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URI Undergraduate Course Catalog 1973-1974

University of Rhode Island

Ellen M. Hull

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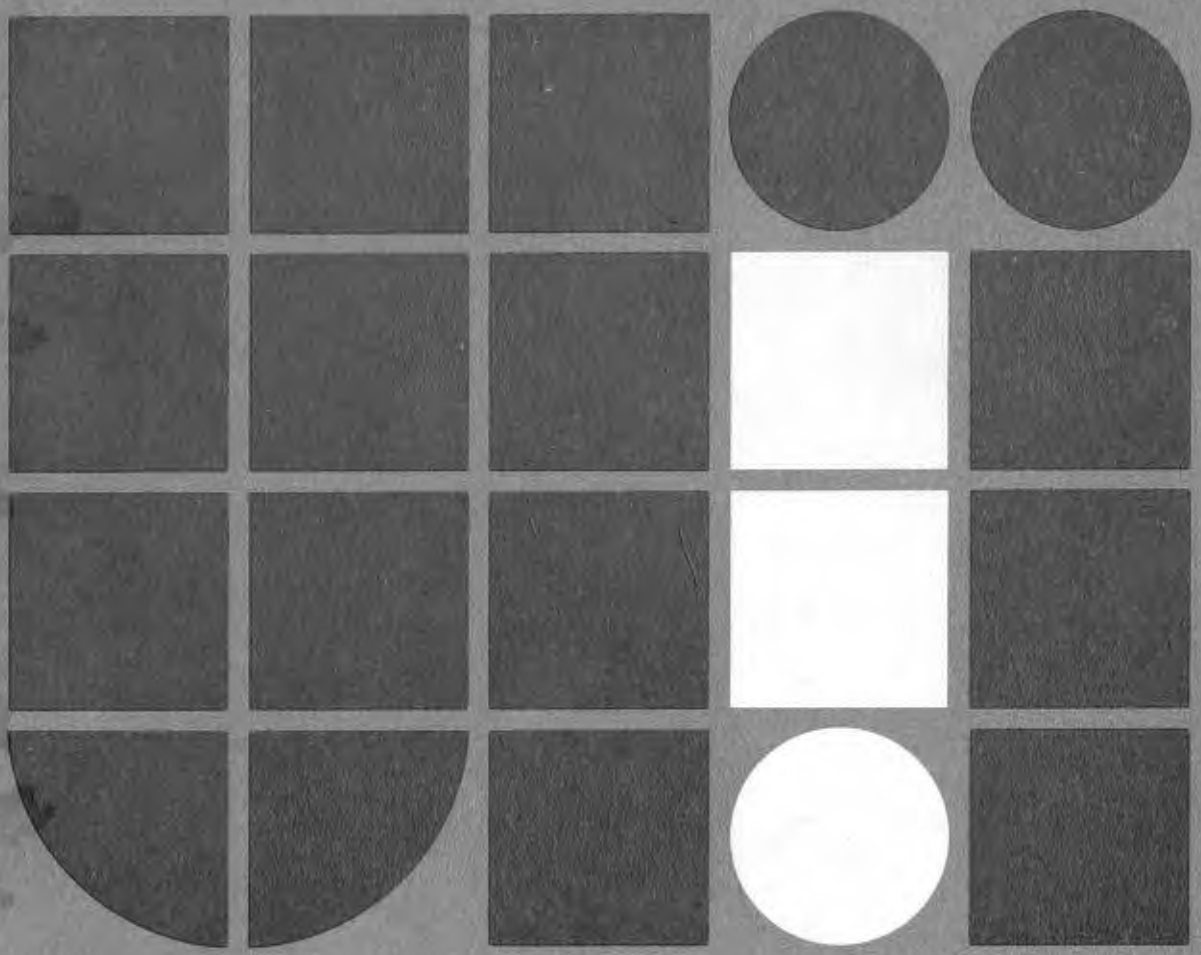
University of Rhode Island 1973•74

Undergraduate Bulletin



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Bulletin of the University of Rhode Island. Published quarterly by the University of Rhode Island, Kingston, Rhode Island 02881. Second-class postage paid at Wakefield, Rhode Island 02880.

The University

The University of Rhode Island is a coeducational state-assisted institution founded in 1892 as one of the land-grant colleges. In 1971 it became one of four sea grant colleges in the country. The University is located in the village of Kingston, in historic "South County," 30 miles south of Providence and six miles from the ocean.

The function of a university is the discovery and dissemination of truth. The University of Rhode Island carries out this function through its activities in the three major areas of instruction, research, and extension. To enable it to do so most effectively, the University has given support to the principle of freedom in inquiry and expression for both faculty and students, pointing out, however, that such academic freedom carries with it duties correlative with rights. The University holds that the common good depends upon the free search for truth and its free exposition.

Consistent with the University's land-grant tradition, preparation for a life's work and for intelligent and responsible citizenship are major goals of instruction.

All programs aim at a balance of studies in the natural and social sciences, the humanities, and professional subjects.

Undergraduate students may earn a Bachelor of Science degree in any one of the seven degree-granting colleges of the University. Study in the College of Arts and Sciences may also lead to the degree of Bachelor of Arts, Bachelor of Fine Arts, or Bachelor of Music. In the two-year programs in dental hygiene and commercial fisheries, the degree of Associate in Science is conferred.

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 26.

The teaching faculty numbers about 800, and there are over 10,500 graduate and undergraduate students at the University's main campus. About four-fifths of the undergraduates come from Rhode Island with a liberal representation from other states and foreign countries.

The University of Rhode Island is an Equal Opportunity employer.

History

The University was originally chartered as the state agricultural school in accordance with an act of the Rhode Island legislature on March 23, 1888. The Oliver Watson Farm in South Kingstown was purchased for the site of the school, and the old farmhouse, now restored, still stands on the campus today. The school became the state college by act of the state legislature on May 19, 1892, creating the Rhode Island College of Agriculture and Mechanic Arts, and the first class of 17 members was graduated in 1894.

Funds for the creation of state colleges came from the Morrill Act of 1862 which 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 objective of teaching agriculture and mechanic arts. From this grant of land comes the name land-grant colleges, applied to the national system of state colleges.

In 1909 the name of the college was changed to Rhode Island State College. The original pro-

gram of study in science, engineering and agriculture was revised and expanded. On March 23, 1951, by act of the state legislature, the college became the University of Rhode Island and the various schools became colleges within the University. In July 1970 the Board of Regents for Education succeeded the Board of Trustees of State Colleges as governing body for the state's institutions of higher learning. An historical outline may be found on page 248.

THE CAMPUS

The University's main campus encompasses 1200 acres in the village of Kingston just off R.I. Route 138. The center of the University is a quadrangle of handsome granite buildings on Kingston Hill. Surrounding this are other academic buildings, student residence halls, and fraternity and sorority houses. On the plain below are the gymnasiums, athletic fields and tennis courts, and a freshwater pond. Agriculture experiment areas, dairy barns, and greenhouses are nearby, with other facilities a mile from the central campus.

The University has two other large tracts of land: the 165-acre Narragansett Bay Campus, six miles to the east, where the Graduate School of Oceanography, the Rhode Island Atomic Reactor, and several federal laboratories devoted to the marine sciences are located; and the 2300-acre W. Alton Jones Campus, 20 miles away in West Greenwich, the site of research and conference facilities, and a Youth Science Center and camp. The Division of University Extension has a building near the State House in Providence which is headquarters for the University's adult education program.

ACCREDITATION

The courses and programs of study offered by the University of Rhode Island have been approved by national accrediting agencies and are accepted for credit toward college degrees by other approved institutions of higher learning. The national accrediting agencies which have approved the quality of the course offerings of the University of Rhode Island include the American Association of Universities, the American Association of Collegiate Schools of Business, the American Chemical Society, the American Council on Pharmaceutical Education, the American Library Association, the Engineers Council for Professional Development, the National League for Nursing, the New England Association of Colleges and Secondary Schools, and the University of the State of New York.

The University is also an approved member institution of the American Association of University Women, the Council of Graduate Schools in the United States, the National Association of Schools of Music, the National Association of Summer Sessions, and the National University Extension Association.

THE UNIVERSITY LIBRARY

The University Library is located in a four-level, air-conditioned building designed to accommodate almost half a million volumes and to provide the most advanced facilities for study and research. The open-stack arrangement permits direct access to the collection which currently numbers about 451,000 books, periodicals, documents, manuscripts, microfilm, and micro-cards. Special collections are devoted to rare books, Rhode Island history, "South County" authors and University history. The library also has a collection of long-playing records available for loan. Approximately 130,000 volumes that are classified in the Dewey system are housed across the street in Rodman Hall. Specialized libraries are located in Pastore Chemical Laboratory and in the Pell Library of the Graduate School of Oceanography.

