4)* Development of curriculum materials specific to individualized instruction; focus on communication skills in an educational setting; implementation of advanced methods and techniques in a microteaching and school setting. *(Lec. 2, Lab. 4) Pre: 334.* P. Kelly

478, 479 Problems in Home Economics Education *(I and II, 1-3 each)* Advanced work in home economics education. Seminars or supervised individual projects. *(Lec. or Lab.) Pre: permission of department.* Staff

482 Field Experience *(I and II, 1-3)* Supervised teaching experience in home economics in either a school or non-school setting. (Not synonymous with experience gained in 483 or EDC 484.) *Not for graduate degree credit. Pre: 337 (or concurrent registration), 12 credits in a selected area or permission of department. S/U credit.* Staff

483 Teaching Alternatives *(I, 8)* Directed field experience in home-economics-related areas for students who do not wish teacher certification. *Not available to teacher certification undergraduate students or for graduate degree program credit. (Field experience 240 hours) Pre: 337 (or concurrent registration), 12 credits in a selected area. Permission of department. S/U credit.* Staff

491 Teaching Home Economics: Adults *(II, 3)* Planning and preparing curriculum materials for adult education classes in home economics, based on adult needs and interests. Participation in actual teaching. *One-half semester course which may be taken concurrently with EDC 484. Pre: 334 or permission of department.* P. Kelly

506 Instructional Communications *(I or II, 3)*
507 Curriculum Development *(I or II, 3)*
508 Supervision of Student Teachers *(I or II, 3)*
509 Seminar in Home Economics Education *(I or II, 3)*
531 (or FSN 531) Teaching of Nutrition *(I or II, 3)*
586, 587 Problems in Home Economics Education *(I and II, 3 each)*

Honors Program (HPR)

Director: Professor Lausier

Honors courses are open only to eligible students. Consult the Special Academic Opportunities *section of this bulletin or the Honors Program brochure for requirements. Sections of honors courses that have been approved for General Education credit in particular areas are so indicated.*

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. Staff (A)

103 Analytical Thinking in the Natural Sciences *(I, 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. *(Lec. 3)* 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. Staff (L)

111 Honors Course in Fine Arts *(I and II, 1-4) Fall 1988: Collage and Assemblage I.* Klenk

112 Honors Course in Language or Literature *(I and II, 1-4) Fall 1988: Masterpieces of World Literature.* Barker (A); *Short Fiction.* Burke (A)

113 Honors Course in Philosophy *(I and II, 1-4) Fall 1988: The Birth and Death of Community.* Johnson

114 Honors Course in History *(I and II, 1-4)*

115 Honors Course in Political Science or Economics *(I and II, 1-4)*

116 Honors Course in Sociology or Anthropology *(I and II, 1-4)*

117 Honors Course in Psychology *(I and II, 1-4)*

118 Honors Course in Speech Communication or Journalism *(I and II, 1-4) Fall 1988; Interpersonal Communication, Face-to-Face and Computed Mediated.* Brownell (C); *Spring 1989: Computer-Assisted Public Speaking.* Brownell (C)

119 Honors Course in Interdisciplinary Studies *(I and II, 1-4) Fall 1988: Introduction to Theory and Application of Aging.* Spence (S); *Introduction to Human Services.* McKinney; *Spring 1989: Mute Stones and Vocal Humanity.* Bailey (L)

121 Honors Course in Mathematics *(I and II, 1-4) Spring 1989: Graphic Displays of Data.* Heltshe

122 Honors Course in Physical Sciences *(I and II, 1-4) Fall 1988: Honors Physics.* Kahn (N); *Honors Physics Lab.* Kahn (N); *Spring 1989: Honors Physics.* Kahn (N); *Honors Physics Lab.* Kahn (N); *Introduction to Pharmacy.* Mattea

123 Honors Course in Biological Sciences *(I and II, 1-4)*

201, 202 Honors Colloquium *(I and II, 3 each) Fall 1988: Knowledge and Its Uses.* Willis and Johnson

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. *Pre: Must qualify for Honors Program.* Pasquerella

301, 302 Honors Tutorial *(I and II, 3 each)*

311 Honors Tutorial in Fine Arts *(I and II, 1-3) Fall 1988: Collage and Assemblage II.* Klenk

312 Honors Tutorial in Language or Literature *(I and II, 1-3) Fall 1988: Religion and Revolution in Modern Russian Literature.* Aronian (A) (F); *Spring 1989: Shakespeare: A Study of His Principal Tragedies and Comedies.* Barker; *Women Dramatists/Women Dramatized.* Burke; *Russian Autobiography in its European Context.* Aronian

313 Honors Tutorial in Philosophy *(I and II, 1-3) Fall 1988: Wondering About Childhood/Freud and Philosophy.* Johnson

314 Honors Tutorial in History *(I and II, 1-3)*

315 Honors Tutorial in Political Science or Economics *(I and II, 1-3) Fall 1988: Issues and Problems in American Politics.* Zucker

316 Honors Tutorial in Sociology or Anthropology *(I and II, 1-3)*

317 Honors Tutorial in Psychology *(I and II, 1-3)*

318 Honors Tutorial in Speech Communication or Journalism *(I and II, 1-3)*

319 Honors Tutorial in Interdisciplinary Studies *(I and II, 1-3) Fall 1988: New England and the Sea.* Schoonover

321 Honors Tutorial in Mathematics *(I and II, 1-3)*

322 Honors Tutorial in Physical Sciences *(I and II, 1-3)*

323 Honors Tutorial in Biological Sciences *(I and II, 1-3)*

331, 332 Honors Tutorial in Human Science and Services *(I and II, 1-3 each)*

341, 342 Honors Tutorial in Business *(I and II, 1-3 each) Spring 1989: Future Trends in Operations Management.* Ebrahimpour

351, 352 Honors Tutorial in Nursing *(I and II, 1-3 each) Spring 1989: Futuristics and Health Care.* Hall

361, 362 Honors Tutorial in Engineering *(I and II, 1-3 each) Spring 1989: Expert Systems in Engineering.* McEwen

371, 372 Honors Tutorial in Resource Development *(I and II, 1-3 each)*

381, 382 Honors Tutorial in Pharmacy *(I and II, 1-3 each) Fall 1988: Current Issues in Pharmacy Practice.* Mattea

401, 402 Honors Project *(I and II, 3 each)*

411, 412 Honors Seminar *(I and II, 3 each) 411, Fall 1988: Management of Quality Control.* Ebrahimpour; 412, *Spring 1989; Contemporary Mass Movements and Refugee Flows.* Zucker

Human Development, Counseling, and Family Studies (HCF)

Chairperson: Professor Cohen

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 on individual development. *(Lec. 3)* Staff

200 Life-Span Development I *(I and II, 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)* Staff

201 Life-Span Development II *(I and 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)* Staff

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 nursery school. *(Lec. 2, Lab. 2) Pre: 200.* Nursery School Staff

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 in interaction with older people. *(Lec. 3, Rec. 1)* 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

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.* Rae

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.* O'Neill

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 consent of instructor.* Rae

304 Contemporary Philosophies of Guiding Children *(I and II, 3)* Factors involved in developing a philosophy of guidance of children and adolescents. The evolution of present-day theory. Contemporary writers read and discussed. *(Lec. 3) Pre: 203 or permission of instructor.* Staff

310 Adolescent Growth and Development *(I and II, 3)* Physical, psychological, social, and emotional growth and development of individual during adolescent years. *(Lec. 3) Pre: 200 or PSY 232.* Blood

330 Marriage and Family Relationships *(I and II, 3)* Male-female relationships in courtship and the family system as influenced by personality and culture in a changing society. Professional and functional orientation. *(Lec. 3) Pre: junior standing.* Schroeder

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 department. 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.* Clark

380 Field Experiences in Community Agencies *(I and II, 9)* Supervised experience in community agencies for individuals or groups with special needs. Apply for permission by end of fourth semester. *Pre: 12 credits in HCF, permission of department and senior standing.* Frank

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

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. *Pre: 200 and permission of instructor. (Lec. 2, Lab. 2)* 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: 200 or 310 or equivalent.* 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

422 Aging: Case Coordination *(II, 3)* Explores concepts, principles, methods, and models of case coordination for older people; client characteristics and needs; environmental resources; assessment, coordination, evaluation, and advocacy. *(Lec. 3) Pre: 220 and one other aging-related course or permission of instructor.* Staff

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 multi-disciplinary field of mental retardation. *(Lec. 3) Pre: 220 or permission of instructor.* Rubin

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: 330 or SOC 100.* 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)* Cooper

432 Perspectives on Parenting *(I or II, 3)* Comprehensive study of the 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.* Staff

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: 330 or permission of department.* Staff

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. 2, Lab. 2) Pre: permission of instructor.* Blackman

435 Developmental Assessment in Early Childhood *(SS, 6)* Fundamentals and procedures for competency-based assessment in psychomotor, language, cognitive, social and pre-academic skills with curriculum implications. Lectures and laboratory experiences provide theory and practice within a developmental framework. *(Lec. 4, Lab. 4) Pre: student teaching or equivalent experience and 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. *(Sem. 3) Pre: 330 or SOC 212, or permission of instructor.* Christner

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 in both professional and paraprofessional settings to interviewing and counseling skills. Integrates theory, practice, and application by didactic and experimental learning. *(Lec. 3) Pre: graduate standing or permission of department.* Staff

497, 498 Special Problems *(I and II, 1-3 each)* Open to qualified seniors or graduate students who wish to do advanced work. *(Lec. or Lab. according to nature of problem) Pre: senior standing and permission of department.* Staff

500 Child Development Seminar *(I or II, 3)*
501 Seminar in Early Childhood Education *(I or II, 3)*
502 Cognitive Aspects of Early Childhood *(I and II, 3)*
504 Contemporary Theories of Ego Development *(II, 3)*
505 Theories and Issues in Human Sexuality *(I or II, 3)*
520 Developmental Issues in Later Life *(I, 3)*
527 Health Care Policy and the Elderly *(II, 3)*
529 Practicum Seminar in Gerontology *(I and II, 1)*
530 Family Theory Seminar *(I, 3)*
535 Families Under Stress: Coping and Adaptation *(I or II, 3)*
550 Vocational Information and Career Development *(I or II, 3)*

Gerontology

Director: Professor Spence

Human Development, Counseling and Family Studies
220 Gerontology: Theory and Application
221 Work with the Aging
420 Human Development During Adulthood
421 Death, Dying, and Bereavement
422 Aging: Case Coordination
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 Aging and/or Chronically Ill

Education
410 Seminar and Supervised Field Practicum in Education of the Aging

Food Science and Nutrition
307 Nutrition and Aging

Human Science and Services
530 Multidisciplinary Health Seminars for the Elderly

Nursing
346 Aging and Health

Physical Education
563 Fitness Programs for the Middle-Aged and Elderly
564 Physiology of Aging

Recreation
416 Physical Aging and Leisure Skill

Sociology
438 Aging in Society

Greek (GRK)

Chairperson: Professor Dornberg (Department of Languages)

101 Ancient Greek I *(I and II, 3)* Grammar and syntax of ancient Attic Greek combined with reading practice. In the second semester a text of standard Attic prose is read. *(Lec. 3) Pre: no prior Greek.* Staff (F)

102 Ancient Greek II *(I and II, 3)* Continuation of 101. *Pre: 101 or equivalent.* Staff (F)

109, 110 Introduction to Ancient Greek Culture *(I, II, 3)* Aspects of Greek culture — literature, religion, myth, philosophy, art, private life, archaeology, and etymology — studied through readings in English translation, color slides, and lectures. *(Lec. 3)* Staff (F)

301, 302 Directed Readings in Greek *(I, II, 3-12)* Study of Ancient Greek writers selected in accordance with the needs and background of the student. May be repeated with different topic for additional credit. *(Lec. 3-12) Pre: 102 or equivalent and permission of instructor.* Staff (F)

497, 498 Directed Study *(I and II, 3)* Individual research and reports on problems of special interest. *Pre: acceptance of a project by a member of the staff and departmental approval.* Staff

Health (HLT)

Acting Chairperson: Associate Professor Crooker (Physical Education, Health and Recreation)

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

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) S/U only.* Staff

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 department.* DelSanto

358 Current Problems of Safety and First Aid *(I, 3)* Major emphasis on content, methods, procedures, and techniques of teaching safety. Reports on the latest developments in teachers' liability and responsibilities for accidents to school children. *(Lec. 3)* Nedwidek

359 Field Work in Health *(I and II, 3)* Directed participation in community health education in cooperation with community health organizations. Weekly seminars. *(Lab. 6) Pre: 357 or permission of department.* Staff

367 School Health Program *(I, 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)* DelSanto

372 Instructor's First Aid *(I or II, 1)* For students and teachers who have completed the advanced course within two years, and desire to certify pupils in Junior, Standard and Advanced First Aid courses. *(Lec. 1)* Staff

377 Current Health Problems *(I and 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. *Pre: 367 or permission of department.* O'Donnell

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 391.

457 Health and Safety Issues of Consumer Products
See Consumer Studies 457.

459 Birth Defects: Family and Community Health Perspectives *(SS, 3)* Consideration of the effects of a birth defect on the individual, the family, and society. Includes basic information on genetic diseases and professional treatment. *Pre: junior standing in one of the health or helping professions and permission of the instructor.* Staff

484 Supervised Field Work
See Physical Education 484.

486 Field Experience Seminar
See Physical Education 486.

560 (or PED 560) Seminar in Health, Physical Education and Recreation *(I or II, 3)*
570 (or PED 570) Major Health Problems and Curriculum Planning in Health Education *(I or II, 3)*
591 (or PED 591) Special Problems *(I or II, 3)*
595 (or PED 595) Independent Study *(I or II, 3)*

Hebrew (HBW)

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.* Jagolinzer (F)

102 Beginning Hebrew II *(I or II, 3)* Continuation of 101. *Pre: 101 or equivalent.* Jagolinzer (F)

History (HIS)

Chairperson: Professor Cohen

103 Special Topics in Western Civilization *(I and II, 1-3)* Topical approach to, rather than a survey of, Western civilization. Topics vary from semester to semester. *(Lec. 3)* Staff (L)

105 Freshman Seminar in History *(I or II, 3)* Re-creating the past by the use of original historical source materials in topics and areas to be selected. *Limited to 15 freshmen. Pre: permission of department.* Staff (L)

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)* Daniel (F) (L)

112 History of Medieval Europe *(II, 3)* Primarily western Europe. Follows 111. Medieval church, feudalism, revival of town life, commerce, industry and money economy, rise of national states and development in the arts. *(Lec. 3)* Daniel (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. *Not open to students who have passed 122.* Gutchen (F)

125 Introduction to German History *(I or II, 3)* A topical introduction to traditions and movements which have shaped German history in the modern era. *(Lec. 3)* Honhart (F)(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. 3)* Staff (L)

142 History of the United States since 1877 *(I or II, 3)* General social, economic and political development to the present. *(Lec. 3)* Staff (L)

143 Special Topics in the History of the United States *(I and II, 1-3)* Topical approach to, rather than a survey of, American history. Topics vary from semester to semester. *(Lec. 3)* 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 Introduction to Afro-American History *(I or II, 3)* Survey of Negro 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 as those aspects relate to and influence contemporary developments. *(Lec. 3)* Kim (F) (L)

174 Islamic Civilization in Asia, 570 to the Present *(I, 3)* Cultural history of the Muslim people of Asia with emphasis on the religion, social organization, architecture, painting, and music of the Arab, Turkic and Persian peoples. *(Lec. 3)* Marmon (F)

175 Islamic Civilization in Africa and Spain, 570 to the Present *(II, 3)* Cultural history of the Muslim peoples of Africa and Spain with emphasis on religion, social organization, architecture, painting, and music. *(Lec. 3)* Marmon (F)

180 Introduction to Latin American Civilization *(I or II, 3)* Social, cultural and political history of the Latin American region from the pre-conquest era to the present time. *(Lec. 3)* Diaz-Miranda (F) (L)

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)* Daniel (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)* Daniel (F) (L)

306 The Protestant and Catholic Reformation I *(I, 3)* Change of European society resulting from Protestant Reformation and Catholic Reaction; rise of secular states and emerging national states; effects of religious crises upon culture and society. *(Lec. 3)* Daniel (F) (L)

307 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)* Daniel (F) (L)

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.* Silvestri (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.* Silvestri (F) (L)

311 History of Europe since 1914 *(II, 3)* Detailed study of developments from 1914 to present: wars, post-war adjustments, communist and fascist ideologies, history of individual states, and social and intellectual trends. *(Lec. 3) Pre: junior standing.* Silvestri (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)

315 Nineteenth- and Twentieth-Century European Cultural History *(II, 3)* Intellectual and cultural movements from Romanticism through Existentialism. *(Lec. 3)* Thurston (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)* Gutchen (L)

322 History of England: 1660-1815 *(II, 3)* Political, economic, religious, and cultural change from the Stuart restoration to the emergence of Britain as a world power at the end of the Napoleonic wars. *(Lec. 3)* Gutchen (L)

551 Counseling Theory and Techniques *(I and II, 3)*
553 Counseling Practicum *(I and II, 3)*
554 Individual Appraisal in Human Services *(I or II, 3)*
555 Gerontological Counseling *(I or II, 3)*
559 Women and Therapy *(I or II, 3)*
560 Group Procedures in Counseling *(I and II, 3)*
562 Organization Development in Human Services *(II, 3)*
563 Marital and Family Therapy I *(I, 3)*
564 Marital and Family Therapy II *(II, 3)*
565 Family Therapy Practicum *(I and II, 3)*
566 Theoretical and Clinical Problems *(II, 3)*
567 Principles and Practices of Student Personnel Services in Higher Education *(I, 3)*
568 Organization and Administration of Student Personnel Services in Higher Education *(II, 3)*
570 Research in Human Development and Family Studies *(I and II, 3)*
580, 581 Professional Seminar in Counseling *(I and II, 3 each)*
582 Field Experience in Human Development and Family Studies *(I or II, 3)*
583, 584 Master's Internship *(I and II, 3 or 6 each)*
590 Higher Education Law *(I or II, 3)*
597, 598 Advanced Study *(I and II, 1-3 each)*

Human Science and Services (HSS)

Dean: Associate Professor Brittingham

222 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 125, PSC 113, SOC 102, PSY 113, HCF 200 or 201.* McKinney

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) Pre: permission of instructor.* 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)* Willis and Russo (S)

390 Topics in Human Science and Services *(I or II, 1-3)* Study of contemporary issues in the field of human services. Subject and course content will vary according to expertise and availability of instructor. *May be repeated with different topic. Pre: permission of instructor.* Staff

491, 492 Special Problems *(I or II, 1-3)* Independent study. Advanced work in the human services under the supervision of a faculty member. *Not for graduate credit. Pre: permission of instructor and the Division of Interdisciplinary Studies.* Staff

530 Multidisciplinary Health Seminars for the Elderly *(I or II, 3)*

Industrial and Manufacturing Engineering (IME)

Chairperson: Professor Boothroyd

220 Introduction to Industrial Engineering *(I, 3)* Role of industrial and manufacturing engineers, organization for optimum productivity, work measurement, labor relations, wage and salary administration, facilities and process design, safety, robotics, and other computer-aided manufacturing technology. *(Lec. 3) Pre: MTH 142, CSC 201.* 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 214, credit or registration in CVE 220.* Staff

325 Computer Solution in Industrial Engineering Problems *(II, 3)* Problems in mathematical programming, inventory and production systems, networks, and other large scale systems where computer is needed to reach a solution. Numerical methods. Introduction to microprocessor. *(Lec. 3) Pre: CSC 201, IME 411, 432.* Shao

332 Industrial Manufacturing Processes *(II, 3)* Application and practical fundamentals of forming, casting, joining processes in manufacturing and their relation to deformation, structure or state of material. Includes study of non-traditional processes, such as electrodischarge machining, etc. *(Lec. 3).* 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, CVE 220.* Brown and Schrader

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. *Pre: junior standing and permission of department.* 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 125, MTH 142. Not for graduate credit.* Nichols

411 Probability for Engineers *(I, 3)* Elementary probability theory, random variables, and probability distributions. Moment generating functions, expected values, bivariate normal distributions. Introduction to applied statistics in engineering. *(Lec. 3) Pre: MTH 243.* Lawing or Shao

412 Statistics for Engineers II *(II, 3)* Continuation of 411. Estimation, hypotheses tests, sampling theory, linear regression. Other engineering applications of applied statistics. *(Lec. 3) Pre: 411.* Lawing or Nichols

430 Design and Analysis of Compensation Systems *(II, 3)* Wage and employment theory, job evaluation, motivational systems, supplemental payments; labor force loading, leveling and scheduling. Analysis of influence of unions on labor price theory. *(Lec. 3) Pre: senior standing.* Staff

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

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, MTH 243.* Shao

435 Introduction to Operations Research *(I and II, 3)* Major areas of operations research and their application in systems analysis; development of models and techniques for solving problems such as linear programming, networks, queuing, inventory, and simulation. *(Lec. 3) Pre: MTH 243 or equivalent. Not for undergraduate major credit in industrial and manufacturing engineering.* Staff

441 Metal Casting *(II, 3)* An introduction to the field of metal casting. Areas covered include sand casting, investment casting, die casting, permanent mold casting, risering and gating, alloys, solidification phenomena, and casting design. *(Lec. 2, Lab. 3) Pre: 240, CHE 333 or 437.* Staff

442 Manufacturing Engineering *(I, 3)* Engineering analyses of unit processes common to manufacturing. Bulk deformation, sheet forming, machining, and joining processes. Topics in processing control systems such as numerical control (NC and CNC) and computer-aided manufacturing (CAM). *(Lec. 2, Lab. 3)*