RESIDENT INSTRUCTION

UNDERGRADUATE PROGRAMS

Undergraduates have a wide choice of programs from which they may select a concentration. These are listed below and described in detail in the chapters of this bulletin that are devoted to individual colleges. The interdepartmental programs are described in the chapter on University Programs and Requirements.

COLLEGE OF ARTS AND SCIENCES

Anthropology, Art, Biology, Botany, Chemistry, Dental Hygiene (two or four years), Economics, Education (elementary and secondary), English, French, Geography, Geology, German, History, Italian, Journalism, Latin American Studies, Mathematics, Medical Technology, Microbiology, Music, Philosophy, Physical Education (men and women), Physics, Political Science, Psychology, Sociology, Spanish, Speech, Theatre, Zoology.

COLLEGE OF BUSINESS ADMINISTRATION

Accounting, Business Education, Finance, General Business Administration, Insurance, Management Science, Marketing Management, Office Administration, Operations Management, Organizational Management and Industrial Relations.

COLLEGE OF ENGINEERING

Chemical Engineering, Chemical and Ocean

Engineering, Civil and Environmental Engineering, Electrical Engineering, Engineering Science, Industrial Engineering, Mechanical Engineering and Applied Mechanics, Mechanical and Ocean Engineering.

COLLEGE OF HOME ECONOMICS

General Home Economics; Child Development and Family Relations; Food and Nutritional Science, and Food Services; Home Economics Education; Textiles, Clothing and Related Art.

COLLEGE OF NURSING

COLLEGE OF PHARMACY

Pharmacy (five years), Ventilation Therapy.

COLLEGE OF RESOURCE DEVELOPMENT

Agricultural and Resource Technology, Animal Science, Commercial Fisheries (two years), Natural Resources, Plant Science.

INTERDEPARTMENTAL

Food Science and Technology, Urban Affairs.

GRADUATE STUDY

Graduate study is offered leading to the degrees of Master of Arts, Master of Science, Doctor of Philosophy, and the master's degree in several professional fields. Within each college's chapter in this bulletin, the related graduate degrees are listed.

The Graduate Library School which offers study leading to the Master of Library Science degree is located on the Kingston campus. Students in undergraduate and other graduate programs may, with the approval of their advisers, enroll in such library science courses as relate to their studies.

The Graduate School of Oceanography is located on the Narragansett Bay Campus of the University and offers study leading to the Master of Science and Doctor of Philosophy degrees. Instruction is limited to graduate study with the exception of one survey course at the 400-level.

A student holding the baccalaureate degree from this institution or from another having equivalent requirements may be admitted for graduate study providing that his credentials meet the standards set by the Graduate School and by the department in which he wishes to study, and that facilities for study are available in his field of interest. Among the standards required for full status 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 be admitted on conditional status. Individual departments may, however, apply admission standards which are higher than the general standards just described.

Application forms and a copy of the *Graduate School Bulletin,* which contains the detailed requirements and descriptions of advanced degree programs are available from the Dean of the Graduate School, University of Rhode Island, Kingston, Rhode Island 02881. Zip codes must be included in the applicant's return address. If, after studying the bulletin, the applicant has specific questions concerning particular degree programs or courses of instruction, these should be addressed to the chairman of the appropriate department. Applications must be returned to the Dean of the Graduate School.

Each applicant must submit (1) completed application forms in duplicate, with a $12 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 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 departments which require the advanced tests).

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 non-science students. All inquiries from international students concerning applications, fees, housing, etc., should be directed to the Director for International Student Affairs, 4 Taft Hall.

The usual deadlines for receipt of applications are April 15 for September and Summer Session admission, and November 15 for February admission.

SUMMER SESSION

The Summer Session provides educational opportunities in almost every academic department for students working at both the graduate and undergraduate levels. Students who attend both summer terms usually earn 12 credit hours, the equivalent of four-fifths of a regular semester. Increasing numbers of students are planning undergraduate programs that include sufficient summer terms for graduation in three calendar years. Many students also view the Summer Session as an opportunity to enroll in courses that their programs cannot accommodate during the academic year. In addition to the two five-week terms, a number of special programs are offered each summer. Most of these are planned to serve the specialized needs of teachers and other professionals. All summer

courses and workshops are listed in the University's *Summer Session Bulletin* published each year in March.

RESEARCH

Active programs of research are carried on throughout the University. In addition to the strong research programs in the various departments, the University has established the following programs in specially defined areas. Support comes from foundations, commercial firms, federal and state governments, and the University.

The Coordinator of Research signs, on behalf of the University, applications for research grants, maintains files of funding agencies, keeps a current facilities inventory, and in general acts as a liaison officer between the President, the business manager, the academic deans, the Research Committee and the faculty in matters pertaining to the general research policy.

AGRICULTURAL EXPERIMENT STATION

Established in 1888, the Agricultural Experiment Station is concerned with basic and applied investigation in natural and human resources. This research aims at conserving and managing resources, at improving the quality of environments, at abating pollution and recycling waste materials, at enhancing rural environments, at developing more rewarding home life, and at supporting resource-using industry and business in the region.

Research is conducted in food and resource chemistry, resource economics, plant and soil science, plant pathology and entomology, forest and wildlife management, animal science, and animal pathology. A strong orientation to estuarine and marine problems and an interdisciplinary approach to resource research are station characteristics. Current information on the progress of research is reportedly quarterly in *Rhode Island Resources*—complete results of individual projects are issued in station bulletins. All are available to Rhode Island residents upon request to the director.

BUREAU OF GOVERNMENT RESEARCH

The bureau was organized in 1960 to provide service to municipalities and to the state. It operates as an independent unit within the University. The bureau maintains a municipal consulting service which assists Rhode Island communities in dealing with problems of governmental organization and administration. It has a publications program including a research series, an information series, and a monthly newsletter, and operates a program of conferences and awards. The bureau assists in the administration of the graduate program in public administration, maintains a public administration library and provides an information service for local government units.

THE COMPUTER LABORATORY

The Computer Laboratory has an IBM system/370 model 155 with 1024K of high speed storage, disk storage units, magnetic tape, card, and printer input/output devices, and an off-line plotter. The system's hardware and software accommodate both remote batch and interactive terminal usage as well as normal batch processing. Intermediate-speed remote batch terminals are installed within the Graduate School of Oceanography and the Department of Civil and Environmental Engineering. The Department of Electrical Engineering has two PDP-9 computers with a graphics display console linked to the Computer Laboratory's system. Various types of typewriter and display terminals for interactive use or remote job entry are located on the campus in most of the science and engineering departments as well as the College of Business Administration, the College of Pharmacy, the Graduate School of Oceanography, and the Computer Laboratory. Off-campus installations include the Division of University Extension and various high schools in the state.

The staff of the Computer Laboratory develops and maintains programming systems and application programs, conducts short courses and workshops, and provides programming assistance for the University community. Staff members, who hold a joint appointment with the Department of Computer Science and Experimental Statistics, provide consultation in numerical methods, statistical analysis, and computational techniques.

DIVISION OF ENGINEERING RESEARCH AND DEVELOPMENT

This division was established in 1942 to coordinate the research activities of the College of Engineering. It disseminates the results of basic or fundamental investigations; conducts fundamental and applied research projects; provides opportunities for graduate students and highly qualified undergraduates to participate in research studies; and offers opportunities for members of the engineering faculty, through research, to keep abreast of advances in the profession.

The division is an integral part of the College of Engineering, and members of the college participate in all division projects. Facilities are available for research in the fields of chemical, civil, electrical, industrial, mechanical, materials, nuclear, environmental, and ocean engineering. Research is a requirement for all advanced degrees in engineering and the sponsored research of this di-

vision is primarily intended to provide students with the opportunity to fulfill this requirement.

GRADUATE SCHOOL OF OCEANOGRAPHY

The Graduate School of Oceanography is located on the 165-acre Narragansett Bay Campus. The land borders the shore and includes a basin and dock within easy reach of both the bay and the open ocean. The University operates several vessels, the largest of which is a 180-foot ocean-going research ship, *Trident*.

A number of buildings make up the shore facilities including laboratories, offices, the Claiborne Pell Marine Science Library and a new 12,000-square-foot research aquarium.

The research program includes basic and applied studies in physical, chemical, geological, and biological oceanography (including fishery biology).

INSTITUTE OF ENVIRONMENTAL BIOLOGY

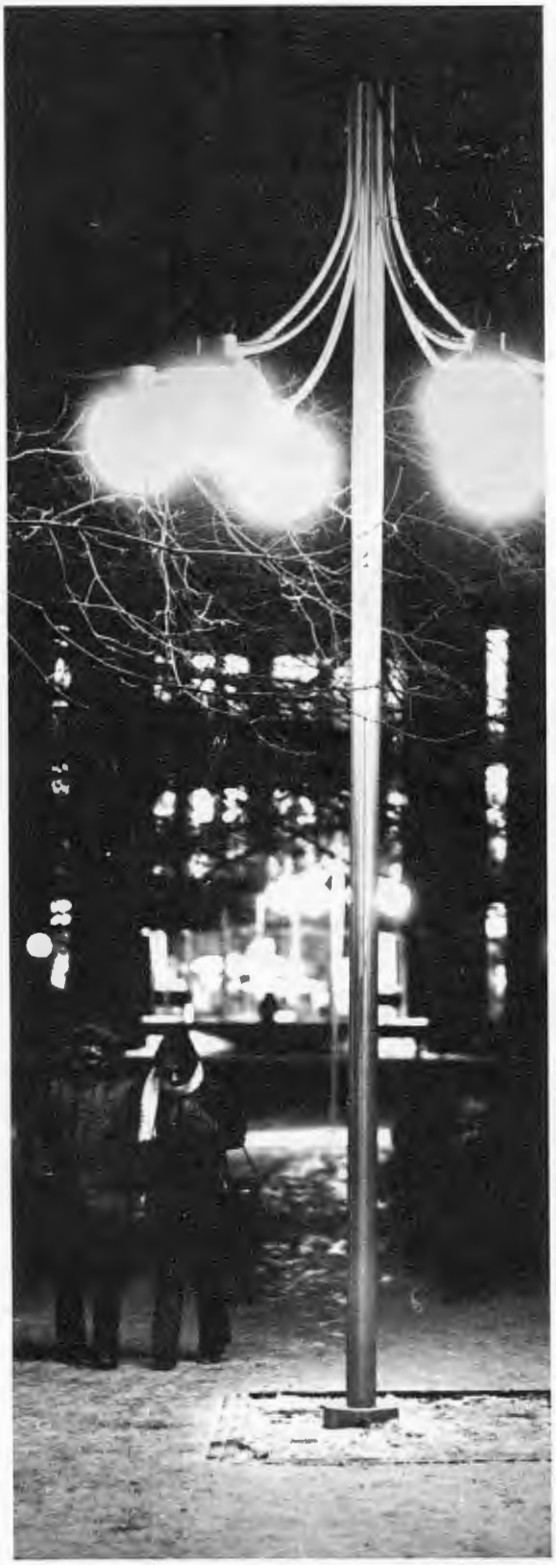
This institute provides an interdisciplinary approach to problems in environmental biology. It is an administrative organization consisting of faculty members active in graduate training and research in environmental biology, in botany, electrical engineering, forestry, oceanography, pharmacology, and zoology, and of adjunct faculty members in associated federal and private laboratories.

LABORATORIES FOR SCIENTIFIC CRIMINAL INVESTIGATION

These laboratories in the Department of Pharmacology and Toxicology of the College of Pharmacy provide instruction, research, and service in the field of scientific criminal investigation. The laboratory staff works closely with the Rhode Island Attorney General's Office and also provides technical consultation for various law enforcement agencies, and special instruction and research in criminalistics, in which faculty members of various departments participate. The program sponsors a special course for police and law enforcement agencies.

LAW OF THE SEA INSTITUTE

Established in 1965, the institute conducts summer conferences designed to elucidate legal and jurisdictional problems in ocean resource exploitation. A year-round program of research in this field is anticipated and a series of occasional publications is published. The institute is administered through the University and directed by a board composed of specialists drawn from various parts of the country.



RESEARCH CENTER IN BUSINESS AND ECONOMICS

The research activities of the College of Business Administration are centered in this organization established in 1965. The center initiates, conducts, and services research activities of the faculty in the fields of accounting, business education and office administration, business law, economics, finance, insurance, management science, marketing management, organizational management and industrial relations, and production and operations management. The center publishes the *Rhode Island Business Quarterly,* a journal whose main focus is upon the business and economic issues which directly or indirectly concern Rhode Island.

SEA GRANT COLLEGE PROGRAM

The University, in 1968, became one of the first institutions to receive broad-based support under the Sea Grant College and Program Act of 1966. Funds for a variety of marine research, education, and public service activities are administered by the Provost for Marine Affairs and a University advisory committee. Projects involve faculty and graduate students in the Graduate School of Oceanography, and in the colleges.

RHODE ISLAND WATER RESOURCES CENTER

The Rhode Island Water Resources Center, which was established in 1965, is the state center for research and training in all phases of water resources. There is a similar center or institute in each of the 50 states and Guam, Puerto Rico and The Virgin Islands, established through Public Law 88-379 in 1964. The states work cooperatively with the federal government in an effort "to assist in assuring the nation at all times of a supply of water sufficient in quantity and quality to meet the requirements of its expanding population."

Each center currently receives a federal appropriation each year to carry on its work. Congress may appropriate additional sums to match, on a dollar-for-dollar basis, funds made available to the center by the state or other nonfederal sources to meet the necessary expenses for specific water resources research projects.

Principal investigators of projects need not be employed at the University of Rhode Island; in fact centers are encouraged by the act to plan and conduct programs with such other agencies and individuals as may contribute to the solution of the water problems involved.

EXTENSION

COASTAL RESOURCES CENTER

The center is engaged in preparation of coastal and marine management plans for the state and its political subdivisions and serves as a consultant to the state Coastal Resources Management Council. Its small technical staff is based at the Narragansett Bay Campus and its work is coordinated by an executive committee under the Provost for Marine Affairs. Members of the marine faculty of the University provide special advice as needed.

COOPERATIVE EXTENSION SERVICE

An educational organization involving the federal and state governments and cooperating agencies (Eastern, Northern, Providence and Southern Rhode Island Cooperative Extension Services), the service's main function is to extend educational resources to all Rhode Islanders. It helps people identify their needs, problems and opportunities, and arrive at a promising course of action based on their desires, abilities and resources.

Extension programs are concerned with the following areas: (1) home economics provides an adult educational program for the homemaker reflecting the needs of contemporary living with emphasis on consumer and management education, clothing, housing and home furnishing, child development and human relations, and nutrition; (2) 4-H and youth programs provide activities for the development of youth toward the realization of their individual potentials as responsible citizens; (3) individual consultation and community resource development furnishes information related to home grounds, general or specialized farms, nurseries, orchards, forests, etc., and helps groups to take action to enhance the social, cultural and economic well-being of the community.

Offices of the Cooperative Extension Service are located in Providence, Olneyville, Newport, Greenville and East Greenwich.

DIVISION OF UNIVERSITY EXTENSION

The division provides adult residents of Rhode Island with an opportunity to enhance their liberal and professional education. Credit courses are offered in the sciences and the humanities, engineering, business, and home economics. Academic programs lead to the degrees of Bachelor of Science in Accounting and General Business Administration, Master of Business Administration, Master of Arts in English, Master of Public Administration, and Master of Science in Accounting. A continuing education program for women leads to the Bachelor of Arts in English, History or Psychology; or the Bachelor of Science in Home Economics Education or Child Development and Family Relations. The division operates certification programs for various professions as well as individual credit and non-credit courses. Institutes,

seminars, conferences, and short courses are planned for business, industry, labor, government, and the professions. A counseling service includes psychological testing, and group and individual guidance. The division also does research on academic and administrative questions relative to continuing education for adults.

The teaching staff is drawn from resident faculty of the University and specialists in professional and business fields. Headquarters are in the University Extension Building, Providence. Evening courses are offered in Providence, on the Kingston Campus, and in such local communities as Pawtucket, Woonsocket, Newport, Westerly, and Quonset Point. A catalog of extension courses may be obtained on request to the Division of University Extension, Promenade and Gaspee Streets, Providence, Rhode Island 02908.

International Center for Marine Resource Development

The purpose of the center is to help developing nations make and carry out sound policies for the use of their marine resources. Instituted in 1969 with funds from the federal government, the center accomplishes its mission by building programs and providing funds to educate experts in marine resource management, by fostering appropriate technical, economic and social research and by providing information and consulting services.

Marine Advisory Service

The service provides field specialists and information to the state's marine community under the public service responsibility of the Sea Grant Program. Projects include work with commercial fishermen, marina operators, local and state governments, elementary and secondary schools, marine resource managers, and individuals and businesses interested in marine enterprises. The Marine Advisory Service has headquarters at the Pell Library on the Narragansett Bay Campus.

New England Marine Resources Information Program

This regional program assists business, industry, and the public through transfer of useful scientific and technical information on ocean subjects. It consists of an information center based at the Pell Library on the Narragansett Bay Campus. The program is administered through a director and planning committee, the latter including representation from all New England states. A newsletter of interest to the New England marine community is published.

Program in Gerontology

This is a regional program for New England, and its purpose is to study the social-psychological aspects of aging, to develop programs designed to serve the aged, and to implement educational programs in social gerontology. Regional activities are coordinated through the New England Center for Continuing Education, Durham, New Hampshire. A newsletter and other publications are distributed to agencies and individuals in the field of social gerontology.

FACULTY GOVERNMENT

The Faculty Senate represents the faculty and was authorized in 1960 by the general faculty to conduct in a responsible and efficient manner the business assigned to faculty jurisdiction by the law or by the Board of Regents. The Graduate Council is the representative body for the graduate faculty in determining the academic policies for graduate study.