Pre: 240 or 340, MCE 263, CHE 333 or 437. Not for graduate credit. Staff

443 Machining and Machine Tools *(I, 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.* Boothroyd or Dewhurst

444 Assembly and Handling Automation *(II, 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.* Boothroyd

446 (or MCE 446) Metal Deformation Processes *(I, 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 and CVE 220, CHE 333.* Dewhurst

449 (or MCE 449) Product Design for Manufacturability *(II, 3)* Introduces techniques for analyzing the suitability of product designs for manufacture. Consideration of the manufacture of the piece parts and the potential for automation in entire products. *(Lec. 2, Lab. 3) Pre: 240 or 340, 446 or permission of instructor.* Boothroyd or Dewhurst

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. *Pre: 404, 412, 432, or permission of instructor.* Reynolds

451 Industrial Engineering Systems *(II, 3)* Design and analysis of systems of production facilities and materials handling. Compensation, production, and inventory control systems. Applications of and case problems in operations research, probability and statistics, engineering economy, and other foundation areas. Introduction to simulation. *Pre: permission of instructor.* Staff

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. *(Lec. or Lab. according to nature of problem.) Credits not to exceed a total of 12. Pre: permission of department.* Staff

500 Network Application in Industrial Engineering *(II, 3)*
513 Statistical Quality Assurance *(I, 3)*
514 Special Topics in S.Q.A. *(I, 3)*
517 Applied Control Theory in Industrial Engineering *(I, 3)*
525 Simulation *(II, 3)*
533 Advanced Statistical Methods for Research and Industry *(I, 3)*
535 Industrial Reliability Engineering *(II, 3)*
540 Production Control and Inventory Systems *(I, 3)*
541 Materials Processing and Metrology II *(I, 3)*
542 Introduction to Computer Aided Manufacturing *(I, 3)*
543 Fundamentals of Machining *(I, 3)*
544 Automatic Assembly *(II, 3)*
545 Manufacturing Systems: Analysis, Design, Simulation *(I, 3)*
546 Advanced Metal Deformation Processes *(I, 3)*
549 Advanced Product Design for Manufacturability *(II, 3)*
555 Engineering Applications of Mathematical Programming I *(I, 3)*
556 Engineering Applications of Mathematical Programming II *(II, 3)*
565 Theory of Scheduling *(II, 3)*
591, 592 Special Problems *(I and II, 1-6 each)*

Information Science (ISC)

Director: Professor Futas

344 Introduction to Information Science *(I or II, 3)* Introduction to the theory and concepts of information science; applications in information systems, information processing, and communication systems; emphasis on interdisciplinary study of information and its social importance. Siitonen

348 Information Technology *(I or II, 3)* Introduction to the theory and operations of information processing, transfer, and storage systems. Computer, photographic, audio, and video technologies will be among those investigated. Carson

Insurance (INS)

Chairperson: Associate Professor Dash (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: homeowners insurance, personal automobile insurance, and basic life insurance policies. *(Lec. 3) Proficiency test available.* Staff

313 Commercial Property—Liability Insurance *(II, 3)* Analysis of the basic commercial insurance coverages for property, general liability, and commercial auto exposures. Included will be an examination of the important commercial package policies. *(Lec. 3)* Staff

325 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: course prepares for R.I. state licensing examination in life and accident and health insurance and for Part I of charter life underwriter examination.* Staff

414 Advanced Commercial Property—Liability Insurance *(I, 3)* Examination of specialized insurance coverages for commercial property and liability exposures including ocean and inland marine insurance, commercial crime insurance, suretyship and professional liability. *(Lec. 3) Pre: 313 or permission of instructor.* 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 125 and 126 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. *(Lec. 3) Pre: FIN 331; INS 301, 313, and 325 or permission of instructor.* Staff

491, 492 Directed Study *(I and II, 3)* Directed readings and research work including insurance problems under the supervision of a member of the staff. *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 INS. Fifteen working days (or 120 hours). *Pre: junior standing and proposal approved by the College of Business Administration. May be repeated once for credit. Not for graduate credit. S/U only.* Staff

510 Risk and Insurance *(I, 3)*

Irish (IRE)

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 1989.* 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 1990.* 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.* Staff (F)

102 Beginning Italian II *(I and II, 3)* Continuation of 101. *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. *Pre: 103 or equivalent.* Staff (F)

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 department.* 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: 104 or permission of department.* Staff

305 Advanced Conversation and Composition *(I or II, 3)* Intensive practice in spoken and written Italian. *(Lec. 3) Pre: 206 or permission of instructor.* 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 department.* Viglionese

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: 104 or equivalent.* Viglionese

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: 104.* 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) May not be used for major credit in Italian.* Staff (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) May not be used for major credit in Italian. In alternate years, next offered spring 1990.* Viglionese (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 thirteenth to twentieth century. *(Lec. 3) Pre: 104 or permission of instructor. In alternate years, next offered fall 1989.* Trivelli

455 Selected Italian Authors *(I or II, 3)* Works of one or more major authors of Italian literature. Specific author(s) designated the semester before the course is to be given by the department. *(Lec. 3) Pre: 325 or 326 or permission of instructor. In alternate years, next offered fall 1989.* Sillanpoa

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: 325 or 326 or permission of instructor. In alternate years, next offered spring 1990.* Staff

480 Business Italian *(I or II, 3)* Study of concepts and terminology relating to the Italian business world. *(Lec. 3) Pre: junior standing, completion or concurrent enrollment in at least one 300-level Italian course or permission of instructor.* Trivelli

481, 482 The Works of Dante Alighieri *(I and 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: 325 or 326 or permission of instructor. In alternate years, next offered 1988-89.* 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. *(Lec. 3) Pre: acceptance of a project by a member of the staff and department approval.* Staff

Journalism (JOR)

Acting Chairperson: Professor Campbell

110 Introduction to Mass Communications *(I and II, 3)* Survey of mass media emphasizing newspapers, wire services, magazines, radio, and television. Examination of economic and news functions of each; role of advertising and public relations. Legal and ethical considerations, restrictions on the press; the mass media as an institution. Recommended for non-majors. *(Lec. 3)* Staff

212 News Writing and Reporting *(I and II, 3)* Fundamentals of news gathering and factual writing for the print media. Practice in writing news and feature stories and covering news events, with evaluation of each student's work. *(Lec. 2, Lab. 2) Pre: ENG (or WRT) 103 or WRT 101 with a grade of C or better; ability to type. Sophomore standing or permission of instructor.* Staff

215 Pictorial Journalism *(I and II, 3)* Introduction to use of photography in the print communication media with instruction and practice in basic techniques of picture-taking, processing, and editing. *(Lec. 2, Lab. 2) Pre: permission of instructor.* Staff

271 Broadcast Journalism I *(I and II, 3)* Gathering and processing news for radio. Principles of broadcast writing and reporting. Techniques of anchoring. Laboratory work includes production of newscasts. *(Lec. 2, Lab. 2) Pre: 212 or permission of instructor.* Staff

300 Media Criticism in America *(II, 3)* Analysis of selected writings of media critics monitoring the performance of newspapers, magazines, broadcasting, and advertising. Practice in writing media criticism. *(Lec. 3)* Staff

312 Intermediate Reporting *(I and II, 3)* Students will cover news events, conduct interviews, interpret documents and generate story ideas. Frequent out-of-class assignments and critiques of student work. Continues development of information-gathering and news writing technqiues. *Pre: (Lec.2, Lab. 2) junior standing, 212 (with a grade of C or better) or its equivalent and permission of instructor.* Staff

324 Magazine Article and Feature Writing *(II, 3)* Practice in planning, researching, and writing articles and feature stories for magazines and newspaper feature sections. Discussion of markets, freelance and job opportunities. Articles written and submitted to publications. *(Lec. 3) Pre: 212, junior standing or permission of instructor.* Staff

325 Copy Editing *(I and II, 3)* Practice in news selection, copy editing, headline writing, illustration, and page makeup of newspapers. *(Lec. 2, Lab. 2) Pre: 212 or permission of instructor.* Staff

326 Advanced Reporting *(I and II, 3)* Planning, developing, and writing complex news stories for publication. Class sessions and outside assignments include press conferences, investigative and interpretive reporting, and reporting in depth. *(Lec. 2, Lab. 2) Pre: 212, junior standing or permission of instructor.* Staff

334 History of Journalism in the United States *(I, 3)* Development of American newspapers, magazines, and broadcast industry with analysis of the ideas which 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, junior standing, or permission of instructor.* Staff

372 Broadcast Journalism II *(I and II, 3)* Gathering and processing news for television. Principles of television news writing, reporting, production, and anchoring. Laboratory work includes on-camera techniques. *(Lec. 2, Lab. 2) Pre: 271 or permission of instructor.* Staff

400 Opinion and Interpretation in Journalism *(II, 3)* Analysis of editorials, columns and reviews such as movies, photography, music, and fashion. Practice in writing critical columns and editorials. *(Lec. 3) Pre: 212 and junior standing or permission of instructor.* Staff

434 Mass Media Issues *(I and II, 3)* Ethical issues and other problems in mass communications affecting journalists and society in general, based on selected readings, study and discussion of current news stories. *(Lec. 3) Pre: senior standing or permission of instructor.* Staff

438 Mass Media Law *(I and II, 3)* Role of government and the law in the communication of news. Legal problems in the mass media including basic laws affecting freedom of the press, press privileges and responsibilities. Case studies. *(Lec. 3) Pre: senior standing or permission of instructor.* Staff

442 Independent Study and Projects in Mass Communications *(I and II, 1-3)* Individual reading programs, research or projects in journalism and mass communications. *Pre: junior standing and acceptance of a project for supervision by a member of the staff.* Staff

452 Public Relations *(I, 3)* Principles and procedures in public relations: emphasis on role of the public relations practitioner as a specialist in communications; analysis of publications produced as a part of public relations. *(Lec. 3) Pre: 212, senior standing or permission of instructor.* Staff

460 Special Topics in Journalism *(I and II, 3)* Subject, course content, and years offered will vary according to expertise and availability of instructors. May be repeated once with change of topic. *Pre: junior standing or permission of instructor.* Staff

461 Internships in Print Journalism *(I and II, 3)* Assignment of an approved sponsor for: a) news writing and reporting; b) editing; or c) public relations. Fifteen working days (or 120 hours) and a one-hour weekly meeting. *(Lec. 1, Prac. 8) Pre: senior standing and permission of department. May be repeated once with a different type of internship (different letter). Not for graduate credit.* Staff

462 Internship in Broadcasting *(I and II, 3)* Assignment of an approved sponsor for: a) radio journalism; b) television journalism. Fifteen working days (or 120 hours) and a one-hour weekly meeting. *(Lec. 1, Prac. 8) May be repeated once with a different type of internship (different letter). 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)*
521 (or PSC 521) International and Comparative Trade Unions and Labor Relations *(I or II, 3)*
526 (or ECN 526) Economics of Labor Markets *(I, 3)*
531 Employment Law *(I or II, 3)*
533 Negotiating Pension, Health, and Employee Assistance Programs *(I or II or SS, 3)*
534 (or ECN 534) Information Sources and Uses in Labor Relations and Labor Economics *(II and SS, 3)*
541 Labor Relations Law *(I or II, 3)*
542 Labor Relations and Collective Bargaining *(I or II, 3)*
543 Labor Relations and Collective Bargaining: Public Sector *(I or II, 3)*
544 (or HIS 544) Colloquium in Worker History *(I or II, 3)*
545 Labor Dispute Settlement *(II, 3)*
546 Alternative Dispute Resolution Processes and Applications *(I or II or SS, 3)*
579 (or EDC 579) Labor Relations and Collective Bargaining in Education *(I, II, or SS, 3)*
580 Professional Seminar: Labor and Industrial Relations *(II, 3)*
581 Internship: Labor and Industrial Relations *(I and II, 3-6)*
590, 591 Directed Readings and Research in Labor and Industrial Relations *(I or II, 3)*

Landscape Architecture (LAR)

Chairperson: Professor Hull (Plant Sciences)

243 (or PLS 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 (or PLS 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

343 (or PLS 343) Techniques in Landscape Design *(I, 4)* Landscape concepts in graphic form. Emphasis on drawing landscape plans for residential property, arrangement of unit areas, ornamental plants suitable for specific landscape situations. *(Lec. 2, Studio 4) Pre: 201, 202.* Dunnington

344 (or PLS 344) Techniques in Landscape Design II *(II, 3)* Continuation of landscape concepts and graphics. Emphasis on drawing landscape plans for intermediate-scale properties. Advanced rendering. *(Lec. 1, Studio 4) Pre: 343.* Dunnington

353 (or PLS 353) Fundamentals of Ornamental Plant Classification *(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 BOT 111.* Simeoni

399 Internship
See Plant Sciences 399.

443 (or PLS 443) Planting Design *(I, 3)* 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. 1, Studio 4) Pre: 343, 353 or 454 or permission of instructor. Not for graduate credit.* Hanson

444 (or PLS 444) Environmental Aspects of Landscape Design *(I, 3)* 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. 1, Studio 4) Pre: 343 and 353 or permission of instructor.* Dunnington

445 (or PLS 445) Advanced Landscape Design *(II, 3)* Study of comprehensive landscape architectural projects. Coordination of research, preparation of contract documents, and office procedures. *(Lec. 1, Studio 4) Not for graduate credit. Pre: 443, 444 or permission of instructor.* Hanson

446 (or PLS 446) Landscape Construction *(II, 3)* The study of soil adjustment; grading, cut and fill, reshaping of earth surfaces. A comprehensive survey of construction materials; asphalt, concrete, wood, and masonry products and their uses in landscape construction. *(Lec. 2, Studio 2) Pre: 343 or permission of instructor.* Dunnington

447 (or PLS 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.* Hanson

454 (or PLS 454) Identification of Basic Ornamental Plants *(II, 3)* Identification and description under winter and spring conditions, classification and adaptation of the coniferous evergreens, vines, and ground covers and their value in ornamental plantings. *(Lec. 1, Lab. 4) Pre: BIO 101 or BOT 111.* Simeoni

Languages (LAN)

Chairperson: Professor Dornberg

191 Beginning Foreign Language I *(I and II, 3)* Fundamentals of grammar and pronunciation; exercises in reading, writing, and con-

versation in a foreign language not included in regular departmental offerings. *(Lec. 3) Pre: no prior experience in specific language. May be repeated 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. *Pre: 191 or equivalent in same language. May be repeated 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 193. 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. *Pre: 193 or equivalent, in the same language as 194. Choice of specific language to be taught subject to availability of staff and student demand.* Staff (F)

Latin (LAT)

Chairperson: Professor Dornberg (Languages)

101 Beginning Latin I *(I and II, 3)* Latin grammar and syntax. Exercises in reading prose. *(Lec. 3) Pre: no prior Latin.* Staff (F)

102 Beginning Latin II *(I and II, 3)* Continuation of 101. *Pre: 101 or equivalent.* Staff (F)

301, 302 Directed Readings in Latin *(I and II, 3-12)* Study of Latin writers selected in accordance with the needs and background of the student. May be repeated with different topics for additional credit. *(Lec. 3-12) Pre: 102 or equivalent and permission of instructor.* Staff (F)

497, 498 Directed Study *(I and II, 3 each)* Individual research and reports on problems of special interest. *Pre: acceptance of a project by a member of the staff and departmental approval.* Staff

Latin American Studies (LAS)

Committee Chairperson: Assistant 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. *Pre: approval of LAS Committee and instructor.* Staff

The following are related courses offered in the Departments of Art, Economics, History, Languages, Political Science, Sociology and Anthropology, and Speech Communication.

Anthropology
303 New World Prehistory
315 Cultures and Societies of Latin America
324 Peasant Societies
470 Problems in Anthropology

Art
283 Topics in Non-European Art

Economics
338 International Trade and Policy
363 Economic Growth and Development

History
180 Introduction to Latin American Civilization
382 History of Modern Latin America
383 History of Modern Mexico
391 Directed Study or Research
580 Colloquium in 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
487 Modern Spanish-American Narrative
497, 498 Directed Study
571 Modern Spanish-American Authors
572 Evolution of Spanish-American Culture and Thought
590 The Hispanic Presence in the United States

Speech Communication
473 Intercultural Communication

Letters (LET)

Coordinator: Professor Grandin

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 in the past and present. *(Lec. 3) May be repeated for credit with a different topic.* Staff

Library (LIB)

Dean: Professor Young

405 Fine Letterpress Printing *(I or II, 3)* History, theory, and practice of fine printing by letterpress, with emphasis on the work of the great private presses. *Pre: permission of instructors. CCE only.* Maslyn and Gutchen

Library and Information Studies (LSC)

Director: Professor Futas

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.

501 Foundations of Library and Information Science *(I or II, 3)*
502 Library Administration *(I or II, 3)*
503 Collection Development *(I or II, 3)*
504 Reference and Information Services *(I or II, 3)*
505 Organization of Library Materials *(I and II, 3)*
506 Technical Services *(I, 3)*
510 History of Books and Printing *(I, 3)*
511 Comparative Librarianship *(I, 3)*
512 History of Libraries and Librarianship *(I, 3)*
513 Intellectual Freedom and Censorship *(II, 3)*
516 Librarianship and Public Policy *(I or II, 3)*
520 The School Library/Media Center *(I, 3)*
521 Public Library Service *(I, 3)*
522 College and University Library Service *(II, 3)*
523 Special Library Service *(II, 3)*
527 Seminar in Library Administration *(II, 3)*
528 Media in the Library *(I or II, 3)*
529 Theory and Production of Library Media Communications *(I or II, 3)*
530 Reading Interests of Children *(I, 3)*
531 Reading Interests of Adolescents *(II, 3)*
536 Storytelling *(SS, 3)*
537 Health Sciences Librarianship *(II, 3)*
538 Law Librarianship *(I, 3)*
540 Library Materials in the Humanities *(I or II, 3)*
541 Library Materials in the Social Sciences *(II, 3)*
542 Library Materials in Science and Technology *(I or II, 3)*
543 Government Publications *(I or II, 3)*
544 Information Science for Librarians *(II, 3)*
546 Computer Systems in Library Automation *(I, 3)*
547 Online Searching and Services *(I or II, 3)*
548 Microcomputer Applications in Library and Information Studies *(I, II, SS, 3)*
549 Information Storage and Retrieval *(I or II, 3)*
550 Advanced Cataloging *(II, 3)*
551 Organization of Nonprint Materials *(I or II, 3)*
560 Research in Librarianship *(II, 3)*

562 Administration of Special Collections, Archives, and Manuscripts *(I or II, 3)*
564 Introduction to Library Conservation *(I or II, 3)*
565 Rare Book Librarianship *(I, 3)*
591, 592, 593 Independent Work *(By appt., 1-3 each)*
595 Professional Field Experience *(I and II, 1-6)*
596 School Library Media Center Practicum *(II, 3 or 6)*
597 Selected Topics *(I and II, 3)*

Linguistics (LIN)

Section Head: Professor Rogers

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. *Pre: 200, 220 or ENG 330.* Rogers (S)

220 (201) (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. 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. *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

402 Syntactic Analysis *(I and II, 3)* A study of primary sources in contemporary research into syntactic structures. Emphasis on developing the ability to construct and test linguistic models. *(Lec. 3) Pre: 220 or ENG 330 or permission of instructor.* Arakelian

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 department. Some knowledge of Latin recommended but not required. Not for graduate degree program credit.* Rogers

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. *(Lec. 1) Pre: 9 credit hours of language courses numbered 300 or above, or permission of department.* Staff

497, 498 Directed Study *(I and II, 3 each)* Individual research and reports on problems of special interest. *Pre: 220 and acceptance of a project by a member of the staff and departmental approval.* Staff

The following are related courses offered in the Departments of Anthropology, Communicative Disorders, English, Languages, Philosophy, Psychology, and Speech:

APG 409 Anthropological Linguistics
CMD 373 Phonetics
CMD 375 Language Development
ENG 337 Varieties of American English
ENG 530 History of the English Language
ENG 534 Structure of the English Language
ENG 536 Problems in Linguistics and Literature
FRN 503 History of the French Language
ITL 408 The Italian Language
PHL 440 Philosophy of Language
PSY 388 Psychology of Language
SPA 409 History of the Spanish Language
SPE 410 Semantics

Literature in English Translation

Coordinator: Associate Professor Kuhn (French)

*The following courses, offered within the Department of Languages may be used for major credit in Comparative Literature Studies. They may not be used for major credit in English or Languages.**

Comparative Literature Studies
250 Themes and Myths
335 Interdisciplinary Studies in Comparative Literature
450 Studies in Comparative Literature

Classics
394 Greek Mythology and Religion: Gods and the Universe
395 Greek Mythology: Gods, Heroes, and Humans
396 Mythology of the Romans
397 Greek Mythology 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
391, 392 Masterpieces of German Literature
393 Topics in German Literature

Italian
391, 392 Masterpieces of Italian Literature
395 Dante's *Divine Comedy*

Russian
391, 392 Masterpieces of Russian Literature

Spanish
391, 392 Spanish Literature in Translation

The following courses offered within the Department of English 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
366 Greek and Roman Drama
367 The Epic
468 Traditions of the Continental Novel
561 Modern European Novel

Literature in English Translation courses and literature courses offered within the Departments of English and Languages constitute part of the offerings for a major in Comparative Literature Studies.