THE ALUMNI ASSOCIATION

Anyone who has attended the University for at least two semesters is automatically a member of the Alumni Association. The organization, which now numbers over 24,000, exists to promote the interests of the University and maintain the ties of alumni with their alma mater. The association publishes an *Alumni Bulletin* and has an annual fund drive.

UNIVERSITY OF RHODE ISLAND FOUNDATION

The University of Rhode Island Foundation was created in 1957 to encourage and administer gifts from private sources, with the primary purpose of building a substantial endowment, the income from which would assure continuing support to the University. The foundation is particularly concerned with activities of the University, its students and faculty for which adequate provision is not ordinarily made by appropriations from public funds.

University 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.

GENERAL EDUCATION REQUIREMENTS

All undergraduate students in baccalaureate degree programs at the University and in its Division of University Extension are required to select and pass 45 credits of course work from Divisions A, B, and C. Of these, 18 credits shall be taken in one division, 15 credits in a second, and 12 credits in a third. For exceptions to these requirements, see Division D and the ROTC exception below.

DIVISION A

Any course for which the prerequisites have been met in art; English (except 110, 120); languages (except 101 and 102); linguistics; literature in English translation; music (literature and history); Plant and Soil Science 242; philosophy; Theatre 100, 381, 382; and Speech 231, 331, 332. Only one studio course in art may be applied to this requirement.

DIVISION B

Any course for which the prerequisites have been met in astronomy, biochemistry, biology, biophysics, botany, chemistry, climatology (Geography 404), earth science, genetics, geology, mathematics, meteorology (Geography 403), microbiology (bacteriology-virology), oceanography, physics; statistics, and zoology.

DIVISION C

Any course for which the prerequisites have been met in Accounting 201; anthropology; economics; Education 102, 312, 403; Engineering 204; geography (except 403, 404); history; Journalism 433, 435, 438; political science; psychology (except 210, 381, 410, 434); Resource Development 100; sociology; and Speech 210, 310, 374.

DIVISION D

Students may elect up to nine credits in communications but may not reduce any other divisional requirements by more than three credits. Courses that will fulfill requirements in Division D include: Business Education 227; English 110, 120; Journalism 212, 324; Philosophy 101; Scratch OOOW, OOOX, OOOY, OOOZ; and Speech 101, 102, 215, 220.

EXCEPTION

Advanced ROTC students may apply a maximum of six credits of military science to the general education requirements. No more than three credits may be applied to any one division (A, B, or C).

OTHER ACADEMIC REQUIREMENTS

Certain basic courses are required in many cur-

riculums for transfer from University College into the degree-granting colleges at the junior-year level. These are listed in the individual college's curriculums.

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

Progress toward graduation may be accelerated by Summer Session study. A student may take two courses in each of two summer terms. Thus, in three summers he can complete about 36 credits, the equivalent of two semesters of work. A student wishing to accelerate should consult his academic adviser at the earliest possible opportunity in order to plan the sequence of his courses.

Students who desire credit for courses taken at other institutions or during Summer Session or in the Division of University Extension at the University of Rhode Island must have prior approval from their academic deans.

INTERDEPARTMENTAL STUDY

Students are encouraged to develop interests across departmental lines and several interdepartmental programs have been developed.

BLACK STUDIES

Students who desire to declare Black Studies as an area of interest (see page 33) may use the following courses to fulfill the requirements. History 150 is required for certification; other courses include Anthropology 313; English 345, 444; French 472; Geography 445; History 438, 488, 550; Political Science 408, 417; Sociology 340, 434. Permission may be obtained on an ad hoc basis to use other courses that have as their central focus one or another aspect of the black experience.

FOOD SCIENCE AND TECHNOLOGY

The University of Rhode Island is among the group of universities officially recognized by the Institute of Food Technologists as offering a curriculum in Food Science and Technology. The All-University Food Science Committee coordinates and guides the program. Participating students are enrolled in the Colleges of Home Economics or Resource Development. Students in this interdepartmental program should follow the curriculum below.

GENERAL EDUCATION REQUIREMENTS, 27 credits

These requirements are to be selected from Divisions A, C or D above.

REQUIRED COURSES

These courses fulfill the general education requirements for Division B.

Biological Sciences (10-12 credits). One course each in plant biology, animal biology and general microbiology.

Chemistry and Physics (28 credits). A two-course sequence in general chemistry, organic chemistry, and physics, and one course in analytical chemistry.

Mathematics (6 credits). One course in algebra and trigonometry, and one course in introductory calculus.

MAJOR AREA OF CONCENTRATION, 21 credits

FNS 337 Introductory Food Science
FNS 207 General Nutrition
FRC 431 Biochemistry of Foods
FRC 432 Biochemistry of Food Processing
ASC 441 Food Analysis
ASC 444 Food Quality
MIC 412 Food Microbiology

DIRECTED ELECTIVES, 18 credits

These requirements should be selected to provide further competence in the areas of food technology, food science or nutrition from the course offerings of the Departments of Animal Science, Food and Nutritional Science, Food and Resource Chemistry, and Microbiology.

FREE ELECTIVES, 18-20 credits

Total credits required: 130

URBAN AFFAIRS

The new undergraduate program in Urban Affairs consists of seven different interdisciplinary degree concentrations, three in the College of Arts and Sciences and four in professional colleges. They are designed 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 seven concentrations are: (1) Personality and Culture in the Urban Environment, (2) Policy Formation in the Urban Environment, and (3) Spatial Development in the Urban Environment in the College of Arts and Sciences; (4) Business in the Urban Environment in the College of Business Administration; (5) Urban Engineering in the College of Engineering; (6) Home Economics in the Urban Environment in the College of Home Economics, and (7) Resource Development in the

Urban Environment in the College of Resource Development.

In addition to the formal program of courses, there is practical experience in the form of internships, work-study activities, and/or research projects. Students are required, during their senior year, to participate in an interdisciplinary Senior Seminar in Urban Affairs for one semester, and they may choose to participate for a second semester. The seven programs are detailed in the appropriate college sections of this bulletin.

The Urban Affairs Program Coordinating Committee (see page 242) includes faculty members from departments throughout the University and supervises the operation of the Urban Affairs Program. With the endorsement of the faculty of the college concerned, the committee certifies completion of the concentration requirements for the appropriate undergraduate degree. A member of the committee serves as adviser for each of the seven concentrations and provides interested students with information.

PRE-PROFESSIONAL PREPARATION

Competition for places in professional schools is keen, and a superior academic record throughout college is necessary for admission to these graduate 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 undergraduate program accordingly.

Pre-law students usually major in business administration, history, political science, or economics, but students from engineering may also have the necessary prerequisites. 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 majors. The Bachelor of Arts curriculum provides specific majors for those planning to become journalists or public school teachers.

PRE-MEDICAL, PRE-DENTAL, PRE-VETERINARY

For students who plan professional study of medicine, dentistry, osteopathic medicine or veterinary medicine, guidance and program coordination is provided by the Faculty Pre-Medical—Pre-Dental Advisory Committee.

Each student should consult the prerequisites for each professional school to which he may expect to apply for admission. These are listed in *Medical School Admission Requirements,* published by the Association of American Medical Colleges, and *Admission Requirements of American Dental Schools,* by the American Association of Dental Schools, which are revised annually. Medical schools generally require a 3.2/4.0 quality-point average and high scores on the required Medical College Admission Test taken preferably in the spring of the third undergraduate year. Since only about 45 of 100 applicants to medical schools are admitted, it is wise to plan for an alternative career.

The recommendations for pre-medical preparation apply also to pre-dental and pre-veterinary students, who will be counseled by the same advisory committee. A Dental College Admission Test is required, and one or more of certain aptitude tests for veterinary medicine. Experience in agriculture and animal husbandry is expected by some veterinary medical schools.

A recommended course of study is outlined below. Underlined items are indispensable for admission to any medical school.

Chemistry. At least 16 semester-hour credits, including general inorganic, qualitative and quantitative analysis, and organic; physical chemistry is sometimes required and is frequently recommended, CHM 101, 102, 112, 114, 212, 227, 228, 229, 230 and in some cases 431 and 432, all with the associated laboratory courses.

Biology. At least 11 credits, including general animal biology, genetics, and embryology, ZOO 111 or BIO 102, 314 and ASC 352 or 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 ENG 101, 102, or Scratch, or ENG 110, 120 and a year of literature.

Modern Foreign Language. At least 6 credits.

Psychology. At least 3 credits, PSY 113.

Sociology. At least 3 credits, SOC 202.

HONORS PROGRAM

Students who achieve a cumulative average of 3.0 (after three or five semesters) may be eligible for participation in the University Honors Program. However, the Honors Program Committee may require a higher quality point average or exclude seniors who do not intend to participate in

this phase of the program. Designed to provide academic flexibility for superior students, this program is basically department-oriented and provides for a University-wide colloquium, voluntary class attendance, and an honors thesis.