Management (MGT)

Chairperson: Professor Sink

110 Introduction to Business *(I and II, 3)* Nature, philosophy, objectives, and scope of American business system. Emphasis in the interrelations of the functional areas. *(Lec. 3) Not open to juniors and seniors in the College of Business Administration.* Staff (S)

300 Introduction to Management and Supervision *(I or II, 3)* Functions of human resources management including group behavior, interpersonal 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 Fundamentals of Management *(I and II, 3)* Management processes, organizational theory and behavior, quantitative aids, and

*CLA 394, 395, 396, 397 may be used for major credit in Classics; RUS 391, 392 may be used for major credit in Russian.

environmental analysis. Emphasis on developing conceptual and analytical skills through examination of relevant theory, research, and practice. *(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 function 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 sector. Cases and lectures. *(Lec. 3) Pre: 301 recommended.* Staff

306 Skills Development in Organizational Behavior *(I, 3)* Development of managerial skills and competencies in 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 126 or permission of instructor.* Staff

326 Word Processing and Equipment Management *(II, 3)* Development and use of word processing systems, office equipment, reprographics, and records in industry. *Pre: junior standing or permission of department.* Staff

380 Business and Society *(I, 3)* Analysis of the power and position of the corporation as one of a number of organizations involved in social and economic decision making. Contemporary public and social issues confronting management—such as pollution, government regulation, political action committees, equal opportunity, business ethics—are investigated. *(Lec. 3)* Hetzner

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

407 Organization and Management Theory *(I and II, 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)* Analysis of the multi-functional organizational problems and issues confronting top management. *(Lec. 3) Pre: 301, ACC 202, FIN 301, MGS 309, MKT 301, BSL 333, senior standing in the College of Business Administration, or permission of instructor.* 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 effectuating 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. *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. *(Lec. 3) Pre: 301.* Staff

435 Compensation Administration *(I and 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: ECN 301, MGT 303 or permission of instructor. Not for graduate credit.* Staff

437 Human Resource Planning, Selection, and Placement *(I and II, 3)* Recruitment, selection, and placement of human resources. Integration of human resource plans with organizational strategic plans. Career planning and development. Affirmative action and EEO aspects of selection and placement. *(Lec. 3) Pre: ECN 301, 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 department.* 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 CBA 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. Not open to students who have completed 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 the field of organizational management, industrial relations, and law with application to specific individual projects. *(Lec. 3) Pre: permission of department.* Staff

493 Internship in Management *(I or II, 3)* Approved, supervised work experience with participation in management and problem solving related to MGT. Fifteen working days (or 120 hours). *Pre: junior standing and proposal approved by the College of Business Administration. May be repeated once for credit. Not for graduate credit. S/U only.* Staff

530 Management Theory and Practice *(I and II, 2)*

Management Science and Information Systems (MGS)

Chairperson: Professor Jarrett

101, 102 Introduction to Quantitative Analysis for Business and Economics *(I and II, 3 each)* Selected mathematical tools and techniques for analysis of business and economic problems and as aid in process of decision making. Topics from finite and modern mathematics, applied differential and integral calculus. *(Lec. 3) Proficiency test available for 101. Pre: 101 for 102.* Staff (M)

201, 202 Managerial Statistics *(I and II, 3 each) 201:* General statistical methods used in 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 hypoth-

esis. *Pre: 102 or equivalent. 202:* Additional data analysis techniques including tests of independence and goodness of fit, regression, correlation, analysis of variance, time series, and index. *(Lec. 3) Pre: 201.* Staff

207 Introduction to Computing in Management *(I and II, 3)* Computer applications in management and programming fundamentals in one of the common computer programming languages—FORTRAN, BASIC, or PL/I. Assigned problems are debugged and run on the computer. *(Lec. 3)* Staff

301 Advanced Quantitative Foundations *(I, 3)* Mathematical topics and applications useful in analysis of managerial problems, including optimization with constraints, optimization for functions of many variables, multiple integration, differential equations, matrix and linear algebra. *(Lec. 3) Pre: 102 or permission of instructor.* Staff

307 Information Systems for Management *(I, 3)* A survey course providing an overview of computer information systems. Computer hardware, software, business systems, database concepts, data communications, distributed processing, office automation. *(Lec. 3) Pre: 207.* Staff

309 Operations Management *(I and II, 3)* Production and operations management problems, models for their solution. Problems include project management, design and measurement of work, facilities location and layout, quality control, forecasting, production planning and inventory control. *(Lec. 3) Pre: 202 and 207 or permission of instructor.* Staff

310 Capacity Planning and Operations Scheduling *(I, 3)* Intensified coverage of production planning in manufacturing and service industries. Topics include aggregate planning, capacity planning and control, shop floor activity planning and control, and MRP/CPM relationships. *(Lec. 3) Pre: 309 or permission of instructor.* Staff

311 Master Planning and Requirement Analysis *(I, 3)* Intensified coverage of operations planning in manufacturing and service organizations. Topics include: times series forecasting, multi-item forecasting, material requirements planning, master production scheduling. *(Lec. 3) Pre: 309 or permission of instructor.* Staff

364 Introduction to Management Science *(I and II, 3)* Management science techniques including mathematical programming, decision analysis, and simulation with computer applications in the functional areas such as accounting, management, finance, insurance, marketing, and production. *(Lec. 3) Pre: 202, 207, or permission of instructor.* Staff

370 Topics in Managerial Statistics *(I, 3)* Theory and managerial applications of selected topics in statistics, including forecasting techniques, multiple regression, analysis of variance, and experimental and sample designs. *(Lec. 3) Pre: 202 or equivalent.* Staff

445 Managerial Applications of Simulation *(II, 3)* Evaluation and design of deterministic and probabilistic computer simulation models for operational and strategic levels of management. *(Lec. 3) Pre: 202 or permission of instructor.* Staff

450 Forecasting: Computer Applications *(I or II, 3)* Forecasting for students of management, finance, accounting, and marketing. Introduction to methods from simple to ARIMA processes. Use of a variety of software systems and languages, including personal software. *Pre: 202, 207 or equivalents; senior status or graduate student.* Jarrett and Staff

458 Integrated Production-Logistics Systems *(II, 3)* Analysis of integrated logistical support systems within a manufacturing or service firm. Aggregate and multiechelon inventory systems, facility location, material handling, warehousing, and production scheduling. *(Lec. 3) Pre: 309 or equivalent.* Staff

460 Management of Quality Control: Computer Applications *(I, 3)* Management of quality control methods in industry and commerce. Discussion of quality control charts; decision making affecting process control. Use of computer applications to establish quality control programs. *(Lec. 3) Pre: 201, 202, 309, or permission of instructor.* Jarrett, Ebrahimpour, and Staff

465 Advanced Topics in Management Science: Deterministic Models *(II, 3)* Topics in deterministic modeling including advanced linear programming, integer programming, multicriteria decision making and network modeling. Computer applications in functional areas. *(Lec. 3) Pre: 364 or permission of instructor.* Staff

466 Advanced Topics in Management Science: Probabilistic Models *(II, 3)* Topics in probabilistic modeling including decision theory and analysis, queueing, Markov analysis and dynamic modeling, and simulation with computer applications. *(Lec. 3) Pre: 364 or permission of instructor.* Staff

470 Managerial Decision Support Systems *(II, 3)* Use of computer technology and quantitative methods to assist in the decision making process. Emphasis on report preparation, presentations, and computer graphics. *(Lec. 3) Pre: 202, 207, or permission of instructor.* Staff

475 Bayesian Statistics in Business *(I, 3)* Bayesian decision theory as based on the concept of utility and personalistic interpretation of probability. Application of Bayesian inference to decision-making under uncertainty in business. *(Lec. 3) Pre: 202 or permission of instructor.* Staff

483 Business Applications Programming *(I, 3)* Development of business software using COBOL language. Coverage of language syntax; file structures; table processing; sorting; control break reports; editing and validation techniques; maintenance of sequential, direct, and indexed files. *(Lec. 3) Pre: 202, 207.* Staff

484 Management Systems Analysis and Design *(II, 3)* Concepts, methods, and tools used in the design, development, and operation of computer-based information systems. *Pre: 483 or permission of instructor.* Ageloff, Kim, and Westin

485 Management of Databases *(I, 3)* Concepts and methods in management of data: database objectives, definitions, creations, design and implementation; data structures, data models; integrity security; data dictionaries and administration. Evaluation and use of existing systems. *Pre: 483 or permission of instructor.* Ageloff, Kim, and Westin

486 Advanced Programming and Information Structures *(I, II or SS, 3)* Survey of advanced programming problems and techniques found in business software applications. Emphasis on file design and advanced I/O handling in a COBOL environment. *(Lec. 3) Pre: 483.* Westin, Kim, or Ageloff

488 Business Software Development Project *(II, 3)* Application of computer programming and system development concepts, principles, and practices to a comprehensive business system development project. Use of project management methods, project scheduling and control techniques, formal presentation, and group dynamics in the solution of information systems problems. *(Lec. 3) Pre: 483, 484 and 485 or permission of instructor.* Ageloff, Kim, and Westin

491, 492 Special Problems *(I and II, 1-3 each)* Lectures, seminars, and instruction in operations research techniques, emphasis on student research projects. *(Lec. 3) Pre: permission of instructor.* Staff

493 Internship in Management Science *(I or II, 3)* Approved supervised work experience with participation in management and problem solving related to MGS. Fifteen working days (or 120 hours). *Pre: junior standing and proposal approved by the College of Business Administration. May be repeated once for credit. Not for graduate credit. S/U only.* Staff

495 Seminar in Management Science *(I or II, 3)* Preparation and presentation of papers on selected topics. *Pre: 309, senior standing, and permission of instructor. Not for graduate credit.* Staff

500 Computing for Management *(I and II, 2)*

520 Mathematical Methods for Management *(I, or II, 3)*

530 Statistical Methods for Management *(I or II, 3)*

Marine Affairs (MAF)

Chairperson: Professor Juda

100 Human Use and Control of the Marine Environment *(I, 3)* Introduction to man's activities occurring in the marine environment and adjacent land areas. Discussion of marine geography and natural marine processes necessary to understand the controls on man's activities. *(Lec. 3)* Juda

120 Maritime New England *(I or II, 3)* Multidisciplinary analysis of coastal issues in southern New England states. Emphasis on the utilization, impacts and management of the shore environment 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

221 Introductory Cartography *(I and II, 3)* Principles and methods of map design and construction for geographic analysis. Emphasis on compilation, generalization, scaling, and symbolizing quantitative and qualitative data. *(Lec. 1, Lab. 2)* Krausse

312 The Politics of the Ocean *(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: 210.* Juda or Nixon

315 Marine Pollution Policy *(II, 3)* An analysis of actual and potential governmental management techniques for pollution reduction and control in ocean and coastal regions. Emphasis on U.S. practice. *(Lec. 3) Pre: 100 or permission of instructor.* Burroughs

320 Shipping and Ports *(I, 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 or permission of instructor.* Marti

330 World Fishing *(I, 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 or permission of instructor.* Nixon

410 Problems in Marine Affairs *(II, 3)* Advanced work in the management of the marine environment, with special emphasis on case studies and student projects. *(Lec. 3) Required for seniors majoring in marine affairs. Pre: BOT (ZOO) 262 or permission of instructor. Not for graduate program credit.* Alexander

413 Peoples of the Sea
See Anthropology 413.

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) Pre: permission of instructor.* Burroughs

461 Coastal Zone Uses *(II, 3)* Activities in the coastal zones of both developed and developing countries, and the impacts of these activities on the environment. Techniques of accommodating conflicting uses. *(Lec. 3) Pre: junior or senior standing and permission of department.* West

471 Island Systems *(II, 3)* Man's impact on the use, alteration, and control of island ecosystems. Emphasis on sociopolitical and technological developments as they effect changes in the oceanic and coastal island environment. *(Lec. 3) Pre: 210 or permission of instructor. In alternate years.* Krausse

472 Marine Recreation Management *(I, 3)* Analysis of supply and demand of marine-related recreational activities in an urban and exurban context. Analysis of qualitative and quantitative characteristics of user behavior, socioeconomic and environmental impact. *(Lec. 3) Pre: 103 or permission of instructor.* West

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: EST 220 (or preferably EST 408 or its equivalent) and one 100-level geography course; permission of department.* West

491, 492 Special Problems *(I and II, 3 each)* Individual guidance in major readings and methods of geographic research. *(Lec. 3) Pre: permission of department.* Staff

499 Directed Study *(I and II, 1-3)* Individual research and reports on problems of special interest, including honors thesis research. *Pre: acceptance of a project by a member of the staff and departmental approval.* Staff

502 Research Methods in Geography and Marine Affairs *(I, 3)*
511 Ocean Uses and Marine Science *(II, 3)*
512 (or PSC 512) Seminar in Marine Science Policy and Public Law *(I, 3)*
516 (or CPL 516) Seminar on the Urban Waterfront *(I, 3)*
520 Seminar in Coastal Margin Management *(II, 3)*
521 Coastal Zone Law *(II, 3)*
523 Fisheries Law and Management *(II, 3)*
526 Landsat Remote Sensing and Analysis *(II, 3)*
562 Admiralty Law *(I, 3)*
563 Maritime Transportation *(I, 3)*
564 Port Operations and Policy *(II, 3)*
571 Marine Geography *(I, 3)*
572 Management of Ocean Regions *(II, 3)*
577 (or PSC 577) International Ocean Law *(I, 3)*
578 International Ocean Organizations *(II, 3)*
579 Marine Jurisdictional Issues *(II, 3)*
586 Environmental Impact Assessment and Analysis *(I, 3)*
591, 592 Directed Study or Research *(I and II, 1-3)*
595 Problems of Modernization in Developing Nations *(II, 3)*

Marketing (MKT)

Chairperson: Professor Venkatesan

301 Marketing Principles *(I and II, 3)* Marketing from a managerial viewpoint with consumer emphasis. Product, pricing, channels, promotion. Marketing institutions, social welfare, and legal considerations. *(Lec. 3) Proficiency test available only if course was taken at a non-AACSB program prior to transfer to the University* Staff

311 Consumer Behavior *(I and II, 3)* Analysis of review of perception, motivation, and communication behaviors of consumers as they relate to marketing with particular emphasis upon advertising and selling. *(Lec. 3)* 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 Analysis of Sales Methods *(I, 3)* Fundamentals of the personal selling process with emphasis on sales theory, selling techniques, and the salesperson's role in the marketing process. *(Lec. 3) Pre: 301.* Staff

405 Marketing Communications *(I, 2)* 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. 4 for one-half semester; independent work required) Pre: 301 or permission of instructor.* Staff

406 Product Management *(I, 2)* Development of product policies and strategies in a competitive environment. Emphasis on organ-

ization of the product management function, planning and developing new products, adjusting product strategies, and deleting products. *(Lec. 4 for one-half semester; independent work required) Pre: 301 or permission of instructor.* Staff

407 Channels of Distribution *(II, 2)* 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. 4 for one-half semester; independent work required) Pre: 301 or permission of instructor.* Staff

408 Pricing Decisions *(II, 2)* 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. 4 for one-half semester; independent work required) Pre: 301 or permission of instructor.* Staff

409 Marketing Policy and Problems *(II, 3)* Summary course, emphasis on decision-making in all marketing areas and on use of the case method. *(Lec. 3) Pre: 301 and senior standing.* Staff

415 Marketing Research *(II, 3)* Nature, scope, and applications of marketing and advertising research. *(Lec. 3) Pre: MGS 202, MKT 301.* Staff

416 Quantitative Marketing Management *(II, 3)* Quantitative techniques and analytical models in marketing management. Selected models are explored emphasizing formulation and requirements for application to marketing problems. *(Lec. 3) Pre: MGS 202 or equivalent, MKT 301.* 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.* Staff

442 Sales Management *(II, 3)* Planning, organization, and control of sales operations. Emphasis is placed upon the sales manager's functions and problems. Cases. *(Lec. 3) Pre: 301, 341 or permission of instructor.* Staff

446 Industrial Marketing *(I, 3)* Nature and analysis of industrial markets and their potential. Strategic planning, product policy, channel, price, and promotion mix decisions by the industrial marketer. Procurement and organization buying behavior. Cases. *(Lec. 3) Pre: 301.* Staff

451 International Marketing *(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.* Staff

491, 492 Directed Study *(I and II, 1-3 each)* Independent study supervised by department faculty. Seminar meetings concerned with specific marketing topics. *Pre: permission of department.* Staff

493 Internship in Marketing *(I or II, 3)* Approved, supervised work experience with participation in management and problem solving related to MKT. Fifteen working days (or 120 hours). *Pre: junior standing and proposal approved by the College of Business Administration. May be repeated once for credit. Not for graduate credit. S/U only.* Staff

501 Marketing Theory and Practice *(I and II, 2)*

Mathematics (MTH)

Chairperson: Professor Montgomery

107 Introduction to Finite Mathematics *(I and II, 3)* Concepts and processes of modern mathematics concerned with logic, sets, and the theory of probability. Role of these concepts in the social and physical sciences of today. *(Lec. 3) Not open to mathematics majors except for mathematics education students.* Staff (M)

108 Topics in Mathematics *(I and II, 3)* Introduces the non-mathematics 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) Not open to mathematics majors except for mathematics education students.* Staff (M)

109 Algebra and Trigonometry *(I and II, 3)* Real numbers, notation, and operations of algebra, introduction to elementary functions (polynomial, rational, exponential, and trigonometric). Designed for students who have only had one year of high school algebra. *(Lec. 3) Not open to mathematics majors nor to students who have had calculus in high school or college, except by permission of department chairperson.* 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) Not for credit for majors in mathematics.* Staff (M)

141 Introductory Calculus with Analytic Geometry *(I and II, 3)* 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) It is recomended that students electing 141 have completed four units of high school mathematics including trigonometry.* Staff (M)

141L Introductory Calculus Problem Solving Laboratory *(I and II, 1)* Problem-solving sessions to accompany 141. Topics include analytic geometry, derivatives, maxima and minima, rate of change, antidifferentiation, area, volume, arc length. Emphasis on application to physics and engineering problems. *(Lab. 2) Pre: concurrent or prior registration in 141.* Staff

142 Intermediate Calculus with Analytic Geometry *(I and II, 3)* 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) Pre: 141 or equivalent.* Staff (M)

143 Computer Laboratory in Calculus *(I and II, 1)* Illustration of some concepts of elementary calculus using computer; use of computer in some applications of calculus. Students will write simple programs. No previous computer or programming experience required. *(Lab. 2) Pre: prior or concurrent registration in 141.* Staff

215 Introduction to Linear Algebra *(I, 3)* Detailed study of finite dimensional vector spaces, linear transformations, matrices, determinants and systems of linear equations. *(Lec. 3) Pre: 142 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 all the physical sciences. Basic for further study in applied mathematics and for advanced work in physics and engineering. *(Lec. 3) Pre: 243.* 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.* Staff

322 Concepts of Geometry *(II, 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: 141 or equivalent.* Staff

361 Mathematics Methods for Scientists and Engineers *(I, 3)* Introduction to differential equations and difference equations including Laplace transform and Z-transform. Func-

tions of several variables, Lagrange multipliers, calculus of variations. *(Lec. 3) Pre: 243.* 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) Not for major credit in mathematics. Pre: 243.* 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) Not for major credit in mathematics. Pre: 362 or equivalent.* 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. *Pre: permission of department.* 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.* Staff

425 Topology *(I, 3)* Abstract topological spaces and continuous functions. Generalizations of some classical theorems of analysis. *(Lec. 3) Pre: 243 or equivalent.* 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: 243.* 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.* 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. Non-homogeneous boundary value problems. Green's functions. *(Lec. 3) Pre: 244 or 361.* 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 361 or 362.* 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 engineering or consent 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 361 or 362.* 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 member of the staff and arranged to suit the individual requirements of the student. *Pre: permission of department.* Staff

513 Linear Algebra *(I or II, 3)*
515, 516 Algebra I, II *(I and II, 3 each)*
525 Topology I *(I, 3)*
535, 536 Measure Theory and Integration *(I and II, 3 each)*
545, 546 Ordinary Differential Equations I, II *(I and II, 3 each)*
547 (or CSC 547) Combinatorics and Graph Theory *(I, 3)*
548 Topics in Combinatorics *(II, 3)*
550 Probability and Stochastic Processes *(I, 3)*
551 Mathematical Statistics *(I, 3)*
561 Advanced Applied Mathematics *(II, 3)*
562 Complex Function Theory *(I, 3)*
572 Numerical Analysis *(II, 3)*
591, 592 Special Problems *(I and II, 1-3 each)*

Mechanical Engineering and Applied Mechanics (MCE)

Chairperson: Professor T.J. Kim

162 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 developed. *(Lec. 3) Pre: MTH 141.* Staff

220 Computer Graphics in Mechanical Engineering *(I, 1)* Introduction to computer-aided design and drafting using both mainframe and microcomputer systems and commercially available professional software. Computer-assisted problem solving including

mainframe operating systems, FORTRAN, and plotting. *(Lab. 3) Pre: CSC 201, MTH 142.* Reuber and Olson

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: 162.* Staff

317, 318 Mechanical Engineering Experimentation I and II *(I and II, 3 each)* An integrated laboratory sequence for the junior and senior years; static and dynamic characteristics of instruments, calibration, experimental error propagation, planning of experiments from dimensional and error considerations, and a broad range of laboratory experiments in mechanical engineering. *Pre: CSC 201, CVE 220, MCE 341 or equivalent for 317; 317 for 318.* Hagist and Shukla

323 Kinematics *(I, 3)* Analysis of mechanisms by analytical and related graphical methods; linkages, cams, gears, gear trains, differential mechanisms, escapements, computing, and miscellaneous mechanisms; vector methods including complex exponential representation of a vector in a plane. *(Lec. 3) Pre: EGR 102, CSC 201, MCE 263.* Datseris and Olson

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. Thermodynamic diagrams and processes. *(Lec. 3) Pre: 263, MTH 243, credit or registration in PHY 341.* Brown, DeLuise, Test, and Henderson

342 Mechanical Engineering Thermodynamics *(I and II; 3)* Continuation of 341 including mixtures of gases and vapors, topics of gas dynamics and chemical thermodynamics, applications of thermodynamics to power cycles and refrigeration processes. *(Lec. 3) Pre: 341 and CSC 201.* Brown, DeLuise, Test, and Wilson

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 non-viscous fluids including boundary layer flows, flows in closed conduits and around immersed bodies. *(Lec. 3) Pre: 263, CSC 201, and MTH 244 or 461.* Hagist, Lessmann, and White

366 Introduction to Systems Engineering *(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, CSC 201, and MTH 244 or permission of instructor.* Palm

372 Engineering Analysis I *(I, 3)* Application of advanced mathematical methods to solution of mechanical engineering problems with emphasis on the techniques of engineering analysis. *(Lec. 3) Pre: CSC 201 and MTH 244, junior standing.* Lessmann and Sadd

373 Engineering Analysis II *(II, 3)* Continuation of 372. *(Lec. 3) Pre: 372.* Lessmann and Sadd

391, 392 Honors Work *(I and II, 1-3 each)* Independent study under faculty supervision for honors students. *Pre: admission to departmental honors program.* Staff

401 (or OCE 401) Introduction to Ocean Engineering Systems I *(I, 3)* Basic ocean engineering principles with emphasis on mechanics, thermodynamics and fluid-flow applications. Motion and equilibrium under the action of ocean forces. Propulsion, structure, and corrosion aspects. *(Lec. 3) Pre: 341 and 354, or permission of instructor. Not for graduate degree program credit.* Kowalski

402 (or OCE 402) Introduction to Ocean Engineering Systems II *(II, 3)* Continuation of 401. Flow of fluids in ocean systems. Psychrometry and mass transfer in pressurized environments. Human response to pressure. Design aspects of diving systems. Integrated system studies. *(Lec. 3) Pre: 401. Not for graduate degree program credit.* White

406 Atmospheric Physics I
See Physics 406.

407 Atmospheric Physics II
See Physics 407.

410 (or OCE 410) Basic Ocean Measurements *(I or II, 3)* Four or five basic ocean measuring exercises: current and tide, dissolved oxygen, wave frequency spectra, soil characeristics from cores, water depth, and bottom profiles. *(Lec. 1, Lab. 6) Pre: senior standing in engineering or permission of instructor. Not for graduate degree program credit.* Middleton

423 Design of Machine Elements *(I, 3)* Design of machinery involving strength of materials, adequacy of design, factor of safety, stress concentration, fatigue, creep, power transmission devices, gears, springs, shafts, fasteners, ball bearing reliability, associated computer methods. *(Lec. 3) Pre: 317, 323, 372, CHE 333, and CVE 220.* Nash

424 Dynamics of Machines *(I, 3)* The forces in machinery, including linkages, intermittent motions, trains of mechanism, static, inertia and combined forces, balancing, critical speeds and gyroscopic effects. *(Lec. 3) Pre: 323, MTH 244.* Datseris

425 Lubrication and Bearings *(I, 3)* Theory of hydrodynamic lubrication and bearing design, chemical aspects of lubricants and additives, bearing metals and their surface properties, friction and wear. *(Lec. 3) Pre: 354.* Ghonem

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. *Pre: CVE 220.* Ghonem and Shukla

428 Mechanical Control Systems *(I, 3)* Analysis of mechanical, electromechanical, hydraulic, pneumatic, and thermal control systems. Computer-aided design methods. Digital control. *(Lec. 3) Pre: 366 or equivalent.* Palm

429 Comprehensive Design *(II, 3)* Creative design of engineering systems including socio-economic and ecological considerations, design, and analysis projects. Advanced topics in design, reliability and probability considerations, optimum design, case studies, associated computer methods. *(Lec. 3) Pre: 423.* Nash

430 Computer-Aided Design *(I or II, 3)* Constructive solid geometric modeling of 3-D objects, simulation of kinematics and dynamics of mechanisms. Mechanism design for various kinematic and dynamic requirements. Stress analysis and design of mechanical devices. *(Lec. 3) Pre: CSC 201, MCE 323, CVE 220.* Datseris and Reuber

431 Computer Control of Mechanical Systems *(II, 3)* Integrated study of hardware and software aspects of microcomputer-based systems with emphasis on interfacing to external hardware for on-line measurement, data acquisition, and control of mechanical systems. *Pre: CSC 201 and MCE 366.* Palm

432 Alternate Energy Systems *(I, 3)* Topics include energy availability and analysis of conversion systems such as MHD, fuel cells, wind and ocean power, and solar-generated electricity. *(Lec. 3) Pre: 342, 354, PHY 341.* Lessmann

434 Thermal Environmental Engineering *(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: 342, 354, 448.* Test, Lessman, and Henderson

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: 342.* Brown

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: 342 and 448 or permission of instructor.* Brown

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: CVE 220, MCE 317 or permission of instructor.* Shukla

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.* White, Faghri, and Henderson

449 Product Design for Manufacturability 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.* Hagist, Lessmann, and White

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.* Nash

465 Experimental Mechanics *(1, 3)* Theory and application of various experimental techniques used in solid mechanics such as acoustic emission, holography, interferometry, strain gages, brittle coatings, and photoelasticity. *(Lec. 2, Lab. 3) Pre: CVE 220, MCE 317.* 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. *Pre: CVE 220 and MCE 373.* Sadd and Kim

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. *(Lec. and Lab. according to nature of problem) Credits not to exceed total of 12. Pre: permission of department.* Staff

503 (or ELE 503) Linear Control Theory *(I or II, 3)*
504 (or ELE 504) Optimal Control Theory *(II, 3)*
505 Optimization in Mechanical Engineering Design *(I or II, 3)*
521 Reliability Analysis and Prediction *(II, 3)*
523 Advanced Kinematic Analysis *(I, 3)*
524 Advanced Kinematic Synthesis *(I, 3)*
540 (or OCE 540) Environmental Control in Ocean Engineering *(II, 3)*
541, 542 Advanced Thermodynamics I and II *(I and II, 3 each)*
545 Heat Transfer *(I, 3)*
546 Convection Heat Transfer *(II, 3)*
550 Theory of Continuous Media *(I, 3)*
551 Fluid Mechanics I *(I, 3)*
552 Fluid Mechanics II *(II, 3)*
553 Fluid Mechanics III *(I, 3)*
561 Computational Methods in Solid Mechanics *(I or II, 3)*
562 Computational Methods in Fluid Flow and Heat Transfer *(I or II, 3)*
563 Advanced Dynamics *(I and II, 3)*
564 Advanced Vibrations *(I, 3)*
565 Wave Motion and Vibration of Continuous Media *(II, 3)*
566 The Mechanics of Robot Manipulators *(I or II, 3)*
571 Theory of Elasticity I *(I, 3)*
572 Theory of Elasticity II *(II, 3)*
576 Fracture Mechanics *(II, 3)*
582 (or CSC 582 or ELE 582) Robotics *(I or II, 3)*

Medical Technology (MTC)

Coordinator: G. Paquette

102 Introduction to Medical Technology *(II, 1)* An orientation to medical technology including specialty areas of medical laboratory sciences, professional organizations, credentialing, the team concept and professionalism. *(Lec. 1)* Paquette

202 Introduction to Clinical Laboratory Methods *(II, 3)* Introduction to fundamental methods used in clinical laboratory science. Supervised training at URI Health Services Laboratory. *(Lec. 2, Lab. 3) Pre: MIC 211 (may be taken concurrently), CHM 228 and permission of instructor.* Paquette

The clinical courses in Medical Technology (MTC 401-407) require senior standing and are available only to students who have been accepted into an affiliated Hospital School of Medical Technology.

401 Clinical Microbiology *(I, 8)* 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. Hospital Staff

402 Clinical Chemistry *(II, 8)* The chemistry of body constituents and their relationship to diagnosis of human disease. Principles and methods of analysis are emphasized. Hospital Staff

403 Immunohematology *(I, 4)* Instruction in drawing and processing blood and in ascertaining compatibility. Donor-recipient blood and tissue reactions are studied in detail. Hospital Staff

404 Hematology *(II, 6)* 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. Hospital Staff

405 Pathophysiology *(I, 2)* An introduction to pathology. The correlation between pathological processes and clinical symptoms and the course of disease is studied. 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. Hospital Staff

407 Clinical Microscopy *(I, 2)* Lectures and laboratory practice in the analyses of body fluids. Hospital Staff

483 Introductory Diagnostic Microbiology See Microbiology 483.

501 or (MIC 501) Advanced Clinical Microbiology *(I or II, 3)*
502 Advanced Clinical Chemistry for Medical Technology *(I or II, 3)*
503 Advanced Hemostasis and Coagulation *(I or II, 3)*
510 Clinical Laboratory Supervision *(I or II, 3)*
512 Special Problems in Clinical Laboratory Science *(I or II, 3-6)*
513 (or MIC 513) Advanced Clinical Immunology *(I or II, 3)*
515 (or MIC 515) Infectious Diseases *(I or II, 3)*
520 Advanced Hematology I *(I or II, 3)*
521 Advanced Hematology II *(I or II, 3)*
530 Advanced Immunohematology I *(I or II, 3)*
531 Advanced Immunohematology II *(I or II, 3)*
532 Clinical Endocrinology *(I or II, 3)*
541 Advanced Clinical Microbiology II *(I or II, 3)*
543 Advanced Clinical Chemistry II *(I, II or SS, 3)*

Medicinal Chemistry (MCH)

Chairperson: Professor J. E. Abushanab

342 Pharmaceutical Analysis *(I and II, 3)* Principles and techniques of official and non-official procedures for the quantitative assay

and qualitative control of drugs and pharmaceutical necessities. *(Lec. 2, Lab. 3) Pre: third-year standing and permission of department.* Smith

344 (or PCL 344) Principles of Medicinal Chemistry and Pharmacology *(II, 3)* Chemical, physico-chemical and biomolecular principles affecting drug delivery and action including biotransformation, isosteres, as well as radiopharmaceutical principles. *Pre: third-year standing or permission of instructor.* Panzica, DeFeo, and Smith

355 Drug Analysis *(SS, 4)* Quantitative and qualitative analyses of drug molecules via fundamental, instrumental, and functional group methods including characterization of structural features and reactivity relationships. *(Lec. 3, Lab. 3) Pre: 342 or permission of department.* Smith

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: CHM 228, MCH 342, MCH (or PCL) 344, and/or permission of instructor.* Abushanab, Panzica, and Turcotte

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. *(Lab. 3-15) Pre: permission of department.* Staff

501 Radiopharmaceuticals *(I, 3)*
526 (or FSN 526) Lipid Chemistry *(I, 3)*
548 (or PCG 548) Physical Methods of Identification *(II, 3)*
549 Synthesis *(I and II, 3)*

Microbiology (MIC)

Chairperson: Professor D.C. Laux

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: 1 semester of biology and 1 year of chemistry. Not open to students who have had 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: 2 semesters of biology, 1 semester of organic chemistry (can be taken concurrently). Not open to students who have had 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. 2, Lab. 3) Pre: 201 or 211.* Laux

401 Quantitative Cell Culture
See Biochemistry and Biophysics 401.

403 Introduction to Electron Microscopy
See Biochemistry and Biophysics 403.

405 (or BCP 405) Electron Microscopy Laboratory *(I, 2)* Introduction to the practical aspects of electron microscopy. Emphasis on acquisition of the following skills: tissue preparation, ultra-microtomy, operations of the electron microscope, and darkroom procedures. *(Lab. 6) Pre: prior or concurrent enrollment in 403 and permission of instructor.* Hufnagel

410 Molecular Genetics of the Protozoa *(II, 3)* Genetic inheritance in various ciliates and flagellates, including *Paramecium, Tetrahymena, Chlamydomonas.* Biochemical and ultrastructural approaches to chromosome structure and function, gene regulation, expression of cell surface antigens, mating interactions. *(Lec. 3) Pre: BOT 352 or permission of instructor. In alternate years, next offered spring 1990.* 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 I semester of biochemistry (may be taken concurrently.)* Wood

413 Advanced Microbiology Lecture I *(I, 3)* The physiology, genetics, developmental, and molecular biology of microorganisms. *(Lec. 3) Pre: 211, prior or concurrent registration in BCP 311 and BOT 352, or permission of instructor.* Cohen, Nelson, and Cabelli

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, prior or concurrent registration in BCP 311, or premission of instructor.* Nelson, 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: 413 taken concurrently or permission of instructor.* Cohen, Nelson, Cabelli

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: 414 taken concurrently or permission of instructor.* Hufnagel, Nelson

421 Cell Biology and Cancer
See Biochemistry and Biophysics 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 1 semester of organic chemistry.* Sperry

453 Cell Biology
See Botany 453.

483 (or MTC 483) Introductory Diagnostic Microbiology *(I, 3)* Supervised practical experience and training in clinical microbiology conducted at URI Health Services *(Lec. 2, Lab. 3) Pre: 432 (may be taken concurrently) and approval 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. *(Lab. 2 to 12) Open only to seniors in the microbiology curriculum. A maximum of 6 credits is allowed for major credit.* Staff

495, 496 Seminar in Microbiology *(I and II, 1 each)* Preparation and presentation of papers on selected subject in microbiology. *(Lec. 1) Pre: permission of department. S/U credit.* Staff

501 (or MTC 501) Advanced Clinical Microbiology *(I or II, 3)*
503 (or BCP 503) Electron Microscopy *(I, 2)*
505 (or BCP 505) Laboratory in Electron Microscopy *(I, 3)*
510 (or ZOO 510) Cell and Developmental Biology of the Ciliated Protozoa *(II, 2)*
513 (or MTC 513) Advanced Clinical Immunology *(I or II, 3)*
514 The Electron Microscope in Molecular and Cellular Biology *(II, 2)*
515 (or MTC 515) Infectious Diseases *(I or II, 3)*
521 (or BOT 521 or ZOO 521) Recent Advances in Cell Biology *(I, 1)*
523 Water Pollution Microbiology *(I, 3)*
525 (or FSN 525) Water Pollution Microbiology Laboratory *(I, 1)*
533 Immunity and Serology *(II, 3)*
534 (or ASP 534) Animal Virology *(I, 3)*
536 (or ASP 536) Virology Laboratory *(I, 2)*
538 (or ASP 538) Epidemiology of Viral and Rickettsial Diseases *(II, 2)*
541 (or MTC 541) Advanced Clinical Microbiology II *(I or II, 3)*
552 Microbial Genetics *(II, 3)*
561 Recent Advances in Molecular Cloning *(I or II, 1)*
576 (or OCG 576) Marine Microbiology *(I, 3)*
593, 594 The Literature of Bacteriology *(I and II, 1 each)*

Note: For Mycology, see Botany.

Military Science (MSC) (Army ROTC)

Chairperson: Professor Davis

100 Introduction to Leadership *(I, and II, 1)* Develops leadership ability by placing students in challenging situations which require quick judgments, decisions, and teamwork. Includes leadership theory, rappelling, water survival, and cold weather operations. *(Lab. 2) This course is mandatory for entrance into the advanced ROTC course.* Staff

105 Beginner Weight Training and Conditioning
See Physical Education 105W.

107 Orienteering *(I and II, 1)* Introduction to orienteering, to include map reading, compass use, and cross-country land navigation. Students will have the opportunity to complete a land navigation course. *(Lab. 2)* Lexvold

109 Wilderness Survival *(I and II, 1)* Introduction to basic wilderness survival to include food, water, and shelter acquisition. Includes hasty land navigation techniques over water and hazardous terrain, cold and hot weather injury prevention, and introductory water survival. Nichols

170 History of Modern Warfare *(I, 3)* Study of warfare with emphasis on the period since the introduction of gunpowder. Influence of social systems, economics, leaders, and the major battles on warfare will be explored. *(Lec. 3)* Lexvold

180 The American Military and Society *(II, 3)* A look at how society and the military interact. Examination of the historical development of the military, the military industrial complex, military justice, race relations, drug abuse. *(Lec. 3)* Lexvold

205 Intermediate Weight Training and Conditioning
See Physical Education 205W.

260 Comparative Military Systems *(II, 3)* In-depth look at the military systems of the U.S., U.S.S.R., and the People's Republic of China. Exploration of manpower sources, training, equipment, education, social position, mission, and strategy. *(Lec. 3)* LeNoir

270 Studies in Military Leadership *(I, 3)* Analysis of historical and contemporary case studies in military leadership. Evaluation of basic principles influencing these cases. *(Lec. 3)* LeNoir

310, 320 Leadership and Management *(I and II, 2 each)* Advanced courses: application of the principles of war, small unit tactics, leadership development, planning and execution of tactical problems. *(Lec. 2) Pre: permission of department and successful completion of basic courses, or completion of basic camp or equivalent; for 320, 310.* Lawson

330, 340 Organizational Management and Law *(I and II, 3 each)* Advanced courses; military law, 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, Lab. 2) Pre: permission of department; for 330, 320; for 340, 310.* Davis

Music (MUS)

Chairperson: Professor Keeling

050 Performance Preparatory *(I and II, 0)* Class or private instruction.* Select appropriate letter and voice or instrument from the list under 251 below and add to course number, as 050E Violin. May be repeated for a second semester if work of the first is satisfactory. *(Lec. 1) S/U only.* Staff

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) Proficiency test available.* Ceo (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. Pollart (A)

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)* Ergas (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, sight singing, and part writing. *(Lec. 3) (Pre: 111 or permission of instructor. Not for major credit in music.* Staff

113, 114 Diatonic Harmony and Ear Training *(I and II, 4 each) 113:* Rhythmic, melodic, and harmonic elements of music. Scales, intervals, and the chord structure. Sight-singing, rhythmic articulation, and melodic dictation. Part-writing, analysis, keyboard work, and harmonic dictation involving primary triads. *(Lec. 3, Lab. 2) Proficiency test available. Pre: concurrent or previous keyboard experience. 114: Continuation, covering all diatonic triads, dominant and supertonic seventh chords, and modulation to closely related keys. (Lec. 3, Lab. 2) Proficiency test available. Pre: 113.* Dempsey and Rankin

117 Applied Composition *(I and II, 1)* Private study in composition for students interested in original work in contemporary idioms. Emphasis on mastery of the basic craft and individual creative expression. May be repeated once for credit. *(Lec. 1) Pre: determined by audition.* Gibbs

169 Percussion Instruments Class *(II, 1)* Basic principles in performance and pedagogy of percussion instruments. *(Lab. 2) Proficiency test available. Open only to students in the music education curriculum. In alternate years. Next offered fall 1989.* Pollart

170 Guitar for the Classroom Music Teacher *(I, 1)* Development of the basic principles and pedagogy for use of guitar in the music classroom. *(Lec. 1) Proficiency test available. Registration limited to music education majors.* Fraioli

171, 172 Piano Class *(I and II, 1 each)* Development of basic techniques and musicianship for effective use of the piano in music classrooms. *(Lab. 2) Proficiency test available. Pre: 113 or concurrent registration in 113 for 171; 171 for 172.* Fuchs

173, 174 Voice Class *(I and II, 1 each)* Basic principles and pedagogy of singing, physiology, breathing, tone production, diction. *(Lab. 2) Proficiency test available. Pre: 173 for 174. Open only to students in the music education curriculum. In alternate years, next offered 1988-89.* Langdon

175, 176 String Instruments *(I and II, 1 each)* Basic principles in performance and pedagogy of violin or viola and violoncello or bass viol. *(Lab. 2) Proficiency test available. Pre: 175 for 176. Open only to students in the music education curriculum. In alternate years, next offered 1989-90.* Dempsey and Trexler

177, 178 Woodwind Instruments Class *(I and II, 1 each)* Basic principles in performance and pedagogy of woodwind instruments, with emphasis on clarinet and flute. *(Lab. 2) Proficiency test available. Pre: 177 for 178. Open only to students in the music education curriculum. In alternate years, next offered 1988-89.* Staff

179, 180 Brass Instruments Class *(I and II, 1 each)* Basic principles in performance and pedagogy of trumpet, French horn, baritone, trombone, and tuba. *(Lab. 2) Proficiency test available. Pre: 179 for 180. Open only to students in the music education curriculum. In alternate years, next offered 1989-90.* Staff

181, 182 Intermediate Piano Class *(I and II, 1 each)* Further development of basic keyboard performance. Improvised accompaniments to folk songs. Sight transposition. Some score reading. Further development of reading skills using materials on the level of Bartok: Mikrokosmos, Books 2 and 3, and Clementi: Sonatinas, Op. 36. Registrants must also take any part of the piano proficiency examination not previously passed. *(Lab. 2) Proficiency test*

*See p. 21 for the applied music fee associated with this course

available. Open only to students in the music education curriculum. Pre: 172 for 181; 181 for 182. Fuchs

208 Jazz Improvisation I *(I, 3)* An intensive study and practice of the formal elements of jazz improvisations. *(Lec. 1, Lab 4) Pre: 114 and acceptance into a 200-level performance course.* Staff

215, 216 Advanced Harmony and Ear Training *(I and II, 3 each) 215:* Advanced rhythmic, melodic, and harmonic practice approached through sight singing, dictation, analysis, keyboard work, and part writing including original work. Covers all seventh chords, chromatic alteration, chromatic progression, and foreign modulation. *(Lec. 2, Lab. 2) Proficiency test available. Pre: 114 or equivalent. 216:* Continuation, covering ninth, eleventh, and thirteenth chords; melodic elaboration. Introduction to contrapuntal textures and contemporary idioms. *(Lec. 2, Lab. 2) Proficiency test available. Pre: 215.* Gibbs

221, 222 History of Music *(I and II, 3 each) 221:* Development of music primarily in Western culture from Ancient times through the Middle Ages, Renaissance and the Baroque periods. *222:* Continuation to include the Rococo, Classical, Romantic, and Modern eras. *(Lec. 3) Pre: 101 or placement exam and 113.* Staff

231 Performance as Elective *(I and II, 2)* One 40-minute lesson each week. Concurrent ensemble registration as appropriate. *(Studio 40 min.) May be repeated for credit. See under 251 for areas of study. Pre: Level of competence equivalent to 251.* Staff

241 Performance in Piano for Theory-Composition Majors *(I and II, 2)* Reading scores at the piano and using the piano as a tool for composing or theoretical study and teaching. Private instruction. Four semesters. *(Studio 40 min.) Pre: 182 or equivalent.* Staff