DEAN'S LIST

Full-time undergraduate students who have achieved certain levels of academic excellence in any semester shall be 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 student may qualify for the *Dean's List* if he has completed 12 or more credits for letter grades in a semester. Freshmen and sophomores shall qualify by achieving a 3.0 quality point average; junior and seniors, a 3.2 quality point average.

INTELLECTUAL OPPORTUNITY PLAN

This "pass-fail" plan encourages 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 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 adviser, academic dean and the Registrar's Office in writing, prior to the end of the add period of each semester. The instructor is not informed.

Grades will be S (satisfactory) or U (unsatisfactory). The S grade is credited toward degree requirements, but not included in the quality point average. The U grade is not credited and is the equivalent of an F grade in calculation of quality points.

A student may elect up to three S/U courses each semester and up to two S/U courses during a summer.

RESERVE OFFICERS TRAINING CORPS

ROTC is an academically oriented officer education program which enables a college student to earn an Army commission at the same time he receives his college diploma. This program emphasizes military history, international relations, leadership, personnel management and administrative organization. Practical experience in leadership situations is provided to allow the student to learn by doing.

College credit is earned for all classroom instruction. Books are provided. During the last two years the ROTC cadet receives subsistence of $100 per month. Full scholarships are also available.

A modified two-year program is available to sophomores and graduate students. This program substitutes a six-week summer camp for the freshman and sophomore courses.

ROTC graduates may serve as officers in the Reserve Forces, in the Active Army for two years, or they may become career Army officers.

GRADES AND POINTS

All grades are reported as A, B, C, D, F, S or U. These marks indicate the following student standing:

A, superior.
B, good, above average but not superior.
C, average.
D, low grade, below average, passing.
F, failure.
S, satisfactory.
U, unsatisfactory.

Grades are given quality point values as follows:

A, 4 points; B, 3 points; C, 2 points; D, 1 point; F, S and U, 0 points.

A grade may be reported as "incomplete" only when failure is caused by illness or by some comparable reason not within the control of the student. Incomplete grades are subject to regulations specified in the *University Manual.*

Any course dropped after midsemester is recorded as a failure and all failures are included in the computation of quality points. Removal of failures in elective courses is not required, but removal of 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.

Certain courses do not lend themselves to precise grading and for these, only S (satisfactory) or U (unsatisfactory) shall be given to all students enrolled. Such courses are indicated by the *S/U credit* in the description and are not counted as courses taken under the Intellectual Opportunity Plan (see above).

PROBATION AND DISMISSAL

A student shall be placed on scholastic probation when his cumulative scholastic average falls below 2.0 after completing 23 or more credits, or when he has a deficiency of four (4) or less quality points below a 2.0 average after completing 22 or less credits.

A student shall be dismissed for scholastic reasons when he has a deficiency of eight (8) or more quality points below a 2.0 average after being on probation the previous semester. A student subject to dismissal shall be so notified by his dean; after which he shall have five days to file a written appeal with his dean. These rules are fully explained in the *University Manual.*

Students are expected to be honest in all academic work. A case of cheating or other form of academic dishonesty involving a penalty of suspension or dismissal from the University shall be reported by the academic dean of the college or school in which the student is enrolled to the Dean of Students who shall arrange for a hearing by the Board of Student Conduct and Scholastic Integrity. Procedures for such a hearing are described in the *University Manual.*

Copies of the *Manual* are available in the library and in deans' offices.

WITHDRAWAL FROM COLLEGE

A student wishing to withdraw from the University at any time other than at the end of a semester is required to secure a "withdrawal form" from the Office of the Dean of Students. This form, when completed, is taken to the Office of the Bursar for settlement of account.

The student who leaves the University during the course of a semester without officially withdrawing is held responsible for his registration for the semester, which means failing marks in all subjects and consequent suspension or dismissal action on his record, as well as loss of any refund privilege.

GRADUATION

To graduate, a student must have completed the work of the curriculum in which he is enrolled and also have earned a total number of quality points equal to at least twice the total number of credits for which he has registered in that curriculum.

A maximum limit of ten full semesters in one four-year curriculum will be allowed any student for graduation. Three five-week summer terms will be considered the equivalent of one semester.

Exceptions to the above requirement may be made upon recommendation by the college concerned.

Except in special cases, which shall be considered by the faculty of the college in which the student is registered, the work of the senior year must be taken in residence.

Students who attain, at the time of graduation, a cumulative quality point average (for at least one-half of their required credits at the University) of 3.3 shall be recognized as graduating with "distinction." Those who achieve a quality point average of 3.5 shall graduate with "high distinction" and those who earn 3.7, with "highest distinction."

A student who has successfully completed six semesters at the University in the curriculum in which he is registered, and then enrolls in an accredited professional college and receives a recognized professional degree, may apply for the degree of Bachelor of Science from the University of Rhode Island. The award, if approved, will be made at the next regular commencement. For veterans, only four semesters in residence are required. The other two may be fulfilled by his record in the service, evaluated in terms of University credit.

Admission and Registration

ADMISSION TO COLLEGE

The University desires that its undergraduates shall be men and women who are not only competent to do a good job in the classroom, but are also possessed of wide interests and positive qualities of character and personality. Students are selected for enrollment primarily on the basis of their academic competence without regard to age, race, sex, creed or national origin. Any person with a strong preparatory record, who possesses better than average intelligence, or who has special aptitudes or talents, should not hesitate to apply.

Candidates must meet the unit requirements of the University College as listed below for entrance to the University. Furthermore, to be prepared to enter a specific college in the sophomore or junior year, applicants are advised to complete the additional high school units recommended by the particular college to which transfer is anticipated. See page 29 for description of the University College.

Applicants are given individual consideration, but it is expected that all candidates will offer 16 units of college preparatory work as outlined below. If these requirements are not fully satisfied by secondary school certificate, they may be met wholly or in part by successful performance on appropriate examinations administered by the College Entrance Examination Board or the University.

Unit Requirements

UNIVERSITY COLLEGE

4 English
2 Algebra and/or Plane Geometry
1 Physical or Natural Science
1 History or Social Science
8 Additional units as specified below for individual colleges

Units Recommended by Colleges

ARTS AND SCIENCES

4 English
2 Mathematics
(Algebra 2, or Algebra 1 and Plane Geometry 1)
1 Physical or Natural Science
1 History or Social Science
2 Any Single Foreign Language
6 Additional

Majors in Chemistry and Physics require four units of mathematics.

Majors in Physical Education for Men may substitute other college preparatory studies for a foreign language.

BUSINESS ADMINISTRATION

4 English
3 Algebra and Plane Geometry
1 Physical or Natural Science
2 History or Social Science
6 Additional

ENGINEERING

4 English
4 Mathematics
(Algebra, Plane and Solid Geometry, and Trigonometry)

2 Physics and Chemistry
3 History, Social Science and/or Foreign Language
3 Additional

HOME ECONOMICS

4 English
2 Algebra and/or Plane Geometry
1 Science—Chemistry preferred
1 History or Social Science
2 Any Single Foreign Language
6 Additional

NURSING

4 English
2 Algebra and/or Plane Geometry
2 Other Physical or Natural Science
1 History or Social Science
7 Additional

PHARMACY

4 English
2 Algebra and/or Plane Geometry
1 Physical or Natural Science
1 History or Social Science
2 Any Single Foreign Language
6 Additional

RESOURCE DEVELOPMENT

4 English
2 Algebra and/or Plane Geometry
1 Physical or Natural Science
1 History or Social Science
8 Additional

NOTE: Additional units should be selected as far as possible from languages, history, mathematics or science.

APPLICATION PROCEDURES

Students should discuss their hopes and plans for study at the University with their academic counselors as early as possible to establish realistic goals and program selections, and to insure that their applications will receive a strong official endorsement. Admissions counselors at the University are happy to correspond with students on individual problems. Requests for application forms and information should be directed to the Office of Admissions, University of Rhode Island, Kingston, Rhode Island 02881.

Applications and requests for admissions information from foreign students should be addressed to the Director for International Student Affairs in Taft Hall at the University.

Candidates may file applications for admission to the University for entry in the fall semester in September or for entry at the start of the spring semester in February. 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 rapidly as complete credentials are submitted. However, some applicants find it to their advantage to hold their forms until senior mid-year grades are available so that their progress in the last year may be assessed by the Selection Committee. Closing date for fall term applications is March 1, and most decisions are reported in February, March, and April.

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 candidates for admission are required to take the Scholastic Aptitude Test, the English Composition Achievement Test, and at least two other achievement tests, administered by the College Entrance Examination Board in areas in which the candidate will continue his studies in college:

(a) intermediate mathematics (optionally, advanced mathematics) must be completed by students who will carry any mathematics in their freshman year at college;

(b) a foreign language test must be completed by all who plan to continue study of a language begun in high school;

(c) a laboratory science test should be completed by students who plan to follow any curriculum involving a concentration in the sciences.