242 Performance in Piano for Voice Majors *(I and II, 2)* Reading as an adjunct skill for teaching voice, conducting choirs, or familiarizing oneself with the sound of accompaniment. Private instruction. Four semesters. *Not open to students with credit for 251B (Studio 40 min.) Pre: 182 or equivalent.* Staff

250 Recital Laboratory *(I and II, 0)* Study of repertory and techniques of concert presentation through attending student recitals and presentations by faculty and visiting artists. Attendance at 75% of events required. *May be repeated. S/U credit.* Staff

251 Performance as Minor *(I or II, 2)* Lower division. One private 60-minute lesson each week.* Two levels; one per year as prescribed in syllabi. Recital performances as required by department and instructor. *(Studio 60 min.) May be repeated for credit. Pre: audition. Requirements for each instrument available from department.* Staff

Select area of instruction from the following and add to course number as 251B, Piano:

A Voice	I Viola d'amore	R Trombone
B Piano	J Flute	S Baritone Horn
C Organ	K Oboe	
D Harpsichord	L Clarinet	T Tuba
E Violin	M Bassoon	U Percussion
F Viola	N Saxophone	V Guitar
G Violoncello	P Trumpet	W Harp
H Bass Viol	Q French Horn	Y Recorder

261 Performance Major *(I and II, 3)* Lower division. One private 60-minute lesson each week.* Two levels, one per year, as prescribed in syllabi. Recital performances as required by department and instructor. *(Studio 60 min.) May be repeated. Pre: audition. Requirements for each instrument available from department. See under 251 for areas of study.* Staff

290 University Symphony Orchestra *(I and II, 1)* Audition required. *(Rehearsal 3) May be repeated.* Ceo

291 University Marching Band *(I, 2)* Preparation of music, maneuvers, and shows for homes and away football games. *(Rehearsal 6) Only one of the two credits for this course applies toward the bachelor of music degree requirements. May be repeated.* Pollart

292 Concert Band *(II, 1)* Study and performance of concert band music. Open to all students by audition. *(Rehearsal 2) Pre: audition. May be repeated.* Pollart

293 University Chorus *(I and II, 1)* Audition required. *(Rehearsal 3) May be repeated.* Kent

294 Symphonic Wind Ensemble *(II, 1)* Audition required. *(Rehearsal 3) May be repeated.* Pollart

295 Concert Choir *(I and II, 1)* Audition required. *(Rehearsal 3) May be repeated.* Kent

296 Jazz and Studio Ensemble *(I and II, 1)* Performance and study of jazz and studio music as related to professional experiences. *(Rehearsal 3) Pre: audition.* Motycka

297 University Chamber Orchestra *(I and II, 1)* An ensemble which offers the study and performance of standard and modern repertoire for the smaller orchestral group. Literature will be selected from the Baroque, Rococo, Classic and contemporary periods. *(Rehearsal 3) Pre: all prospective members will be selected by audition. String players must be members of the University Orchestra, while others may qualify with permission of the conductor. Music majors will be given preference for admission. May be repeated.* Ceo

299 Chamber Music Ensembles *(I and II, 1)* Chamber music ensembles are designated as A Keyboard Ensemble, B String Ensemble, C Woodwind Ensemble, D Brass Ensemble, E Percussion Ensemble, G Madrigal Singers, H Guitar Ensemble, J Saxophone Ensemble, M Jazz Combo. Select appropriate letter and small ensemble from list and add to course number, as 399B String Ensemble. Other ensemble combinations may be added. Small instrumental ensembles are normally restricted to one performer per part. Audition required. *(Rehearsal 2) May be repeated.* Staff

306 Composing and Arranging for Jazz Ensemble *(I, 3)* Modern and traditional jazz arranging and compositional techniques, with emphasis on solo and concerted ensemble writing, voicing techniques and mechanics of line writing; unique composing styles of recognized jazz composers. *(Lec. 3) Pre: 215.* Staff

311, 312 Conducting *(I and II, 2 each) 311:* Choral conducting. Special techniques for direction and rehearsal of choral groups. Problems of tone, diction and balance; organization of school, church, community and professional groups. Analysis of major choral works from conductor's standpoint. *(Lec. 2) Pre: previous or concurrent registration in 215.* Kent. *312:* Instrumental conducting. Problems of conductor; score reading, interpretation, techniques of rehearsal and direction. *(Lec. 2) Pre: previous or concurrent registration in 215.* Keeling

317 Form and Analysis *(I, 3)* Critical study of musical structure. Works of various composers are analyzed with reference to motive and phrase as generative elements in design. *(Lec. 3) Pre: 216.* Gibbs

321 Orchestration *(II, 3)* Range, timbre, transpositions, and other characteristics of the instruments of the orchestra, singly and in combination. Exercises in writing for choirs of the orchestra and for full orchestra. Setting of one of small homophonic forms of full orchestra required. *(Lec. 3) Pre: Prior or concurrent registration in 216. In alternate years, next offered in spring 1989.* Gibbs

329 (or EDC 329) Music for the Elementary School Teacher *(I and 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 GTE students.* Staff

339 Vocal Methods and Materials *(I, 3)* Organization of the vocal music program in the elementary and secondary school with emphasis on method and introduction to material. *(Lec. 3) Pre: junior standing in music.* Staff

340 Instrumental Methods and Materials *(II, 3)* Organization of instrumental music program in the elementary and secondary school with emphasis on method and introduction of materials. *(Lec. 3) Pre: junior standing in music.* Pollart

345, 346 Honors Project *(I and II, 1-3 each)* Independent study under faculty supervision

*See p. 21 for the applied music fee associated with this course

for honors students. *Pre: departmental approval of admission to honors program and acceptance of project by a member of the staff.* Staff

390 Piano Accompanying *(I and II, 1)* Development of sightreading skills. Preparation and performance of accompaniments. *(Lec. 1) Pre: permission of piano faculty. May be repeated.* Fuchs or Rankin

407 The Symphony *(II, 3)* Survey of the development of the symphony from its beginnings in the mid-eighteenth century to the present. Includes a study of the evolution of the orchestra and the sonata form and considers cultural influences exerted upon the composers. *(Lec. 3) Pre: 222. In alternate years, next offered spring 1989.* Staff

408 The Opera *(I, 3)* History of the opera from its beginning in Florence at the turn of the seventeenth century to the present. *(Lec. 3) Pre: 221, 222. In alternate years, next offered fall 1988.* Ladewig

418 Composition *(II, 3)* Original work in small binary, ternary, variation, and sonatina forms for various instrumental and vocal groups. *(Lec. 3) Pre: prior or concurrent registration in 216. In alternate years, next offered spring 1990.* Gibbs

419 Composition *(I, 2)* Continuation of 418, stressing original composition in larger forms and study of twentieth-century techniques. *(Lec. 2) Pre: 418. In alternate years, next offered fall 1989.* Gibbs

420 Counterpoint *(II, 3)* Systematic study of motive manipulation with reference to traditional contrapuntal devices. Emphasis on harmonic counterpoint of late Baroque, more recent practices considered. Creative work in canon, invention, fugue, and chorale-prelude. *(Lec. 3) Pre: prior or concurrent registration in 317. In alternate years, next offered spring 1989.* Ladewig

422 Advanced Orchestration *(II, 2)* Continuation of 321, emphasizing score reading and orchestrational styles. Transcription for orchestra of a major keyboard work required as a semester project. *(Lec. 2) Pre: 321. In alternate years, next offered spring 1990.* Gibbs

423 Sixteenth-Century Counterpoint *(II, 3)* Modal polyphony based on the style of Palestrina and his contemporaries, covering *cantus firmus* techniques, imitation and various other contrapuntal devices in textures from two to four or more voices. *(Lec. 3) Pre: 216. In alternate years, next offered spring 1990.* Ladewig

430 The Renaissance Period *(I, 3)* Music of the period (ca. 1400-1630) from Dunstable and Dufay to Palestrina and Monteverdi, covering the polyphonic mass, motet, chanson, madrigal, lied, ricercar, canzona, dance, variation, and related genres. *(Lec. 3) Pre: 221 and 222. In alternate years, next offered fall 1988.* Staff

431 The Baroque Era *(I, 3)* Music of the so-called thorough-bass period (ca. 1600-1750) includes the emergence of opera and oratorio, autonomous instrumental music and the concerto style, culminating in works of Bach and Handel. *(Lec. 3) Pre: 221, 222. In alternate years, next offered fall 1989.* Staff

432 The Classic Era *(II, 3)* Music of the period (ca. 1725-1815) beginning with the decorative gallant style of the Rococo composers and culminating in the expressive architectonic textures in the works of Haydn, Mozart and early Beethoven. *(Lec. 3) Pre: 221, 222. In alternate years, next offered spring 1990.* Staff

433 The Romantic Era *(I, 3)* Music of the nineteenth century within the context of the Romantic movement (1815-1875). Major composers and their works in various media are considered with respect to their historical significance. *(Lec. 3) Pre: 221, 222. In alternate years, next offered fall 1989.* Ladewig

434 The Modern Era *(I, 3)* Music of the twentieth century with emphasis on changing aesthetics as revealed through the analysis of selected composition. *(Lec. 3) Pre: 221, 222. In alternate years, next offered fall 1988.* Gibbs

438 Topics in Elementary School Music *(II, 3)* Open-ended course examining significant materials, approaches, and current trends. Topics cover such areas as aesthetic education, process of musical development, eurythmics, Orff and Kodaly or an overview. *May be repeated with credit with change of topic. Pre: MUS (EDC) 329, 339 or equivalent. In alternate years, next offered spring 1989.* Staff

441 Special Projects *(I and II, 3)* Advanced work in research or of a creative nature in the field of history, literature, theory, composition, and education. Advisory basis; permission of department and instructor required for registration. *Pre: completion of the most advanced undergraduate course in the field. May be repeated once.* Staff

442 Directed Study in Applied Music Pedagogy *(I and II, 2)* Research in materials and approaches for studio teaching. *Pre: 4 credits in 251 or 6 credits in 261.* Staff

451 Performance as Minor *(I and II, 2)* Upper division. One private 60-minute lesson each week.* Two levels, one per year, as prescribed in syllabi. Recital performances as required by department and instructor. *(Studio 60 min.) May be repeated for credit. Pre: completion of performance minor lower division and permission of department. See under 251 for areas of study.* Staff

455 Senior Recital *(I or II, 0)* Performance of a public program of at least 20 minutes performing time after faculty examination. *Pre: concurrent registration in 451 and four or more prior credits of 451.* Staff

461 Performance as Major *(I and II, 4)* Upper division. One private 60-minute lesson each week.* Two levels, one per year, as prescribed in syllabi. Recital performances as required by department and instructor. *(Studio 60 min.) Pre: completion of performance major lower division and permission of department. See under 251 for areas of study.* Staff

465 Senior Recital for Performance Majors *(I or II, 0)* Performance of a public program of at least 50 minutes performing time after faculty examination. *Pre: concurrent registration in 461 and eight or more prior credits in 461.* Staff

481, 482 Piano Literature and Pedagogy *(I and II, 2 each) 481:* Intensive study of keyboard literature from 1700 to 1825. Analysis of styles and forms and their implications for performance. Teaching methods and materials. *(Lec. 2) Pre: 216, 222, and 251B or 261B or permission of department. 482:* Continuation involving literature from the nineteenth century to the present. *(Lec. 2) Pre: same as for 481. In alternate years, next offered 1989-90.* Fuchs

483, 484 Vocal Literature and Pedagogy *(I and II, 2 each) 483:* Concentrated study of vocal literature of the Baroque and Classic era. Analysis of styles, forms and texts and their influences in performance. Diction, teaching methods and materials. *(Lec. 2) Pre: 216, 222 and 251A or 261A. 484:* Continuation encompassing literature from the nineteenth century to the present. *(Lec. 2) Pre: 483. In alternate years, next offered 1989-90.* Langdon

485 Opera Workshop *(I and II, 1)* Performing techniques for the operatic singer. Coordination of music and drama with emphasis on body movement as it relates to historical periods and national characteristics. Development of professional standards and attitudes. *(Lec. 1, Lab. 2) May be repeated. Pre: 251A Voice or permission of department. In alternate years, next offered 1988-89.* Langdon

496 Jazz Workshop *(SS, 1)* Intensive study of jazz theory and improvisation; rehearsal and performance of jazz literature. *(Workshop 2) Pre: 111 or permission of instructor.* Motycka

512 Advanced Instrumental Conducting *(I, 2)*

537 Musical Thought and Expression *(I, 3)*

540 Advanced Principles of Music Education *(II, 3)*

545 Musical Aptitude and Achievement *(I, 3)*

548 Research in Music *(II, 3)*

551 Performance as Minor or Elective *(I and II, 2)*

555 Graduate Recital for Performance Minor *(I and II, 0)*

561 Performance Major *(I and II, 3, 4, or 6)*

*See p. 21 for the applied music fee associated with this course

565 Graduate Recital for Performance Major *(I and II, 0)*
567 Seminar in Performance and Pedagogy *(II, 2)*
570 Graduate Project *(I and II, 3)*
590 Piano Accompanying *(I and II, 1)*
591 University Symphony Orchestra *(I and II, 1 each)*
593 University Chorus *(I and II, 1)*
594 Symphonic Wind Ensemble *(II, 1)*
595 Concert Choir *(I and II, 1 each)*
596 Jazz and Studio Ensemble *(I and II, 1)*
597 University Chamber Orchestra *(I and II, 1)*
598 Chamber Music Ensemble *(I and II, 1 each)*

Natural Resources Science (NRS)

Chairperson: Professor Wright

100 Natural Resource Conservation *(I, 3)* Introduction to man's use and management of his 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 and II, 3)* Physical, biological, and chemical properties of soils and their practical application to plant science. Introduction to soil genesis, classification, and productivity. Soil-man interactions. *(Lec. 3)* Groffman (N)

213 Introductory Soils Laboratory *(I and II, 1)* Mechanical analysis, mineralogical identification, soil organic matter, bulk density, cation exchange, soil profile, soil water, weathering of minerals, soil acidity, and lime requirements. Independent study. *(Lab. 2) Pre: concurrent registration in 212 or permission of instructor.* Groffman

300 Seminar in Natural Resources *(I, 1)* Review and discussion of research and current topics in natural resources. *(Lec. 1) Pre: 100 and 212. S/U credit.* Felbeck

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: BOT 111.* Brown

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.* Brown

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. 2, Lab. 2) Pre: BOT 111, ZOO 111 and ZOO (BOT) 262.* Staff

306 Wetland Wildlife Management *(II, 3)* Continuation of 305 with introductory wetlands management. Typical furbearers, waterfowl, and fish. Emphasis on habitat management. *(Lec. 2, Lab 2) Pre: 305.* Staff

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)* McKiel

350 Soil Morphological Investigations *(II, 2)* A detailed study of the morphological properties utilized in describing soil profiles. Interpretation of morphological characteristics pertaining to land use. *(Lec. 2) Pre: prior or concurrent registration in 212 or permission of instructor.* Staff

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. *May be repeated with permission of department. (Lab. 5) Pre: 350 or permission of instructor.* Staff

375 Fertilizers and Soil Productivity *(I, 3)* Development, manufacture, and properties of fertilizer materials, lime, compost, sewage, sludge, animal manures, and industrial wastes. Soil fertility evaluation and fertilizer management systems. Economics of fertilizer, lime, and soil amendment use. *(Lec. 3) Pre: 212.* Staff

380 World Soils *(II, 3)* A study of global soils in relation to their distribution, prior, present, and potential future use for agricultural production and development. U.S. and other taxonomic systems are compared. *(Lec. 3) Pre: 212.* 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. *Pre: 100 and 212. Limited to NRS majors. prior approval of department required. May be repeated for a maximum of 6 credits. S/U credit.* Gold

401 Forested Watershed Management *(II, 3)* Effects of forest vegetation on the hydrologic cycle; energy and water budgets. Controlling water yield and quality. *(Lec. 2, Lab. 3) Pre: EST 408 or 220; BOT 323 recommended. In alternate years, next offered spring 1989.* Brown and Gold

402 Wildlife Populations *(II, 3)* Ecological presentation of characteristics of exploitable animal populations and mechanisms that regulate their numbers through time. Methods used in wildlife population research. *(Lec. 2, Lab. 3) Pre: ZOO 111 or BIO 102; ZOO 463 recommended.* Husband

423 Wetland Ecology *(I, 4)* Origin, development, and characteristics of inland and tidal wetlands. Topics include geology, hydrology, soils, plant ecology, succession. Wetlands of North America and the world, with emphasis on the glaciated Northeast. *(Lec. 2, Lab. 4) Pre: BOT (ZOO) 262 and GEL 103 or 105 or permission of instructor.* Golet

424 Wetlands and Land Use *(II, 3)* 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. 3) Pre: 423 or permission of instructor. In alternate years, next offered in 1988-89.* Golet

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.* Wright

451 Soil 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 109 or equivalent.* McKiel

461 Water Resource 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

475 Plant Nutrition and Soil Fertility See Plant Science 475.

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 109 or equivalent or permission of instructor. In alternate years, next offered 1988-89.* McKiel

491, 492 Special Projects *(I and II, 1-3)* Special work to meet the needs of individual students in natural resources. *(Lec. and/or lab. according to nature of project) Pre: permission of department.* Staff

500 Graduate Seminar in Natural Resources *(II-1)*
510 Soil-Water Relations *(II, 3)*
512 Chemistry of Soils and Sediments *(II, 4)*
524 Wetland Mapping and Evaluation *(II, 3)*
567 Soil Genesis and Classification *(I, 4)*

568 Recent Advances in Natural Resources Science *(I, 3)*
591,592 Special Problems *(I and II, 1-3 each)*

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. Staff (L)

300 The New England Experience *(SS, 3)* Life in New England, past and present, through varying disciplines focusing on a new topic each summer. *May be repeated for credit when emphasis changes. (Lec. 3)* Staff

400, 401, 402, 403 Special Topics in New England Studies *(SS, 1-3 each)* Specialized topics in the study of New England offered by specialists in the field. *(Lec. 1) May be repeated with different topics.* Staff

500 Readings in the New England Experience *(SS, 4)*

Nursing (NUR)

Dean: Professor Jean Miller

100 Health, Illness, Nursing, and the Ecosystem *(I or II, 3)* Analysis of ecosystem influences on health, illness, and health care. Political, socioeconomic, environmental, hereditary, and cultural factors related to health and health care delivery with a global view of nursing. *(Lec. 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. Hirsch and Staff (S)

200 Scientific Inquiry in the Practice of Nursing *(I or II, 3)* Introduction to principles of scientific inquiry and research process, including indentification of forms of analytical thinking common to problem-solving in nursing. Opportunity for evaluating and utilizing research findings. *(Lec. 3) Pre: 100, PHL 101 and EST 220.* Staff

210 Introduction to Medical Care I *(I or II, 3)* Examination of etiology, pathogenesis, and clinical manifestations underlying alterations in health across the life span, focusing on medical diagnostics for common health problems. *(Lec. 3) Pre: 100, ZOO 121, 242, MIC 201, PCL 225 and 226. Concurrent enrollment in PCL 226 allowed. (Substitution by other appropriate courses permissable for non-nursing majors.)* Staff

211 Nursing in Contemporary Society *(I, 3)* Trends and issues in professional nursing and nursing education. Adaptation-level theory and related concepts with emphasis on utilization of nursing process. *(Lec. 3) Pre: registered nurse standing or permission of instructor.* Evans

212 Introduction to Medical Care II *(I or II, 3)* Continued examination of etiology, pathogenesis, and clinical manifestations underlying alterations in health across the life span. Focusing on medical therapy for common diseases and disorders. *(Lec. 3) Pre: 210.* Staff

230 General Methods and Strategies in Nursing Practice I *(I or II, 3)* Foundation course in studying general nursing strategies applicable to individual nursing care. Emphasis on theoretical and scientific bases of forms of nursing practice, nursing process, and nursing practice strategies. *(Lec. 3) Pre: 200 and foundation courses in physical and social sciences listed in curriculum.* Staff

235 Practicum in General Nursing Strategies *(I or II, 3)* Development of nursing skills applicable to various individual patient care situations. Focus on assessment, communication, clinical decision-making skills, and techniques of general strategies in the context of nursing process. *(Lab. 9) Pre: 200 and 230. Concurrent enrollment in 230 allowed.* Staff

240 General Methods and Strategies in Nursing Practice II *(I or II, 3)* Continuation of 230 in studying general nursing strategies applicable to individual nursing care. Emphasis on theoretical and scientific bases of nursing strategies for specific patient-care problems. *(Lec. 2, Lab. 3) Pre: 230 and 235. Concurrent enrollment in 235 allowed.* Staff

250 Nursing in Health Promotion *(I or II, 3)* Examination of health promotion in nursing context. Emphasis on macro- and micro-level health promotion strategies applicable to nursing practice. *(Lec. 3) Pre: 200 and 230. Concurrent enrollment in 230 and/or 255.* Staff

255 Practicum in Health Promotion Nursing *(I or II, 3)* Application of health promotion principles and nursing strategies in health promotion to clients of all ages. Emphasis on utilization of the nursing process in selected clinical situations for health promotion. *(Lec. 1, Lab. 6) Pre: 235. Must be taken with or after 250.* Staff

260 Nursing in Short-Term Health Care *(I or II, 3)* Study of health care phenomena frequently associated with short-term illnesses as a conceptual base for analysis and development of nursing care strategies across the life span. *(Lec. 3) Pre: 210, 212, 230, 235 and 240. Concurrent enrollment in 212, 240 and 265 allowed.* Staff

265 Practicum in Short-Term Care of Adults *(I or II, 3)* Application of the nursing process to adults of all ages in short-term health care settings with an emphasis on developing nursing strategies specifically devoted to the restoration of health. *(Lec. 1, Lab. 6) Pre: 250. Concurrent enrollment in 255 or 260 allowed.* Staff