Applicants are encouraged to take these tests as early as may be practicable; delay beyond the March date materially reduces a candidate's prospects for approval. Full information concerning these tests may be obtained from local high schools or by writing to CEEB Headquarters at P.O. Box 592, Princeton, New Jersey 08540.

Applicants for the curriculum in Dental Hygiene are also required to take the Dental Hygiene Aptitude Test. Full information concerning this test may be obtained from the University Office of Admissions or from the American Dental Hygienists Association, 304 East 45th Street, New York, New York 10017.

Persons applying for undergraduate admission

from a foreign country must complete an English proficiency test available at the U.S. Information Center or the U.S. Consulate, and three achievement tests selected from other languages, mathematics, laboratory sciences, or social studies.

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 fall and winter months, and students and their parents are invited to participate in these meetings to get acquainted with the University. Visitors are requested to phone ahead (401-792-2164) to be scheduled for these meetings so that adequate guide service may be provided.

ADVANCED STANDING

Advanced placement for freshmen is granted candidates who have completed college-level courses in high school as participants in the Advanced Placement Program. Decision in each case is based on a review of the candidate's record and scores on the Advanced Placement Tests of the College Entrance Examination Board. 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 submit official transcripts of all work completed and a statement of honorable separation from each institution attended in addition to the usual high school record and entrance examination score reports. Except in very unusual circumstances, candidates incurring academic or disciplinary dismissal from other colleges are not eligible for admission. Candidates accepted with transfer credit are classified as freshmen, sophomores, juniors, or seniors according to the number of credits accepted for transfer. Priority in transfer assignments is granted candidates seeking entry at the junior or senior level.

Adult students who have developed a meaningful competence in basic subject areas may demonstrate their mastery by completing the College Level Examinations sponsored by the College Entrance Examination Board. Advanced placement and a credit allowance are based on a review of the candidate's test scores and preparatory experience.

READMISSION

Students formerly enrolled at the University and seeking reentry may obtain applications for readmission at the Office of the Registrar. These must be filed by April 14 for the fall semester and December 1 for the spring semester.

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.

The following subjects have been approved for proficiency examinations: biology, botany, general chemistry, Earth Science 105 and 106, English 110, Geology 103 and 104, History 101, 102, 141, and 142, mathematics, music, physics, sociology, Speech 101, and zoology. These examinations are administered by department chairmen and results are reported to the dean's office. Students wishing to take proficiency examinations should contact the department.

PHYSICAL EXAMINATION

Every applicant accepted for admission is required to present a certificate from a physician showing that the applicant has been vaccinated against smallpox within four years and is otherwise healthy. Certificates must be returned to the University Health Services not later than two weeks prior to registration day. Eye tests and a dental examination are also recommended.

NEW ENGLAND REGIONAL STUDENT PROGRAM

Under the cooperative plan of the New England Board of Higher Education (NEBHE), the University of Rhode Island will accept qualified students from other New England states in certain specified programs of study without charging the usual non-resident tuition fee. Certain programs at other of the New England state universities are open to Rhode Islanders on a reciprocal basis. Details on the operation of this program are available on request from the New England Board of Higher Education, 40 Grove Street, Wellesley, Massachusetts 02181.

SPECIAL PROGRAM FOR TALENT DEVELOPMENT

The University encourages the application of economically and socially disadvantaged individuals from Rhode Island and has instituted a prematriculation program designed to assist such applicants whose education is below college pre-

paratory level. There is special financial provision for students in this program. Interested individuals should apply to Special Programs for Talent Development, 210 Ballentine Hall, as early as possible in their senior year in high school.

REGISTRATION

Registration for each semester consists of three separate procedures: registering for course selections, payment of fees, and obtaining a class program. No student is permitted to enroll in more than six courses or 19 credit hours in any one semester without the express written approval of his dean.

Students failing to complete registration procedures as outlined below are liable for a late registration fee of $15.

COURSE SELECTIONS

Students must obtain registration forms at the announced time and place. Currently enrolled students register in November for the spring semester, and in April for the fall semester. It is the student's responsibility to make an appointment with his adviser to consult about his program for the coming semester and then submit his completed forms during the registration period, according to the announced instructions.

New and transfer students will be instructed concerning registration procedures.

PAYMENT OF FEES

Arrangements must be made with the Bursar for complete payment of tuition and/or fees by the due date. Class programs will be issued only for those students who have registered for course selections and satisfied payment requirements with the Bursar.

CLASS PROGRAMS

Students may not attend classes without class programs. These are issued prior to the first day of classes according to instructions from the Office of the Registrar.

DROP AND ADD

Students are permitted to drop courses without a fee penalty (see page 20) during the first two weeks of classes and may add courses for two additional class days beyond these two weeks. The final day to drop courses without a failing grade is midsemester.

It is each student's responsibility to notify the instructor and/or the department if he intends to remain enrolled. Otherwise, the seat will be assigned to another student during the subsequent days of the add period.

A student who fails to appear in any class or course section, which is enrolled to capacity and for which there is a demand for seats, may be dropped by the instructor at the end of the drop period. A drop slip, signed by the instructor and countersigned by the department chairman, clearly indicating that the student has failed to appear in class is sufficient to accomplish this.

The department chairman may, in extenuating circumstances, request the Registrar to reinstate the student.

AUDIT

A full-time student who wishes to audit a course on a formal basis, which includes his name on the class roll and a notice of audit on his official transcript, must so declare to the Registrar within the add period. This includes a course added for audit or switched from regular credit enrollment to audit.

SIGNATURES

Those documents which require it must include the legal signature of the appropriate faculty member. Forgery of staff names on registration cards, drop and add cards, or other course cards will make the document invalid and may subject the student to academic discipline.

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 local, campus, or mailing address.

CONFIDENTIAL STUDENT INFORMATION

The University invites and encourages the interest of parents in the welfare and progress of students, but since students in Rhode Island are legally adults at the age of 18, it has become necessary to review practices relating to the release of information to persons outside the University, including parents. Personal information about an adult student's grades, the status of his or her health, and any disciplinary action taken is considered confidential and is not disclosed to third parties. However, such information will be released when authorized by the adult student. Of course, in emergency situations—such as a medical crisis—the University may use its discretion to inform parents, guardians, or next of kin.

Expenses and Student Aid

STUDENT EXPENSES

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

The total cost for a year of resident study at the University is about $2600 for citizens of Rhode Island and about $3550 for out-of-state residents.* These figures include $200 for books and supplies, $400 for miscellaneous personal expenses, and $50 for travel.

Students commuting to the University from their homes in Rhode Island should anticipate expenses approximating $2350 a year. This figure includes $200 for books and supplies, $700 for personal expenses and travel, and a $700 allowance for room and board at home.

All charges are payable by the semester and are due and payable on receipt of the bill. Checks or money orders should be made payable to the University of Rhode Island.

ALL STUDENTS PAY PER YEAR

General Fee	$614
Memorial Union Fee	40
Student Activity Tax	29
Accident and Sickness Insurance	13
Student Health Fee	65

STUDENTS LIVING ON CAMPUS ADD

Room Rent	550 or 650
Board—Monday Breakfast through Friday Dinner (15 meals)	570
or	
Monday Breakfast through Sunday Noon (20 meals)	640

OUT-OF-STATE STUDENTS ADD*

Tuition	$900

Resident Student Status

A student who is a resident of the state of Rhode Island does not pay the tuition fee of $900, but a student from another state or a foreign country who is in Rhode Island primarily for educational purposes, even though he remains in the state during vacation periods, is considered a nonresident and pays the $900 tuition fee.

The parents or legal guardian 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 "emanicipated 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 who are no longer under legal obligation to support or maintain him. If any of these tests is not met, he 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.

Sons and daughters of members of the armed forces, as well as members of the armed forces,

* See page 17 for exception to this under NEBHE interstate program.

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 Regents may be obtained from the Office of Admissions.

NEW STUDENT FEES

A nonrefundable fee of $12 must accompany each application for admission. See page 16 for application procedure.

A student returning after an absence of one or more semesters is subject to the same application fee. See page 17 for reapplication procedure.

All new students, both freshmen and transfer students, also pay a nonrefundable matriculation fee of $25.

GENERAL FEE

All students, both resident and nonresident, pay a general fee of $614 per year. This fee covers the cost of benefits enjoyed by all students such as use of library, testing services, guidance, personnel supervision, placement, athletics, etc.

STUDENT ASSESSMENTS

Each student is assessed $29 per year which is distributed by the Student Senate to support a wide variety of student programs and activities. A Memorial Union fee of $40 per year is also assessed.

LATE FEES

A late registration fee of $15 for the first day and $5 for each succeeding day (not including Sundays or holidays) is charged unless excused by the Registrar.