300 Professional Nursing Science and Role Development *(I or II, 3)* Examination of theories, issues, and concepts related to nursing science and professionalism. Emphasis on ethical, moral, and legal conduct, with responsibilities to self, peers, the profession, and society. *(Lec. 3) Pre: senior standing.* Staff

305 Practicum in Nursing of Children *(I or II, 3)* Application of the nursing process to children in short-term and long-term health care settings with an emphasis on developing nursing strategies specifically appropriate for nursing of children. *(Lec. 1, Lab. 6) Pre: 260 and 265.* Staff

310 Family Health Nursing *(I or II, 3)* Analysis of the family as the unit of service, with application of the nursing process in a family centered context. Includes consideration of healthy and troubled families and their nursing care needs. *(Lec. 3) Pre: 260 and SOC 212 (or equivalent). Concurrent enrollment in 315 is allowed.* Staff

315 Practicum in Family Health Nursing *(I or II, 3)* Application of family health nursing concepts with selected families. Experiences with healthy, childbearing, troubled, and high-risk families. *(Lec. 1, Lab. 6) Pre: 265. Must be taken concurrently with or after completion of 310.* Staff

320 Nursing in Long-Term Health Care *(I or II, 3)* Study of nursing care problems associated with chronic illness and nursing managements of clients in various long-term health care settings. Emphasis on theoretical analysis of strategies applicable to long-term care. *(Lec. 3) Pre: 260 and 310. Concurrent enrollment in 325 and 326 allowed.* Staff

325 Practicum in Long-Term Care of Adults *(I or II, 3)* Application of the nursing process with adult clients in various long-term health care phases and settings. Emphasis on developing nursing care strategies including case management for chronically ill clients. *(Lec. 1, Lab. 6) Pre: 315. Must be taken concurrently with or after completion of 320.* Staff

326 Practicum in Mental Health and Psychiatric Nursing *(I or 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 mental health care. *(Lec. 1, Lab. 6) Pre: 310. Concurrent enrollment in 320 allowed.* Staff

330 Community Health Nursing *(I or II, 3)* Analysis of community as a unit of service for nursing. Application of nursing process to groups, population groups, organizations, and

communities. Examination of epidemiological, financial, organizational, and occupational perspectives. *(Lec. 3) Pre: 310 and 315. Concurrent enrollment in 335 is allowed.* Staff

335 Practicum in Community Health Nursing *(I or II, 3)* Application of the nursing process to communities. Experience(s) with a population group, organization, or group in a selected community. In-depth analysis of a selected community, including utilization of epidemiologial process. *(Lec. 1, Lab. 6) Pre: 310 and 315. Must be taken concurrently with or after completion of 330.* Staff

346 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. *Pre: admission to the College of Nursing. S/U credit.* Staff

495 Expanded Nursing Assessment Skills *(I, 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. 3) Not acceptable for graduate program credit in nursing. Pre: permission of instructor.* Castro and Staff

496 Expanded Nursing Assessment Skills: Pediatrics *(I and II, 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. *Pre: 495 or concurrent enrollment in 495 or permission of instructor.* Staff

501 Theoretical Study of Phenomena in Nursing *(I, 3)*
502 Practicum in the Study of Phenomena in Nursing *(I, 3)*
505 Nursing Research *(I or II, 3)*
506 Independent Study in Nursing *(I and II, 2-6)*
510 Advanced Leadership and Nursing Role Development *(I or II, 3)*
511 Advanced Mental Health Nursing I *(II, 3)*
512 Practicum in Advanced Mental Health Nursing I *(II, 3)*
513 Advanced Mental Health Nursing II *(I, 2)*
514 Practicum in Advanced Mental Health Nursing II *(I, 4)*
521 Theoretical Study of Major Problems in Nursing Practice *(II, 3)*
522 Practicum in the Study of Major Problems in Nursing Practice *(II, 3)*
531 Primary Health Care Nursing *(II, 3)*
532 Practicum in Primary Health Care Nursing I *(II, 3)*
533 Primary Health Care Nursing II *(I, 3)*
534 Practicum in Primary Health Care Nursing II *(I, 6)*
541 Theoretical Study of Nursing Education *(I, 3)*
542 Practicum in Nursing Education *(I, 3)*
551 Theoretical Study of Nursing Administration *(I, 3)*
552 Practicum in Nursing Administration *(I, 3)*
560 Ethical Theories, Nursing Practice and Health Care *(I or II, 3)*
561 Theories of Practice for Clinical Nursing *(I, 3)*
562 Advanced Clinical Study of Nursing Practice in Critical Care *(I, 3)*
563 Advanced Clinical Study of Nursing Practice in Gerontology *(I, 3)*
564 Advanced Clinical Study of Nursing Practice in Parent-Child Health *(I, 3)*

Ocean Engineering (OCE)

Chairperson: Professor Silva

346 (or PED 346) Skin and Scuba Diving, Beginners *(I, 2)* Emphasis on basic physical principles, hazards, selection of equipment, and techniques. *(Lec. 1, Lab. 2) Pre: permission of instructor.* McAniff

347 (or PED 347) Skin and Scuba Diving, Advanced *(II, 2)* Emphasis on the skill needed for advanced scuba activities as related to deep dives, salvage. *(Lec. 1, Lab. 2) Pre: 346.* McAniff

351, 352 Plant Design and Economics
See Chemical Engineering 351, 352.

401, 402 Introduction to Ocean Engineering Systems I and II
See Mechanical Engineering 401, 402.

403, 404 Introduction to Ocean Engineering Processes I and II
See Chemical Engineering 403, 404.

406 Introduction to Coastal and Ocean Engineering
See Civil and Environmental Engineering 406.

407 Project in Ocean Engineering
See Civil and Environmental Engineering 407.

410 Basic Ocean Measurements
See Mechanical Engineering 410.

411 Basic Coastal Measurements
See Civil and Environmental Engineering 411.

510 Engineering Ocean Mechanics *(II, 3)*
512, 513 Hydrodynamics of Floating and Submerged Bodies I and II *(I and II, 3)*
521 Materials Technology in Ocean Engineering *(I, 3)*
522 Dynamics of Waves and Structures *(I, 3)*
523 (or CVE 523) Coastal Structures *(II, 3)*
534 (or CHE 534) Corrosion and Corrosion Control *(II, 3)*
535 (or CHE 535) Advanced Course in Corrosion *(II, 3)*
540 (or MCE 540) Environmental Control in Ocean Engineering *(II, 3)*
555, 556 Ocean Energy Systems I and II *(I and II, 3 each)*
560 Introduction to Data Collection Systems *(I, 3)*
561 Introduction to the Analysis of Oceanographic Data *(I, 3)*
565 Ocean Laboratory I *(I or II, 3)*
566 Ocean Laboratory II *(I or II, 3)*
571 (or ELE 571) Underwater Acoustics I *(I, 3)*
587 Submarine Soil Mechanics *(I, 3)*
591, 592 Special Problems *(I and II, 1-6 each)*

Oceanography (OCG)

Dean: Professor Duce

401 General Oceanography *(I and II, 3)* General survey in the major disciplines including geological, physical, chemical, and biological aspects integrated into a conceptual approach to the ocean sciences. *(Lec. 3) Pre: at least one laboratory course in a physical or biological science and junior standing or above.* Napora (N)

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. *Pre: junior year standing in natural sciences, natural resources, or engineering, plus permission of staff. Not for graduate credit. S/U only.* Jeffries and Staff

493, 494 Special Problems and Independent Study in Oceanography *(I and II, 1-6)* Research in oceanography conducted as supervised individual study. *(Lab. 2-12) Pre: junior or senior standing in natural science, natural resources, or engineering plus permission of staff. S/U only.* Staff

501 Physical Oceanography *(I, 3)*
510 Descriptive Physical Oceanography *(II, 3)*
521 Chemical Oceanography *(II, 3)*
524 Chemistry of the Marine Atmosphere *(II, 3)*

540 Geological Oceanography *(II, 3)*
541, 542 Principles of Marine Geology and Geophysics *(I and II, 4 each)*
561 Biological Oceanography *(I, 3)*
565 The Science of Narragansett Bay *(I, 2)*
574 Biology of Marine Mammals *(II, 3)*
576 (or MIC 576) Marine Microbiology *(I, 4)*

Pharmaceutics (PHC)

Chairperson: Professor Rhodes

327 Biopharmaceutics *(I, 2)* Physicochemical properties of dosage forms as they control drug release; dissolution kinetics. *(Lec. 2) Pre: third-year standing.* 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. 2, Lab. 2) Pre: 327 or equivalent.* Rosenbaum

340 Physical Pharmacy *(I and II, 3)* Physicochemical properties of pharmaceutical systems. *(Lec. 3) Pre: third year standing.* Paruta

350 Pharmaceutical Technology *(I and II, 3)* Preparation and evaluation of drug delivery systems. *(Lec. 3) Pre: third year standing.* Kislalioglu

351 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: 344.* Lausier

360 Pharmaceutical Technology Laboratory *(I and II, 1)* Formulation, compounding, and evaluation of drug delivery systems. *(Lab. 4) Pre: third year standing.* Woodford

425 History of Pharmacy *(II, 3)* Historical development of pharmacy in this country and abroad emphasizing the background of recent developments in the profession and related health sciences. *(Lec. 3) Pre: fourth- or fifth-year standing.* Osborne

460 (or PHP 460) Non-Prescription Drugs and Medical Devices *(I and II, 4)* Study and evaluation of non-prescription drugs, health aids, and medical devices. *(Lec. 4) Not for graduate credit. Pre: 330, 331; 4th year standing and permission of department.* Lausier

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. *(Lab. 3-10) Pre: permission of department.* Staff

521, 522 Seminar *(I and II, 1 each)*
535 Pharmacokinetics *(II, 3)*

Pharmacognosy (PCG)

Chairperson: Professor Shimizu
(Pharmacognosy and Environmental Health)

445, 446 General Pharmacognosy *(II and I, 3)* Natural products of biological origin as important pharmaceuticals. Sources, process of isolation and general fundamental properties. *(Lec. 3) Pre: CHM 228, MIC 201 or permission of department.* Shimizu, Chen, and Okuda

447 General Pharmacognosy Laboratory *(I and II, 1)* Introduction to and application of laboratory methods utilized in the preparation, identification, isolation, and purification of pharmaceuticals from natural sources. *(Lab. 3) Pre: CHM 226, BIO 101, 102 or equivalent.* 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, PCG 446, or permission of instructor.* Worthen

497, 498 Special Problems *(I and II, 1-3 each)* Methods of carrying out a specific research project. Literature search, planning, laboratory work, writing acceptable report. *(Lab. TBA) Pre: permission of department for undergraduate students only.* Staff

521, 522 Seminar *(I and II, 1 each)*
532 (or PHP 532) Pharmaceutical Sterile Products *(I, 3)*
533 Medicinal Plants *(I and II, 2)*
536 Antibiotics *(II, 3)*
548 Physical Methods of Identification *(II, 3)*
551, 552 Chemistry of Natural Products *(I and II, 3 each)*
597, 598 Special Problems *(I and II, 1-3 each)*

Pharmacology and Toxicology (PCL)

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)* Swonger and Staff

221 Dental Therapeutics *(I, 2)* Medicinal agents, their actions and therapeutic uses with special emphasis on substances employed in dental practice. *(Lec. 2) For students in dental hygiene.* Rodgers

225 Pharmacology and Therapeutics I *(I, 2)* Properties, actions, uses, adverse effects, and interactions of drugs used in treatment of disease. *(Lec./Recit. 2) Pre: ZOO 242. For students in the College of Nursing.* 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./Recit. 2) Pre: 225. For students in the College of Nursing.* Swonger

344 Principles of Medicinal Chemistry and Pharmacology
See Medicinal Chemistry 344.

436 (or PSY 436) Psychotropic Drugs and Therapy *(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 102, ZOO 111, 121, PSY 381 or permission of instructor.* Swonger

441, 442 General and Clinical Pharmacology *(I and II, 4 each)* Action of drugs on physiological function with reference to responses by tissue systems. Toxic effects, mechanism of action, dosage, and pertinent clinical aspects. *(Lec. 4) Pre: third-year standing.* DeFanti and Staff

443 General Pharmacology Laboratory *(I and II, 1)* Effects of drugs on physiological function with reference to responses by tissue systems. Toxic effects, mechanism of action, and dosage. *(Lab. 3) Pre: fourth-year standing or permission of department.* Chichester, Shaikh

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. *(Lab. TBA) Pre: permission of department.* Staff

521, 522 Seminar *(I and II, 1 each)*
542 Evaluation of Drug Effects *(II, 5)*
544 Forensic Toxicology *(II, 3)*
546 Advanced Toxicology *(II, 3)*
572 Neural Bases of Drug Action *(I, 3)*
580 (or ELE 580) Experimental Animal Techniques *(II, 3)*

Pharmacy Practice (PHP)

Chairperson: Professor Taubman

203 Social and Professional Orientation to Pharmacy *(I and II, 2)* Introduction to social and professional consideration facing the practicing pharmacist, including matters directly related to patient care and interaction with allied health professions. *(Lec. 2) Pre: first and second year standing only.* Staff

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)* Taubman

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. 3)* Campbell and Hachadorian

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. 2, Lab. 3) Pre: fourth-year standing.* Staff

405 Personnel Administration *(I, 3)* Principles of psychology of management and the application of these principles to the resolution of personnel administration problems and in pharmacy organization. *(Lec. 3) Pre: permission of department.* Staff

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 department. In alternate years.* Staff

451, 452 Pharmacotherapeutics I and II *(I and II, 3 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. *Pre: 349, 351; PHC 330, 331, 328; PLC (or MCH) 344; MCH 342; PCG 446; ASP 401; BCP 311. Not for graduate degree program credit.* 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 125 or permission of department.* Taubman and Campbell

460 Non-Prescription Drugs and Medical Devices
See Pharmaceutics 460.

470 Contemporary Pharmacy Practice Lab *(I and II, 1)* Issues associated with the dispensing of medication, use of patient profiles, and effective interaction with patients and health professionals in simulated practice settings. *460 to be taken concurrently. Pre: 451, PCL 441; PCG 445, 447, 459; MCH 442. Not for graduate credit.* Pedro

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.* Taubman

485 Pharmacy Practice Externship *(I and II, 6)* Structured practical experience in selected community and institutional pharmacies. Participation in patient counseling, use of patient profiles, drug distribution, inventory control, and other aspects of contemporary pharmacy practice. *(Lab. 20) Pre: 452, 460, 470; PCL 442, 443; MCH 444. Not for graduate credit.* Larrat

486 Specialty Externship *(I and II, 3-6)* Structured practical experience in institutional community, and non-traditional pharmacy settings. *(Lab. 9-18) May be repeated for up to 12 credits. Pre: permission of department. May not be taken concurrently with 485 or 490. Not for graduate credit.* Larrat and Staff

490 Clinical Pharmacy Clerkship *(I and II, 6)* Faculty-supervised clinical pharmacy experience in affiliated hospitals. Development of general clinical problem-solving and communications skills. *(Lab. 20) Pre: 452, 460, 470; PCL 442, 443, MCH 444. Not for graduate credit.* Mattea 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. *(Lab. 3-10) Pre: permission of department.* Staff

499 Specialty Clerkship *(I and II, 3-6)* Faculty-supervised clinical pharmacy experience in affiliated institutional and ambulatory health care settings. Development of clinical pharmacy skills in various specialty areas. *(Lab. 9-18) May be repeated for up to 12 credits. Pre: permission of department. May not be taken concurrently with 485 or 490. Not for graduate credit.* Mattea and Staff

501 Drug Information Pertaining to Institutional Pharmacy Practice *(I, 3)*
530 Behavioral Skills in Clinical Pharmacy *(SS, 3)*
532 (or PCG 532) Pharmaceutical Sterile Products *(I, 3)*
542 Drug-Induced Diseases *(I, 2)*
570 Case Studies in Pharmacy Law *(II, 3)*

Philosophy (PHL)

Chairperson: Professor Wenisch

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 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 who have passed or are taking 104.* Staff (L)

104 Theories of Human Nature *(I or II, 3)* An introduction to philosophical inquiry by examining critically some major traditional and contemporary views of human nature as expressed in a variety of religious, literary, scientific, and philosophical writings. *(Lec. 3) Not open to students who have taken or are taking 103.* Staff (L)

110 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)

117 Social Philosophy *(I or II, 3)* A systematic introduction to the philosophical problems about 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)

135 Modern Thought: Philosophy and Literature
See Comparative Literature Studies 135.

312 Ethics *(I or II, 3)* Examination of some major ethical theories. Systematic discussion of moral principles guiding human activities. Application of these theories and principles to issues such as abortion, euthanasia, self-defense, sexuality, and suicide. *(Lec. 3)* Schwarz or Wenisch (L)

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)* Schwarz or Staff (L)

318 Recent Philosophers of Socialism *(I or II, 3)* Philosophical issues regarding money, property, and the human condition, mainly from the perspective of a spectrum of socialists and their critics, including Thoreau, Marx, Buber, Dewey, Sartre, and Solzhenitsyn. *(Lec. 3)* Johnson (L)

319 Philosophy of History *(I, 3)* Examination of central philosophical problems raised by the discipline of history: truth and fact in history, historical explanation and understanding, permanence and change in social time. *(Lec. 3)* 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 such thinkers as Augustine, Anselm, Aquinas, and Occam. *(Lec. 3)* Staff (F) (L)

323 Modern Philosophy *(I, 3)* Survey of major thinkers and schools in modern times, including Descartes, Locke, Berkeley, Hume, Leibnitz, Spinoza, Kant, and Hegel. *(Lec. 3)* Staff (F) (L)

324 Recent European Philosophy *(II, 3)* A study of European philosophy from 1840 to

present. Bfitish and Continental developments are discussed and analyzed, including such movements as utilitarianism, idealism, logical atomism, positivism, existentialism, and phenomenology. *(Lec. 3)* 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. Peterson (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. 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, 103 or 104, or permission of instructor.* Staff

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, 103 or 104, or permission of instructor.* 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)* Hanke (L)

352 Philosophy of Science *(I or II, 3)* Analysis of the nature and structure of scientific thought. Consideration of such issues as: structure and types of scientific explanation, verification and falsification, unity of the sciences. *(Lec. 3) Pre: 101, 103 or 104, or permission of instructor.* Kowalski

355 Philosophy of Art *(I or II, 3)* Systematic problems arising from reflection on the creation and perception of works of art. *(Lec. 3)* Hanke (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. *(Lec. 3) May be repeated for credit. Pre: 3 credits in philosophy and permission of instructor.* 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. *(Lec. 3) Pre: 3 credits in philosophy or permission of instructor. In alternate years.* Staff

440 Philosophy of Language *(I or II, 3)* Language in its relation to the world, cognitive and non-cognitive 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: 3 credits in philosophy or permission of instructor.* Young

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: 3 credits in philosophy or permission of instructor.* Kowalski

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. *(Lec. 3) Pre: 101 or 103 or 104 or permission of instructor.* Staff

502, 503 Tutorial in Philosophy *(I and II, 3 each)*
513 General Axiology *(I or II, 3)*
530 Philosophy of Plato *(I or II, 3)*
531 Philosophy of Aristotle *(I or II, 3)*
542 Advanced Studies in Patristic and Scholastic Philosophy *(I or II, 3)*
551 Philosophical Logic *(I or II, 3)*
555 Philosophy of the Arts and Literature *(I or II, 3)*
562 Advanced Studies in Empiricism and Rationalism *(I or II, 3)*
570 Philosophy of Immanuel Kant *(I or II, 3)*
580 Nineteenth-Century Philosophy *(I or II, 3)*
582 Advanced Studies in Contemporary Philosophy *(I or II, 3)*

Physical Education (PED)

Acting Chairperson: Associate Professor Crooker (Physical Education, Health and Recreation)

105 Beginner Elective Activity I: Individual and Dual Sports *(I or II, 1)* Beginning level of instruction for students who have little or no previous experience in the activities offered. Select appropriate letter for activity desired; e.g., 105A Beginning Archery. *(Practicum 3)* Staff

A Archery
B Badminton
C Biking & Hiking
D Bowling
E Canoeing
F Fencing
G Golf
H Gymnastics
I Sailing
K Skiing
L Slimnastics
M Tennis
N Track & Field
P Marksmanship
S Activities for Children
T Handball
W (or MSC) Weight Training & Conditioning
Y Modern Gymnastics
Z Paddleball

106 Activity II: Team Sports and Group Activities *(I or II, 1)* Beginning level of instruction for students who have had little or no previous experience in the activities offered. Select appropriate letter for activity desired. *(Practicum 3)* Staff

A Folk & Square Dance
H Basketball
I Flag Football
J Field Hockey
K Lacrosse
L Soccer
M Softball
N Volleyball
P Campcraft

The above activities may be offered in combination or as a single activity for the entire semester.