Each course dropped after the conclusion of the "drop and add" period (see page 18) incurs a $5 charge unless the student withdraws from the University. Expenses for class trips in all courses, and expenses incident to practice teaching in vocational education courses or for private music lessons, are charged to the students concerned.

TRANSCRIPTS

Each student is entitled to one official transcript without charge. For each additional official transcript, the charge is $2. Copies will be mailed in response to written requests only, which should be addressed to the Office of the Registrar.

Diplomas and transcripts will not be issued to students who have any unpaid financial obligation to the University.

HEALTH SERVICE FEES

All undergraduate students, both resident and nonresident, pay a student health fee of $65 per year.

Health Services care is restricted to minor illnesses and accidents. Students hospitalized at the Potter Building who hold meal tickets may use them to defray food expense.

All medical expenses incurred outside the University Health Services shall be the responsibility of the student.

All full-time undergraduate and graduate students are required to participate in the University's Student Medical Insurance Program, unless they can give evidence of comparable coverage in another plan. The University plan covers a 12-month period beginning in September, at an annual cost of $13. This rate is subject to change by the carrier.

REFUNDS

Refunds of payments made or credits against amounts due to the University shall be made to students who officially withdraw according to the following scale:

	Refund
First two weeks	80%
Third week	60%
Fourth week	40%
Fifth week	20%
After five weeks	None

The attendance period in which withdrawal occurs is counted from first day of registration, and includes weekends and holidays.

HOUSING RATES

Following are the rates for University housing for the year 1973-74. For complete information write to the Director of Housing, Roger Williams Commons. All rates quoted are for double rooms. For single rooms, where and when available, $50 per year is added to the double rate. Board is mandatory for students living in residence halls.

RESIDENCE HALLS

$550 Adams, Barlow, Bressler, Browning, Hutchinson, Merrow, Peck, Tucker, Weldin

$650 Aldrich, Burnside, Butterfield, Coddington, Dorr, Ellery, Fayerweather, Gorham, Heathman, Hopkins

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 semester bill. A cancellation of the housing application will result in a pro rata credit on the semester bill according to the following schedule:

	Credit
During April	$100
During May	75
During June	50
During July	25
After July	None

All residence hall rates are quoted for the period specified in the contract. Payments are due upon receipt of the bill from the Bursar's Office. Check and money orders are payable to the University of Rhode Island. A student vacating his 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.

All students living in University residence halls are required to purchase a 15-meal contract for three meals a day, Monday through Friday, for $285 per semester. A 20-meal contract at $320 per semester for three meals a day, Monday through Saturday, and brunch and dinner on Sunday, is available at the student's option. Dining contracts begin on registration day and expire the last day of final examinations. They apply each day on which the University schedules classes or examinations. Meals are not served on holidays that fall on a Monday or Friday.

Students who need special diets for health reasons are required to have their local physician submit a request for the special diet, with the diet prescribed, to the Director of Clinical Services, University Health Services. Special diets for other than health reasons cannot be provided.

Parents and guests of students, faculty and staff members, alumni, and guests of the University may purchase guest meal tickets at the dining rooms. Commuting students may contract for any combination of meals for a semester by applying at the Dining Services Office.

Meal books are issued at registration and billed according to the contract signed. Only students withdrawing from the University will receive Dining Services refunds. Please refer to page 20 for the scale.

STUDENT AID

Student financial aid is awarded without regard to age, race, sex, creed or national origin.

The Student Aid Office has complete information on the various forms of financial assistance and awards most of the scholarships and loans. A list of name scholarships and loans may be found on page 243.

The basic premise of the financial aid programs at the University is that the primary obligation to pay for education rests with the student and his family. Once the family has discharged that obligation to the best of its ability, the University makes every effort to meet the difference between the family's contribution and the student's educational costs (financial need). The University subscribes to the principles and uses the services and research of College Scholarship Service in determining a family's ability to contribute.

Students are expected to help meet the expenses of college through savings from summer earnings each year in accordance with the following schedule:

	Men	*Women*
Freshmen	400	300
Sophomores	500	400
Juniors	600	500
Seniors	600	500
Graduates	750	750

Due to the variety of financial aid programs, the Committee on Financial Aid to Students and the Student Aid Office must determine the programs for which the student is eligible and the type of aid which will be offered. All applicants for financial aid will be considered for grants (free money), loans, and employment.

APPLICATION PROCEDURE

Prefreshmen, transfer students, and other entering students should obtain a Parents' Confidential Statement (PCS) from their secondary school guidance counselor or the Financial Aid Office of the institution they are presently attending. The PCS must be completed and filed with College Scholarship Service, Princeton, N. J., by February 1 in order to meet the filing deadline of March 1.

A University of Rhode Island Application for Financial Aid will be mailed to students who are accepted for admission and have filed a PCS, where a preliminary review of the PCS indicates financial need.

Students currently enrolled obtain applications and PCS's at the Student Aid Office in accordance with procedures and deadlines published on campus.

UNIVERSITY GRANTS-IN-AID

The University holds funds which provide grant assistance to several hundred deserving students. To be awarded a grant, a student must have demonstrated financial need and have a satisfactory academic record.

UNIVERSITY LOANS

Emergency loans of small amounts are offered to help students solve emergency financial problems. These are short term in nature (30-90 days) and are made when the means of repayment are readily apparent. A separate application must be made.

FEDERAL SCHOLARSHIPS, GRANTS, LOANS, AND EMPLOYMENT

The Education Amendments of 1972 (PL92-318) have made substantial changes in the National Direct Student Loan, Supplementary Educational Opportunity Grants, and College Work-Study Programs and created a new Basic Educational Opportunity Grant Program.

The exact extent and substance of these changes and their implications will not be known until the United States Office of Education provides regulations for implementing the programs.

Federal scholarships and grants, loans and work programs are available to United States citizens and permanent residents of the United States.

Basic Educational Opportunity Grants provide $1400 minus the expected family contribution but not more than one-half the cost of attending the University of Rhode Island. Method of determining a student's eligibility and the amount of the grant will be different from existing University-based student financial aid programs.

Supplementary Educational Opportunity Grants are given to students in accordance with special requirements set by the Higher Education Act of 1965. They are specially designed for students from low-income families and are awarded in a package with loans, scholarships, and/or employment. They may be renewable each year upon application by the student.

National Direct Student Loans are available through the University from funds received from the federal government. The actual amount of the loan is determined by the student's needs and by the amount of federal funds received by the University. No interest is charged and repayment is not expected (1) while the borrower is a full-time student in college or graduate school; (2) for nine months after the completion of studies; (3) for up to three years while the borrower is in the Peace Corps, VISTA, or military service. When repayment is expected, there is an interest charge of 3 percent per year. Repayment may be made over a ten-year period, if necessary. There are provisions for cancelling all or part of the loan for certain types of teaching or military service in a combat zone.

Nursing Student Loan/Scholarship Programs are available to students enrolled in the College of Nursing. The loan program contains cancellation features for service as a nurse. Federal nursing scholarships are available to students with exceptional financial need.

Health Professions Loan/Scholarship Programs are restricted to students in the College of Pharmacy. Loans are available to all students with estimated financial need; scholarships, to those with exceptional financial need.

College Work-Study Program is a federally-supported program which provides part-time employment during the academic year and full-time employment during vacation periods with University departments and off-campus public and nonprofit, nonsectarian, nonpolitical agencies.

Other institutionally funded part-time employment is available to several hundred students.

State Guaranteed Student Loans provide loans to students from participating lending institutions in their home area. Program particulars vary from state to state. Maximum amounts available per year range from $1500 (in Rhode Island presently) to a possible $2500. Repayment is not expected until after graduation.

There are two types of these loans. On the subsidized loans the federal government pays the 7 percent interest on the loan while the student is in school. The interest subsidy is paid on the amount of loan recommended by the Student Aid Office. University of Rhode Island students seeking an interest subsidy must file a Parents' Confidential Statement (PCS) or a Students' Financial Statement (SFS).

On the non-subsidized loans the 7 percent interest is paid by the student from the date the loan is made.

Student Life and Services

An enriching collegiate experience results from a wise balance of academic and extracurricular activities. The University is fortunate in its country location, which allows space and opportunity for all sorts of outdoor activities and for a homogeneous campus life. The University has a strong student government and recognizes a wide variety of student organizations which offer to every undergraduate an opportunity to pursue his special interests and to develop qualities of leadership, character and personality. As far as possible, these organizations are operated by students and supported from a student activities fee, voted and expended by students.

Much of the undergraduate social and recreational life centers about housing units, fraternities and sororities, and the Memorial Union. A student board of directors working with the Director of Student Activities determines policy for the Union and plans a full program of social, cultural, intellectual and recreational activities.