115 Team Sports *(I or II, 0.5)* Emphasis on analysis of skills, strategies, class organization, and teaching techniques. (Select appropriate letter for activity desired). *(Practicum 3) Majors only.* Staff

A Basketball
B Field Hockey
C Flag Football
D Recreational Sports
E Lacrosse
F Soccer
G Softball
H Volleyball

120 Weight Training and Physical Conditioning *(I and II, 1)* Principles of weight training and conditioning with emphasis on constructing individual and group exercise programs. *(Lec. 1, Lab. 2) Intended for majors only.* Staff

130 Beginning Swimming *(I and II, 1)* Beginning level of instruction for students who have little or no previous experience. *(Practicum 3)* Staff

131 Beginning Ballet *(I and II, 1)* Introduction to the classical ballet barre. Practical experiences include center work, adagio, allegro, and simple combinations performed on the diagonal. *(Practicum 3)* Marsden

133 Intermediate Ballet *(I and II, 1)* A continuation of basic skills acquired at beginner level designed to increase strength necessary to execute more complicated variations. Extended sequences, more elaborate in their technique. *(Practicum 3)* Marsden

135 Senior Citizens Aquatics *(I and II, 1)* An aquatic program for individuals, age 60 and older. Activities include exercise, swimming instruction, and endurance swimming. *(Practicum 3) S/U credit.* Seleen

140 Beginning Modern Dance *(I and II, 1)* Introduction to basic modern dance technique and movement fundamentals. The study of dance as an art form emphasizing the development of technical skill and performance sensitivity. *(Practicum 3)* Ranslem

153 Beginning Jazz Dance *(I and II, 1)* An introduction to the characteristic and stylistic elements of jazz dance. Emphasis on the development of technical skill and performance awareness. *(Practicum 3)* Staff

160 Beginning Dance Composition *(I and II, 1)* Introduction to dance composition through the use of movement improvisation, pattern construction, and creative studies selected to demonstrate various aspects of the craft of choreography. *(Practicum 3)* Staff

205 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. *(Practicum 3)* Staff

206 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. *(Practicum 3)* Staff

215 Individual Sports *(I or II, 0.5)* Emphasis on analysis of skills, strategies, class organization, and teaching techniques. Select appropriate letter for activity desired. *(Practicum 3) Majors only.* Staff

A Archery
B Badminton
C Bowling
D Fencing
E Golf
F Tennis
G Wrestling

217 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. May be repeated but with different agency. *(Lab. 3) Pre: 314 or permission of department. S/U credit.* Crooker

222 Basic Gymnastics and Tumbling *(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. *(Practicum 3) Intended for majors only.* Henni

223 Advanced Gymnastics *(I and II, 1)* Techniques and acquisition of basic skills. Includes theory and analysis of basic through advanced skills, strategies, and officiating. *Intended for majors only. (Practicum 3)* Henni

230 Intermediate Swimming *(I and II, 1)* Intermediate level of instruction for those students who have acquired the basic skills and have performing experience in swimming. *(Practicum 3)* Staff

233 Classical Ballet: Advanced *(I and II, 1)* Advanced level of instruction for students who have acquired intermediate skills and have performing experience in ballet. *(Practicum 3) Pre: 131, 133.* Marsden

234 Ballet: Pointe and Variations *(I and II, 1)* Beginner pointe for the advanced student in ballet. Emphasis on barre work and variations in the center. *Pre: 233 or permission of instructor.* Marsden

235 Classical Ballet: Pas De Deux *(I and II, 1)* Pas De Deux emphasizes the application of the academic rules of classical ballet combined with consideration and respect for the partner. *Pre: 234 or permission of instructor.* Marsden

242 Intermediate Modern Dance *(I and II, 1)* A progressive development of movement concepts in 140 with emphasis on the qualitative performance of modern dance. *Pre: 140 or equivalent and permission of instructor. (Practicum 3)* Staff

243 Prevention and Care of Athletic Injuries and First Aid *(I, 3)* Conditioning, use of physiotheraphy equipment, massaging, taping and bandaging technique. Latest American Red Cross procedures with the opportunity to receive standard certification. *(Lec. 2, Lab. 2) Intended for physical education majors.* Josephow

251 Folk and Square Dance *(I, 1)* Techniques and acquisition of basic skills. Includes theory and analysis of basic through advanced skills. *Intended for majors only. (Practicum 3)* Robinson

253 Intermediate Jazz Dance *(I and II, 1)* A continuation and development of the technical skills and fundamentals in 153. Emphasis on the exploration of various movement styles and extended movement combinations. *Pre: 153 or equivalent and permission of instructor. (Practicum 3)* Staff

260 Intermediate Dance Composition *(I and II, 1)* Theory and practice of the principles presented in 160. Creative studies will be used to develop compositional skills, focus given to a solo and small group work. *Pre: 160 or equivalent and permission of instructor. (Practicum 3)* Staff

263 Principles of Athletic Coaching *(I and II, 3)* Principles of exercise physiology, leadership, and psychology applied to athletic coaching. Includes materials on administration of athletics. *(Lec. 3)* Sherman, Henni, and Norris

270 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, 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)* Nedwidek and Cohen

275 Physical Fitness Appraisal and Guidance *(I and II, 3)* Principles of exercise, components of cardio-respiratory 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)* Staff

285 Principles of Teaching Physical Education *(II, 2)* Principles of teaching elementary and secondary school physical education as an integral part of total education. Basic concepts for forming general principles to guide the effective planning of physical education programs. *(Lec. 2)* Crooker

295 Physical Education in Elementary Schools *(I and II, 3)* Techniques, including the use of A/V 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) Pre: 285.* Robinson

314 Methods of Teaching Health and Physical Education *(I and II, 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.* Clegg

315 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). Course may be repeated but in a different activity or level. *(Lab. 3) Pre: 314 or permission of department.* Clegg

321 Track and Field *(I and II, 1)* Techniques and acquisition of basic skills. Includes theory and analysis of basic through advanced skills, strategies, and officiating. *Intended for majors only. (Practicum 3)* Sherman

324 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. *(Lec. 1, Lab. 2)* Cohen

330 Life Saving *(I and II, 1) (Practicum 3)* Staff

340 Water Safety Instructor *(I and II, 2) (Lec. 1, Lab. 2)* Staff

341 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)* Staff

342 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)* Staff

343 Advanced Athletic Training: Recognition of Athletic Injuries *(I, 3)* Development of advanced diagnostic techniques for recognizing and evaluating athletic injuries. Devel-

opment of advanced techniques for protection of athletic injuries. *(Lec. 3) Pre: 243.* Josefow

344, 345 Field Experience in Athletic Training I and 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. *(Lec. 1, Lab. 10) Pre: for 344: 243 or permission of department; for 345: 343, 344 or permission of department.* Nedwidek

346 (or OCE 346) Skin and Scuba Diving, Beginners* *(I and II, 2) (Lec. 1, Lab. 2)* McAniff

347 (or OCE 347) Skin and Scuba Diving, Advanced* *(I and II, 2) (Lec. 1, Lab. 2)* McAniff

355 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.* Henni

362 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.* Sherman

364 Coaching of Baseball *(I, 2)* Theory, techniques, and practice in coaching baseball. *(Lec. 2, Lab. 2) Pre: 263 or permission of instructor.* Norris

369 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)* Sonstroem and Clegg

370 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:* ZOO *121.* Bloomquist

380 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)* Crooker and Polidoro

384 Coaching of Football *(I, 2)* Theory, techniques and practice in coaching football. *(Lec. 2, Lab. 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 (or HLT 391 or RCR 391) Directed Study *(I and II, 1-3)* Independent study. Development of an approved project supervised by a member of the department faculty. *Pre: junior standing, permission of department and instructor.* Staff

410 Corrective and Adapted Physical Education *(I and II, 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. 3) Pre: 370 or permission of department.* Bloomquist

430 Adapted Aquatics *(I and II, 3)* Planning, administering, teaching adapted aquatics. Specific theory and methods of teaching swimming to the handicapped. American Red Cross Certificate in adapted aquatics, if current Water Safety Instruction Certificate is held. *(Lec. 2, Lab. 2) Pre: WSI certificate or comparable skill as determined by instructor.* Bloomquist

443 Advanced Athletic Training: Rehabilitation of Athletic Injuries *(II, 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 department. Not for graduate credit.* Josefow

450 Theoretical Aspects of Track and Field Athletics *(II, 3)* Analysis of historical and theoretical foundations associated with track and field athletics. Running, jumping, and throwing events will be analyzed regarding historical evolution, form style, rules, and training. *(Lec. 3) Pre: senior or graduate standing or permission of instructor.* Sherman

466 Modern Dance Choreography *(I and II, 3)* Designed for students and teachers interested in creative dance. Theoretical and practical aspects of the art form are geared to individual abilities. Composition and choreography are major considerations. *(Lec. 2, Lab. 2) Pre: permission of instructor.* Cohen

475 Women in Sports *(I or II, 3)* Historical perspective of women in sports. Exploration of myths and realities relating to the female athlete. Focus on alternatives for the future. *(Lec. 3) Pre: senior or graduate standing or permission of instructor.* Cohen

480 Application of Biomechanics to Coaching Athletics *(I or II, 3)* Relationship of sound mechanical principles to effective techniques of coaching men, women, and children. Analysis of the fundamental mechanical principles essential to human motion in athletics. *(Lec. 3) Pre: 263; senior or graduate standing or permission of instructor.* Sherman

484 (or HLT 484 or RCR 484) Supervised Field Work *(I and II, 6 or 12)* Supervised field work in health, physical education, or recreation in community and/or commercial agencies. *Not for teacher certification or graduate credit. Pre: permission of department.* Crooker

486 (or HLT 486 or RCR 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. *Not for graduate credit. Pre: concurrent registration in 484.* Crooker

495 Directed Study *(I and II, 3)* Honors thesis or equivalent project. Student determines problem and develops plan of study with faculty guidance. Project may be completed in one to two semesters, maximum three credits. *Pre: admission to the department honors program.* Polidoro

Note: student teaching includes practicum in both elementary and secondary schools under the supervision of the department staff. See EDC 485, 486, 487, 488 and 489.

510 Current Issues in Physical Education, Health, and Recreation *(I or II, 3)*
520 Curriculum Construction in Physical Education *(I or II, 3)*
530 Research Methods and Design in Health and Physical Education *(I or II, 3)*
531 Advanced Experimental Techniques in Physical Education *(II, 3)*
540 Principles of Recreation Leadership *(I or II, 3)*
543 Outdoor Recreation and Education *(I or II, 3)*
550 Administration of Physical Education *(I or II, 3)*
551 Sport and Recreation Operations *(I or II, 3)*
552 Supervision of Physical Education and Health Instruction *(I or II, 3)*
560 (or HLT 560) Seminar in Health, Physical Education, and Recreation *(I or II, 3)*
561 Science in Sport and Exercise *(I or II, 3)*
562 Advanced Exercise Physiology *(I or II, 3)*
563 Fitness Programs for the Middle-Aged and Elderly *(I or II, 3)*
564 Physiology of Aging *(I or II, 3)*
570 (or HLT 570) Major Health Problems and Curriculum Planning in Health Education *(I or II, 3)*
575 Perceptual-Motor Education *(I or II, 3)*
578 Sport in American Culture *(I or II, 3)*
580 Physical Education for the Mentally Retarded and Learning Disabled *(I, 3)*
581 Psychological Effects of Healthy Lifestyle *(I or II, 3)*
582 Sport Psychology *(I or II, 3)*

*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 reference to an approved physician prior to July 1 for enrollment in the fall semester, and November 1 for enrollment in the spring semester.

585 Adapted Physical Activities for Special Populations *(I, 3)*
591 (or HLT 591) Special Problems *(I or II, 3)*
595 (or HLT 595) Independent Study *(I or II, 3)*

Physical Therapy (PHT)

Director: Associate Professor Rowinski

410 Human Anatomy, Embryology, and Histology *(I, 5)* Integrated study of the gross structured, developmental, and microscopic human anatomy. Emphasis on functional relationships of the gross musculoskeletal, neural, and cardiovascular systems in preparation for physical examination and therapeutic practice. *(Lec. 3, Lab. 6) Pre: ZOO 121, 242; admission to physical therapy program or permission of instructor.* Staff

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 Psycho-Social Needs of the Disabled *(I, 2)* The physical therapist's role in addressing the psycho-social 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.* Staff

418 Professional and Community Practices in Physical Therapy *(I, 2)* Introduction to relations 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. *(Lec. 2) Pre: Admission to the physical therapy program or permission of instructor.* Staff

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: ZOO 242; admission to physical therapy program or permission of instructor.* Staff

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: ZOO 242; admission to physical therapy program or permission of instructor.* Staff

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: ZOO 121, 242; admission to physical therapy program or permission of instructor.* Staff

510 Biomechanics and Pathokinesiology *(II, 3)*

532 Physical Agents and Instrumentation in Physical Therapy *(II,4)*

Physics (PHY)

Chairperson: Professor Malik

102 Fundamental Physics *(I, 2)* Fundamental principles of physics primarily for students of nursing. Non-mathematical qualitative course. *(Lec. 2) Will not serve as a basis for advanced study in physics. Required by College of Nursing. Concurrent registration in 103 required.* Staff

103 Laboratory for Fundamental Physics *(I, 1)* Laboratory exercises related to topics in 102. *(Lab. 2) Concurrent registration in 102 required.* Staff

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) Not open to students who have passed either 111, 112, 213, or 214. Concurrent registration in 110 required.* Staff

110 Laboratory for Introduction to Physics *(I and II, 1)* Demonstrations and laboratory exercises related to 109. *(Lab. 2) Concurrent registration in 109 required.* Staff

111, 112 General Physics *(I and II, 3 each) 111:* Mechanics, heat and sound. *112:* Optics, electricity, magnetism, and modern physics. Non-calculus presentation of fundamental physics. Suitable for premedical and predental students. *(Lec. 3) Concurrent registration in 185, 186 required.* Malik (N)

120 Physics and the Energy Crisis *(II, 3)* Qualitative treatment of the physical principles and laws relating to energy. Limitations on energy conversion processes; application to current and projected energy sources. *(Lec. 3) Intended for non-science majors; not open to those who have passed 111, 112, 213, or 214.* Pickart (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)* Hartt (N)

140 The Ideas of Physics *(I and II, 3)* A nonmathematical 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 and II, 1 each)* Selected laboratory exercises applicable to materials in 111, 112. *(Lab. 2) Concurrent registration in 111, 112 required.* Staff (N)

213, 214 Elementary Physics *(I and II, 3 each) 213:* Mechanics and elements of thermodynamics. *214:* Electricity, magnetism, and elements of wave phenomena. *(Lec. 3) For students planning to major in one of the sciences. Pre for 213: MTH 141 and 142 (latter may be taken concurrently). Pre for 214: MTH 142 and 243 (latter may be taken concurrently). Concurrent registration in 285, 286 is required.* Staff (N)

223 Introduction to Acoustics and Optics *(I and II, 3)* Intended primarily for students in the College of Engineering. Fundamentals of acoustical and optical and related phenomena. *(Lec. 3) Pre: MCE 162 and 263 to be taken concurrently.* Hartt

285, 286 Physics Laboratory *(I and II, 1 each)* Selected groups of laboratory exercises applying to 213 and 214. *(Lab. 2, Rec. 1) Concurrent registration in 213, 214 is required.* Staff (N)

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: 213, 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: 214, MTH 243.* Staff

334 (or AST 334) Optics *(II, 3)* Geometrical and physical optics; thick lens optics, interference, diffraction, polarization. *(Lec. 3) Pre: 214.* 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, MTH 142. As an alternative to 214: 223 and ELE 210.* 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: 214.* Desjardins and Nunes

401, 402 Seminar in Physics *(I and II, 1 each)* Preparation and presentation of papers on selected topics in physics. *(Lec. 1) Required of all graduate students in physics; one semester required for all senior physics majors.* Staff

406 (or AST 406 or MCE 406) Atmospheric Physics I *(I, 3)* Thermodynamics of physical processes in the atmosphere, including radiation and energy transfer; hydrostatics and the vertical structure of the atmosphere; global climate modeling and other physical applications. *Pre: 214 or equivalent and MTH 244.* Hartt, Penhallow

407 (or AST 407 or MCE 407) Atmospheric Physics II *(II, 3)* Continuation of 406. Dynamics and kinematics of atmospheric motion; vorticity, circulation, wave motion; numerical weather prediction; modeling the general circulation and climatic change; other physical applications. *Pre: 406.* Hartt, Penhallow

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. *(Led. 3) Pre: 341 and CSC 202.* 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: 213 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 department.* Staff

451 Introduction to Quantum Mechanics *(I, 3)* Photoelectric, Compton effects; spectra, atomic structure, matter waves, duality, uncertainty, Schrodinger equation; 1D, hydrogen. Postulates: wave functions, dynamical variables, Hermiticity, eigenvalues, commutators, generalized uncertainty. Angular momentum: spherical harmonics, Pauli matrices. Spin-orbit, Zeeman effects; angular momenta addition. *Pre: 322 and 341, 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, MTH 461.* Staff

455 Introduction to Solid State Physics *(I, 3)* Structural properties of crystal lattices; thermal, electrical, and magnetic properties of solids; free electron theory of metals, band theory of solids, semi-conductors, imperfections in crystals. *(Lec. 3) Pre: 322, 331, 341, 451, MTH 243.* Staff

483, 484 (or AST 484) Laboratory and Research Problems in Physics *(I and II, 3 each)* Research in current areas of physics. First semester: experiments drawn from various fields such as spectroscopy, optics, nuclear physics, acoustics, etc., and familiarization with research programs in the department. Second semester: research project, with individual faculty member, related to an active research project. *(Lec. 1, Lab. 6) Pre: 381, 382.* Staff

491, 492 (or AST 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. *(Lec. or Lab. according to nature of problem) Pre: Permission of the department.* Staff

510, 511 Mathematical Methods of Physics *(I and II, 3 each)*
520 Classical Dynamical Theory I *(I, 3)*
525 Statistical Physics *(I, 3)*
530 Electromagnetic Theory I *(II, 3)*
531 Electromagnetic Theory II *(I, 3)*
550 Physical Acoustics *(I, 3)*
560 Experimental Techniques in Condensed Matter Science *(I or II, 3)*
570 Quantum Mechanics I *(II, 3)*
571 Quantum Mechanics II *(I, 3)*
585 Acoustic Measurements *(II, 2)*
590, 591 Special Problems *(I and II, 1-6 each)*

Plant Sciences (PLS)

Chairperson: Professor Hull

101 Home Grounds *(I and II, 3)* Principles and practices in the culture and maintenance of flowers, lawns, shrubs, trees, fruits, and vegetables, including plant propagation and labor-saving suggestions for the home property. *(Lec. 3)* Staff

200 Introduction to Plant Protection *(I, 3)* 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. 3) Pre: BIO 101 or BOT 111.* Englander

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 architecture and landscape development from ancient to modern times. Emphasis on European Renaissance through contemporary United States *(Lec. 3)* Hanson (L)

204 Agricultural Plant Science *(II, 4)* An introduction to the agricultural use, production, and distribution of economic plants. *(Lec. 3, Lab. 2) Pre: BOT 111 or permission of instructor.* Staff

210 Introductory Plant Protection *(I, 1)* Introduction to practical aspects of plant protection. Optional recitation for 200. In-depth development of selected topics in 200, primarily through discussion session and field examination of specimens. *(Rec. 2) Pre: concurrent registration in 200.* Englander

233 Floral Art *(I and II, 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, Studio 4)* Mallon (A)

243 Landscape Architecture Graphics See Landscape Architecture 243.

244 Basic Landscape Architectural Design See Landscape Architecture 244.

306 Arboriculture *(I, 3)* Culture of ornamental trees, shrubs, and vines, including understanding of phases of primary and secondary growth and application to practices of protection, transplanting, pruning, staking, and fertilization. *(Lec. 2, Lab. 2) Pre: 204.* McGuire

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: 204. In alternate years, next offered fall 1989.* Staff

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: 204 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: 204 or permission of instructor. In alternate years, next offered fall 1988.* 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: 201 or permission of instructor. Not open to Landscape Architecture majors.* Simeoni

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: 204. In alternate years, next offered spring 1990.* Staff

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: 204.* Shaw

332 Plant Pathology: Introduction to Plant Diseases
See Botany 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, Studio 4) Pre: 233 or permission of instructor.* Mallon

341 Lawn Management *(I, 3)* Fundamental aspects of turfgrass science including identification, propagation, fertilization, pest control, and other soil-plant relationships. *(Lec. 2, Lab. 2) Pre: 204, NRS 212.* Duff

343 Techniques in Landscape Design
See Landscape Architecture 343.

344 Techniques in Landscape Design II
See Landscape Architecture 344.

350 Interior Plantscaping *(II, 3)* Identification, growth characteristics, culture, use, maintenance, and management of plants suitable for interior landscape situations. *(Lec. 2, Lab. 2) Pre: 204 or permission of instructor.* Shaw

353 Fundamentals of Ornamental Plant Classification
See Landscape Architecture 353.

382 World Food Crops *(II, 3)* Classification, origin, nutritional value, and uses of world food crop plants. Influence of climate, soils, and management on the production of crops used by man. Ecological distribution of important world crops. *(Lec. 3) Pre: 204 or BOT 111 or BIO 101. In alternate years, next offered fall 1988.* Sullivan

384 Field Crop Production *(I,3)* A study of the culture of field crops of regional and national importance. Emphasis on the practical and applied developments in science and technology. *(Lec. 2, Lab. 2) Pre: 204 and NRS 212.* Sullivan

385 (or ZOO 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 evolution and management strategies. *(Lec. 3) Pre: BOT 111 or BIO 101 and ZOO 111 or BIO 102, or equivalent. Concurrent registration in 386 required for B.S. zoology major credit.* LeBrun

386 (or ZOO 382) Introductory Entomology Lab *(I, 1)* Insect structure, function and systematics with field studies in the ecology, survey, and collection of insects in their natural environment. *(Lab. 3) Pre: 385 or concurrent registration in 385.* LeBrun

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 109. In alternate years, next offered in spring 1989.* 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: 381 or 401, 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. *May be taken for a maximum of six credits. S/U credit. Pre: 204 or permission of instructor.* Staff

401, 402 Plant Sciences Seminar *(I and II, 1)* Presentations and discussions of current topics of concern to producers and consumers of plants and plant products, including plant protection. *(Lec. 1) Pre: permission of instructor.* Staff

403 Applied Insect Ecology *(II, 3)* Principles of ecology combined with practical aspects of pest recognition and control. Lecture: development of pest management systems. Lab: emphasis on insects of importance to ornamentals, gardens, and households. *(Lec. 1, Rec. 1, Lab. 2) Pre: 385 or ZOO 381 or permission of instructor. In alternate years, next offered spring 1990.* Casagrande

405 Propagation of Plant Materials *(II, 3)* Theoretical and practical study of propagation including grafting, budding, cuttage, and seedage. *(Lec. 2, Lab. 2) Pre: 204, BOT 245.* McGuire

413 Plant Cell and Tissue Culture *(I, 3)* Growth and differentiation of isolated cells, plant propagation, somatic hybrid and haploid plant production, cell selection to applied stress, production of natural products, and genetic engineering of plant cells. *(Lec. 3) Pre: BOT 245. In alternate years, next offered, fall 1989.* Krul

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, 316. Not for graduate credit.* Shaw

420 Crop Ecology *(II, 3)* Environmental factors affecting growth of crop plants. Influence of management, climate, and soil factors on energy relationships, interplant competition, crop adaptation, persistence, and productivity. Student project required. *(Lec. 3) Pre: 204, BIO 101 or BOT 111. In alternate years. Next offered spring 1990.* Sullivan

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 1990.* 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: BOT 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) Must be taken concurrently with 440.* Jackson

442 Professional Turfgrass 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.* Duff

443 Planting Design
See Landscape Architecture 443.

444 Environmental Aspects of Landscape Design
See Landscape Architecture 444.

445 Advanced Landscape Design
See Landscape Architecture 445.

446 Landscape Construction
See Landscape Architecture 446.

447 Professional Landscape Architectural Practice
See Landscape Architecture 447.

454 Identification of Basic Ornamental Plants
See Landscape Architecture 454.

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, BOT 245, organic chemistry desirable. In alternate years. Next offered fall 1989. Sullivan and Hull

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, 1989.* Jackson and Wallace

465 Etiology of Plant Disease *(I, 3)* Identification and classification of the agents causing plant disease, and a study of the activities of these causal agents that lead to disease development. *(Lec. 3) Pre: BOT or PLS 332. In alternate years, next offered fall 1989.* Mueller and Englander

472 Plant Improvement *(II, 3)* Breeding of economic crops with major emphasis on vegetables, ornamentals, flowers, turfgrasses. Objectives and techniques of selection, pure line, hybridization breeding; quantitative variability; seed production; application of genetic principles to breeding problems. *(Lec. 2, Lab. 2) Pre: ASP 352 or BOT 352. In alternate years, next offered 1989.* Staff

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 interaction, radioisotopes, and deficiency symptoms. *(Lec. 3, Lab. 2) Pre: NRS 212, BOT 111, 245 and organic chemistry. In alternate years, next offered spring 1990.* Hull

482 Origin and Adaptation of Shade and Ornamental Trees *(II, 3)* Study of origin, beginning of cultivation, and variation under domestication of the common species of trees that are closely associated in settled habitations. *(Lec. 3) Pre: BOT 111 or BIO 101. Nor for graduate credit.* Staff

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. *(Lec. and/or Lab. according to nature of project). Pre: permission of department.* Staff

501 to 504 Graduate Seminar in Plant Sciences *(I and II, 1 each)*
511 The Nature of Plant Disease *(I, 3)*
512 Plant Growth and Development *(II, 4)*
513 Laboratory Plant Tissue Culture *(II, 1)*
571 Plants, Insects and Pathogens *(II, 3)*
572 (or BCP 572) Plant Biochemistry *(I, 3)*
576 Physiology of Plant Productivity *(I, 3)*
591, 592 Non-Thesis Research in Plant Sciences *(I and II, 1-3 each)*

Note: For other related courses see BOT 332, 432, 536, 540, and ZOO 381, 482, 581, 586.

Political Science (PSC)

Chairperson: Professor Hennessey

113 American Politics *(I and 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. 3)* Warren and Staff (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. 3)* Warren and Staff (S)

201 Introduction to Comparative Politics *(I, 3)* Trends in comparison of government systems, and of indices for political development. Illustrations and comparisons from the American, European, and developing nations. *(Lec. 3)* Milburn (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 level. *(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)

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. *Pre: Three credits in the social sciences recommended or permission of instructor.* Tyler and Killilea

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: permission of instructor.* Murphy

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 millenarianism to Latin American and Asian communism. *(Lec. 3) Pre: 113.* Rothstein

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.* Leduc, Tyler

369 Legislative Process and Public Policy *(II, 3)* Analysis of American legislative bodies, particulary 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

375, 376 Field Experience in Practical Politics *(I, 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. *S/U credit. 1-3 credits per semester; maximum of 6 credits. Pre: 12 credits in the social sciences including six credits in political science; permission of instructor.* Staff

377 Politics of the People's Republic 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 and 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, U.S.S.R., one other country. *(Lec. 3)* Milburn (F)

407 The Soviet Union: Politics and Society *(II, 3)* Politics and society of the Soviet system including the role of the Communist party, economic planning, ethnic minorities, the intelligentsia, the "new Soviet man." *(Lec. 3) Pre: 116 or Russian history course recommended. In alternate years, next offered 1989-90.* Staff (F)

408 African Governments and Politics *(1, 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.* Milburn (F)

410 Issues in African Development
See African and Afro-American Studies 410.

420 Non-Violence and Change in the Nuclear Age *(I, 3)* Focuses on the philosophies and political participation of individuals and movements working non-violently for social change, conflict resolution, and to end the threat of nuclear war. *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, EST 408 or their equivalent 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.* Warren

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.* Warren

434 American Foreign Policy *(II, 3)* Analysis of the institutions, techniques and instruments of policymaking and the execution of foreign policy. *(Lec. 3) Pre: 116.* Staff

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 department.* Killilea

444 Marxist Political Thought *(II, 3)* A systematic analysis of the political thought of Marx, Engels, Lenin, later Marxists and revisionists emphasizing the state, revolution, political economy, and social structure. *(Lec. 3) Pre: 342, 343,443, PHL 117, 318 or permission of instructor. In alternate years.* Rothstein

455, 456 Directed Study or Research *(I and II, 3 each)* Special work arranged to meet the needs of individual students who desire advanced work in political science. *(Lec. 3) Pre: permission of department.* Staff

460 Urban Politics *(I and II, 3)* Contemporary urban politics and policy formation. Political behavior, decision-making, and administration examined in relationship to the crisis of the cities, the changing metropolis, and the growth of the megalopolis. *(Lec. 3) Pre: 113.* Wood and Zucker

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.* Wood

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.* Wood and Zucker

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.* Wood

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.* Wood

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.* Rothstein

481, 482 Political Science Seminar *(I and II, 3 each)* Intensive studies in various important fields in political science. Class discussion of assigned readings and student reports. Emphasis on independent research. *(Lec. 3) Pre: 6 credits in political science beyond 113, 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: permission of instructor.* Staff

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 department.* 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

495 Comparative Urban Politics *(I, 3)* Analysis of urban processes and policy formation affecting urbanization in the United States, Europe and selected developing nations. *(Lec. 3) Pre: 113 or 116 or permission of department.* Milburn

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 department.* Staff

501 Administrative Theory *(I and II, 3)*
502 Techniques of Public Management *(I and II, 3)*
503 Problems in Public Personnel Administration *(I or II, 3)*
505 (or SOC 505) Public Program Evaluation *(I and II, 3)*
506 Seminar in Budgetary Politics *(I, 3)*
510 Developing Nation-State: Africa *(II, 3)*
512 Seminar in Marine Science Policy and Public Law *(II, 3)*
521 (or LRS 521) International and Comparative Trade Unions and Labor Relations *(I or II, 3)*
522 Comparative American Local Politics *(I, 3)*
523 Seminar in Comparative Public Administration *(I, 3)*
524 Seminar in Public Policy Problems *(I and II, 3)*
544 Democracy and Its Critics *(I, 3)*
546 Alternative Prospects for Humanity *(II, 3)*
555, 556 Directed Study or Research *(I and II, 3 each)*
568 Jurisprudence *(II, 3)*
573 Administrative Law *(I, 3)*
577 (or MAF 577) International Ocean Law *(1, 3)*
590 Internship in Public Administration *(I and II, 3-6)*
595 Problems of Modernization in Developing Nations *(II, 3)*

Portuguese (POR)

Section Head: Associate 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.* Staff (F)

102 Beginning Portuguese II *(I and II, 3)* Continuation of 101. *(Lec. 3) Pre: 101, 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, 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, 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, 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, equivalent or permission of instructor. May be taken concurrently with 205 or 206 by permission of instructor. May be repeated for credit as often as the 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. *(Lec. 3) Pre: one 300-level course in Portuguese; acceptance of a project by a member of the staff and departmental approval. Not for graduate degree program credit.* Staff

Psychology (PSY)

Chairperson: Professor N. Smith

103 Towards Self-Understanding *(I and II, 3)* Individual and social problems of normal persons. Personality development, social behavior, and adjustive 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. 2, Rec. 1) 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 mainly upon 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 Alchohol Troubled Person: Introductory Concepts *(I and II, 3)* Introductory and basic concepts in alchohol trouble: prevention, identification, early intervention, treatment, education. *(Lec. 3)* Staff

300 Quantitative Methods in Psychology I *(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 course in mathematics at the college level, 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) pre-clinical, (b) community, (c) laboratory, and (d) organizational applications. *(Lec. 1, Lab. 4) May be repeated once. Pre: 113 and permission of instructor.* 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. 2, Lab 2) Pre: 254, junior standing, and permission of department.* 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.* A. Lott and B. Lott

361 Learning *(II, 3)* Learning process in humans and subhumans, including principles, and methods. Course features operant learning and behavior modificiation principles. *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, 361 (usually taken concurrently) 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. *(Lec. 3) Pre: permission of instructor and 381 (may be taken concurrently).* 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. *Pre: 113, 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, 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

397 Honors Seminar *(I, 3)* Optional seminar for honors candidates focusing on helping the student to develop an honors project. Discussion of various research possibilities with emphasis on alternative modes of inquiry. *(Lec. 3) Pre: senior majors, permission of department, 3.3 overall G.P.A., 3.25 psychology G.P.A. Registration for two semesters of Honors Colloquium.* Staff

398 Honors Project *(II, 3)* Independent project culminating in an honors thesis. Faculty guidance in delineating a problem within the major area surveyed in the honors seminar the preceding semester. *(Lec. or Lab. 3-6) Pre: permission of instructor. 3.3 overall G.P.A., 3.25 psychology G.P.A. Registration for two semesters of Honors Colloquium.* Staff

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 intellective 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 Pharmacology and Toxicology 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: permission of department.* Gross

450 Cognitive and Behavioral Analysis of Communication *(II, 3)* Treatment of psychological processes and problems related to human communication. Emphasis is on various types of psychological analysis used in understanding communicational processes from the individual standpoint. *(Lec. 3) Pre: 113 and permission of instructor. In alternate years, next offered 1989-90.* Silverstein

454 Group Processes *(I, 3)* A conceptual and empirical analysis of small group behavior. The study of group dynamics will include such topic areas as: exchange theory, social facilitation, group problem-solving and decision-making, power, leadership, and communication networks. *(Lec. 3) Pre: 113, 300, 435 and/or permission of instructor.* Cohen

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: 113 and 300; 435 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 CCE:* Willoughby and Staff

464 Humanistic Psychology *(II, 3)* Discussion of humanistic approaches to the understanding and direction of behavior. Emphasis on the 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 1989-90.* 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, Willoughby, and Staff

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. *(Lec. 3) Pre: 113, 435.* Cohen, A. Lott, B. Lott, and Stevenson

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) personality, (b) learning, (c) methods and design, (d) developmental, (e) motivation, (f) perception, (g) clinical, (h) general, and (i) humanistic psychology. *(Lec. 3) A maximum of 4 semesters may be taken. Pre: 301, permission of department.* 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 PSY course.* B. Lott and 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. *May be repeated once. Pre: senior or graduate standing or permission of instructor.* Staff

499 Psychology Practicum *(I and II, 1-6)* Individual and group projects applying psychology in clinical or laboratory settings. *May not be counted toward the 30 credit major in psychology. May be repeated up to 6 credits. (Lab. 3-18) Senior standing or permission of instructor. S/U only.* Staff

505 Community Psychology *(I, 3)*
510 Intermediate Quantitative Methods *(II, 3)*
517 (or EST 517) Small N Designs *(II, 3)*
520 Mental Measurement and Test Theory *(I or II, 3)*
522 Behavioral Assessment Techniques *(II, 3)*
532 Experimental Design *(I or II, 3)*
534 Structured Personality Assessment *(II, 3)*
540 (or EDC 540) Learning Disabilities: Assessment and Intervention *(SS, 3)*
544 The Psychological Bases for Reading Disorders *(I or II, 3)*
550 Operant Analysis of Behavior *(I or II, 3)*
554 Alternate Therapies *(I or II, 3)*

Recreation (RCR)

Acting chairperson: Associate Professor Crooker (Physical Education, Health and Recreation)

280 Introduction to Recreation and Leisure Studies *(I, 3)* Development of recreation from an historical and cross-culture 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

306 Outdoor Recreational Activities *(I, 3)* Lecture topics: back-packing, bicycling, camping, canoeing, horseback riding, mountain climbing, sailing, scuba diving, orienteering, emphasizing skills, equipment, instruction centers, appreciation of natural areas. *(Lec. 3)* Seleen

383 Introduction to Outdoor Recreation *(I, 3)* Outdoor recreation as a distinct and separate concept, land and water resources, the various activities, and the necessary facilities. Considerable attention to the concern and role of governmental agencies and private enterprise. *(Lec. 3)* Crooker

391 Directed Study
See Physical Education 391.

416 Aging and Leisure *(I or II, 3)* The aging process and its impact on leisure pursuits and recreation programming for older adults. Researching needs assessments; program adaptation; fitness benefits; and retirement planning. In alternate years. *Pre: junior or senior standing.* Seleen

484 Supervised Field Work
See Physical Education 484.

485 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 care and maintenance. Course includes field trips. *(Lec. 3) Pre: junior standing and permission of department.* O'Leary

486 Field Experience Seminar
See Physical Education 486.

Religious Studies (RLS)

Chairperson: Professor Wenisch (Department of Philosophy)

111 Comparative Religion *(I and II, 3)* Teachings of major world religions. Emphasis on Judaism, Christianity, and Islam. Some comparison with Eastern religions, specifically Hinduism and Buddhism. 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)* Staff (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)* Staff (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)

227 Augustine's Confessions *(I or II, 3)* The life and thought of Augustine as recorded in the *Confessions* with particular reference to his interpretation of religious experience. *(Lec. 3)* Young (L)

327 Classical Religious Thinkers *(I or II, 3)* Intensive study of the thought of one or more religious thinkers in the tradition ranging from Philo of Alexandria to Kierkegaard. *(Lec. 3)* Young

Resource Development Education (RDE)

Chairperson: Assistant Professor Patnoad

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 years.* Mallilo

444 Teaching of Agribusiness and Natural Resources
See Education 444.

486 Internship *(I and II, 1-6)* Supervised participation in programs related to cooperative extension and teaching of agribusiness and natural resources. *Minimum of 35 hours' work per credit hour. May be repeated for a maximum of six credits.* Abedon

Resource Economics (REN)

Chairperson: Associate Professor Weaver

105 Introduction to Resource Economics *(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)* Weaver (S)

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 126 or 125 or permission of instructor.* Anderson

330 Managing Small Farms *(II, 3)* Production, marketing, and policy problems for small farming operations. Decision-making, capital, and information sources. *(Lec. 3) Pre: 105 or permission of instructor.* Wallace

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. *Pre: 105 or permission of instructor.* Holmsen

341 Economics of Agricultural and Seafood Marketing *(I, 3)* The function, structure, and operation of agricultural and seafood markets; prices, costs, and margins; international trade; channels of distribution; futures markets; market information; regulations and controls; cooperative marketing. *Pre: 105, or ECN 126, or permission of instructor.* Anderson

410 Economics of Natural Resource Use *(II, 3)* Physical, institutional and economic factors affecting the use of natural resources. Economics of conservation and scarcity applied to energy, commercial fishing and pollution problems. Economic dimensions of public policy alternatives. *(Lec. 3) Pre: ECN 328 or equivalent.* Sutinen

432 Economics of Land and Water Resources *(II, 3)* Examines the relationship between public policies and the allocation of land and water resources. Topics include open space preservation, coastal development, recreation, forest and water management, and water pollution control. *(Lec. 3) Pre: 105, or ECN 126, or permission of instructor.* G. Wichelns

435 Aquacultural Economics *(I, 4)* Application of production economics and farm management principles to aquacultural production. Selected methods of measurement and analysis illustrated by case studies involving private or public aquacultural production and marketing. *(Lec. 3, Lab. 2) Pre: 105 or permission of instructor. In alternate years, next offered fall 1988.* Gates

440 Benefit-Cost Analysis *(I, 3)* Basic concepts in benefit-cost analysis. Measurement, comparison of benefits and costs over time, and criteria for project design and selection. Problems and case studies in evaluation of natural resources. *(Lec. 3) Pre: 105 or permission of instructor.* Grigalunas

460 Economics of Ocean Management *(II, 3)* The role of marine resources use in the economy. Oceans policy arising from multiple use conflicts. Current marine resource issues such as fisheries, offshore oil, marine mining, shipping examined. *(Lec. 3) Pre: 410 or permission of instructor.* Sutinen

491, 492 Special Projects *(I and II, 1-3 each)* Workshop for advanced students wherein individuals or small groups are assigned projects requiring the analysis of natural resource and allocation problems with particular emphasis on marine resources. *Pre: permission of department.* Staff

514 Economics of Marine Resources *(I, 3)*
520 Production Economics *(II, 2)*
522 Mathematical Programming for Natural Resource Management *(I, 2)*
524 Dynamic Economic Models *(I, 3)*
527 (or ECN 527) Macroeconomic Theory *(I, 3)*
528 (or ECN 528) Microeconomic Theory *(I, 3)*
532 (or CPL 521) Land Resource Economics *(II, 3)*
534 Economics of Natural Resources *(II, 3)*
540 Applied Resource Economics *(II, 3)*
543 Economic Structure of the Fishing Industry *(I, 3)*
576 (or ECN 576, EST 576) Econometrics *(I, 3)*
591, 592 Special Projects *(I and II, 1-3 each)*
595 Problems of Modernization in Developing Nations *(II, 3)*

Respiratory Therapy (RTH)

499 Special Problems *(I and II, 1-3)* Method of carrying out a specific research project. Literature search, planning, laboratory work, writing an acceptable report. *(Lab. 3-9) Pre: permission of department. Not for graduate credit.* Staff

Russian (RUS)

Section Head: Associate 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.* Staff (F)

102 Beginning Russian II *(I and II, 3)* Continuation of 101. *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.* Aronian (F)

104 Intermediate Russian II *(I and II, 3)* Continuation of 103. *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: prior or concurrent registration in 205, 206. In alternate years, next offered 1989-90.* 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)* C. Driver and 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: prior or concurrent registration in 205, 206. In alternate years, next offered 1989-90.* Aronian

497, 498 Directed Study *(I and II, 3 each)* For the advanced student. Individual research and reports on problems of special interest. *Pre: acceptance of a project by a member of the staff and departmental approval.* Staff

Social Welfare (SWF)

Chairperson: Professor Loy (Sociology and Anthropology)

311 Introduction to Social Work *(I or II, 3)* Growth and development of social work concepts, philosophies, and procedures under voluntary and public auspices. *(Lec. 3) Pre: SOC 100, 201, or 204, sophomore standing.* Maynard

313 Social Welfare Services *(I or II, 3)* Organized efforts to meet the welfare needs of individuals and groups through federal, state, and local institutions and agencies, with particular reference to Rhode Island. *(Lec. 3) Pre: 311 and one of the following: ECN 125, HIS 142, PSC 113, junior standing.* Maynard

Sociology (SOC)

Chairperson: Professor Loy (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) Not for majors.* 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 majors.* Staff (S)

201 Sociological Perspectives *(I or II, 3)* Basic principles, concepts, and methodologies in the study, description, and analysis of society. Historical development of sociology and its basic theoretical perspectives, images, and concerns. *(Lec. 3) Designed for majors.* Staff

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)* Staff (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 on the place of technology in the changing sociocultural pattern *(Lec. 3)* Staff (S)

210 Rural Sociology *(I or II, 3)* Population and culture in rural United States; emphasis on analyzing the life of the people in a rural environment as an integral part of contemporary organized society. *(Lec. 3)* Spaulding (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)* Gelles and Albert (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 *(II, 3)* Examination and analysis of major theories of deviant behavior. Application of these theories to particular types of deviant behavior. *(Lec. 3)* Gelles and Carroll (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)* Rosengren (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)* Shea (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)* Carroll and Reilly (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)* Gersuny (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 and Shea (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. *May be repeated with different topic. (Lec. 1-3) Pre: one 100- or 200-level sociology course.* Staff

301 Methods of Sociological Research I *(I and II, 3)* Scientific method in sociological research. Literature review, research design, measurement, instrument construction, sampling, evaluation research, ethics. Emphasis on logical reasoning and developing a research proposal. *(Lec. 3) Pre: 201 and junior standing.* Albert, Gelles and Shea

302 Methods of Sociological Research II *(I or II, 3)* Emphasis on the application of the principles of sociological research presented in 301. Focuses on the implementation of a study designed by the student. *Pre: 301.* Shea, Gelles and Albert

303 Laboratory for Sociology 301 *(I, 1)* Design of individual research projects to be completed in 302; development of data collection instruments; practice in various forms of data gathering *(Lab. 2) Pre: 201, junior standing, and concurrent registration in 301.* Staff

304 Laboratory for Sociology 302 *(II, 1)* Practice in computerized analysis of sociological data; introduction to common forms of data analysis with focus on individual research projects. *(Lab. 2) Pre: 201, 301, junior standing, and concurrent registration in 302.* 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.* England

316 Social Welfare Institutions *(I or II, 3)* Development of British and American welfare. Influence of ideology on welfare and poverty.