PHILOSOPHY OF STUDENT LIFE

Upon registration at the University of Rhode Island, a student automatically becomes a member of the University community with all the rights, privileges, and responsibilities that go with membership. Such rights and privileges include full use of the educational opportunities offered, the extensive physical facilities found on the campus, the opportunity to belong to student organizations, and to participate in social, recreational, cultural and spiritual activities, and the privilege of making decisions within the scope of the University's goals as an educational institution. As in any democracy, these rights and privileges are accompanied by responsibilities: the responsibilities to progress educationally, to respect the rights of others, and to know and obey the rules and regulations developed by the University community for the good of the total membership.

STUDENT RULES

Rules and regulations for undergraduate students are explained in full in *University Policies and Regulations for Students* available in the Dean of Students Office.

UNIVERSITY OMBUDSMAN

The office of the ombudsman was created in 1972 to investigate complaints from members of the University community—students, faculty, or administrative personnel—that they have been unfairly dealt with in the normal channels of administrative process. The ombudsman office does not replace normal channels, but is used when the normal channels do not adequately respond.

The ombudsman is a tenured member of the faculty who is elected by the general faculty. He is assisted by a student who has been nominated by the Student Senate and appointed by the President of the University.

STUDENT SERVICES

DEAN OF STUDENTS

The Dean of Students' staff is concerned with the extracurricular and social life of students on the campus. They are available to consult with students regarding personal problems. The Dean of Students also serves as a counselor on veterans' educational problems.

FRESHMAN ORIENTATION

All students who have received official notice of admission as freshmen are required to attend a two-day summer orientation workshop where they learn what they can expect from the University and what the University expects from them.

During the two days students, working in small groups plan their academic programs, learn registration procedures, make new friends, discuss student life and become oriented to campus facilities and resources. The workshop staff are upperclass students who work under the supervision of the Dean of Students' Office.

PROJECT 70

Project 70 is an innovative educational program at the University. It focuses on developing a living-learning community within a residence hall on the campus and permits students to integrate residence hall life with intellectual pursuits. Over 20 accredited courses are taught in the living unit each semester. The class atmosphere is informal with small group discussion and close student-teacher relationships. About 15 students participate in classes which are held in the kitchen, classroom, and lounges of Gorham Hall, as well as out-of-doors. Classes are combined with planned social and cultural events. All programs are organized by the students and they change according to student involvement. Project 70 is under the supervision of the Dean of Students' Office.

INTERNATIONAL STUDENTS

The Director for International Student Affairs consults with and advises foreign students on academic, financial, housing, and social problems. All communications from foreign students concerning applications for admission to undergraduate or graduate programs are handled by his office. Information concerning United States laws and regulations, including employment practices, is available from the International Student Affairs staff.

COUNSELING CENTER

The Counseling Center staff assists students, generally on a one-to-one basis, with problems of personal concern. The staff psychologists and counselors are available without fee for any student who requests their services. Professional group counseling, ranging from group therapy to communication groups fostering student interaction with their peers, is provided. The center personnel treat any difficulty presented by the student in absolute professional confidence. Staff members are available as consultants to assist other faculty and staff personnel on campus in their work with students.

CAREER PLANNING AND PLACEMENT

The staff in the Office of Career Planning and Placement assists individuals, freshmen through alumni, in the assessment of their career potentials. They provide for counseling individually, in groups, and in career seminars. Services include permanent credential files as well as a career library of information and reference for occupations, specific employers, and further study. The office schedules on-campus recruiting interviews, and makes referrals and other employer listings available to registrants.

HEALTH

The University Health Services, located in the Potter Building, provides health services to all students who have paid the health fee. Services include out-patient care, limited emergency services, specialty clinics such as ENT, gynecologist, urologist, orthopedist, internist, surgeons and mental health. There are laboratory and X-ray facilities. Those who have allergies can receive allergy injections provided the vaccines are supplied. There are limited in-patient facilities.

Potter Building is staffed 24 hours a day by registered nurses and by physicians on weekdays from 9 a.m. to 5 p.m. On-call medical service is available for emergencies during hours when the physician is not on duty.

Services not provided at the Potter Building, including consultations in various specialties and hospital care, are available in the local community. All medical expenses incurred outside the University's Health Services are the responsibility of the student. Students who choose their own private physician must assume responsibility for expenses incurred.

All full-time undergraduate students are required to participate in the University's Student Sickness and Accident Insurance unless evidence of comparable coverage in another plan is provided. The University's plan covers a 12-month period beginning in September at an annual cost of $13. This rate is subject to change by the car-

rier. Spouse and dependent coverage is also available.

HOUSING

Residence halls and boarding facilities are available to students during both the regular academic year and the Summer Session. There are 19 residence halls on the campus offering a variety of living accommodations including coeducational housing.

Undergraduate study-bedrooms are furnished with desks, chairs, dressers, drapes, and single beds. Automatic laundry facilities are available in each residence hall.

Students registering for rooms in the residence halls will have their applications filled in order of receipt. Room assignments will be made to the extent of facilities, and roommate requests will be granted when possible. For rates and contracts, see pages 20 and 21.

Applications for all University housing should be made to the Director of Housing.

VISITATION POLICY

Two options are offered to students living in University residence halls, *visitation* or *no visitation*. Parental permission is required for visitation only if a student is not of legal age (18 years) on the date his visitation request is signed.

Visitation is defined as the opportunity for members of one sex to visit in the rooms of members of the other sex at any time during a 24-hour period. Visitation may not continue for longer than 24 hours. Every resident has a fundamental right to use of his own room, with the further privilege of having guests there as a negotiable agreement between roommates.

No visitation is defined as the prohibition *at all times* of any male from a female corridor or room and any female from a male corridor or room. The only exception to this regulation is made for visitations by students' parents.

The primary responsibility for enforcement of the two visitation options rests with students on each corridor with the assistance of Resident Assistants.

DINING

The three University dining rooms are operated for the convenience of the resident students, and provide wholesome food well served at reasonable prices. All students living in a University dormitory are required to take meals in a University dining room. For rates and contracts, see page 21. Parents and guests of students, faculty and staff members, alumni, and guests of the University may

be served in the dining halls, the Memorial Union, or the Faculty Center.

MEMORIAL UNION STUDENT ACTIVITIES

The Union building, which opened in 1954 as a memorial to the men of the University who died in two world wars, and was enlarged in 1965, performs a wide variety of services and houses numerous facilities designed to provide a broad social, cultural, intellectual, and recreational program.

The Union includes such facilities as meeting rooms, lounges, bowling lanes, student organizations and chaplains' offices, the University Bookstore, a restaurant, cafeteria, snack bar, pub, private dining rooms, ballroom, and party room. Additionally, substantial commuter facilities are provided to accommodate the needs of non-resident students. Services provided include an information center, barber shop, bank, travel agency, laundry pickup station, Western Union office, and record and art print libraries.

The Office of Student Activities, located in the Union building, is responsible for scheduling campus nonacademic activities, advising and assisting student organizations, and providing supporting equipment and services necessary to translate ideas into reality. Professional staff bring experience and extensive resources to this process and the major emphasis is on a creative learning experience for the students.

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 Arts Council, on which faculty, students, and administration are represented, 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 supported by student funds.

STUDENT ORGANIZATIONS

STUDENT GOVERNMENT

The Student Senate is 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 which establish and enforce rules within University guidelines. The president of each residence hall government is a member of the Residence Hall Advisory Council, which advises the Dean of Students and Director of Housing on matters pertaining to general residence hall policies and procedures.

The Interfraternity Council supervises fraternity affairs and passes regulations governing fraternity life. The Panhellenic Council does the same thing for sororities.

The Commuters Association is an organization that provides programs and assistance to commuter students.

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 and Phi Kappa Phi is the honor society for general scholarship. Mortar Board recognizes women's scholarship and leadership. In more specialized areas are the following: Alpha Kappa Delta (sociology), Alpha Zeta (agriculture), Beta Gamma Sigma (business), Kappa Delta Pi (education), Lambda Tau (medical technology), Omicron Delta Epsilon (economics), Omicron Nu (home economics), Phi Alpha Theta (history), Phi Sigma (biological science), Pi Mu Epsilon (mathematics), Pi Sigma Alpha (political science), Rho Chi (pharmacy), Scabbard and Blade (military), Sigma Delta Pi (Spanish), Sigma Pi Sigma (physics), Tau Beta Pi (engineering), and Tau Kappa Alpha (debating).

RELIGION

As befits a state university, the widest latitude is given to all creeds and religious beliefs. The University, however, does all in its power to encourage the practice of religion on campus. To the extent possible, offices for religious advisers or chaplains of various faiths are provided on campus in the Memorial Union, and facilities for religious services are also available. In addition, the Roman Catholic Center and the Episcopal Center, both adjacent to the campus, are open to all students. Synagogues and churches of various denominations in the area welcome students to their services.

Religious organizations meet regularly for worship and study, and sponsor other activities throughout the academic year. Religious organizations on the campus are Canterbury (Episcopal), Catholic Center Board of Governors, United Ministry (Protestant), Christian Science Organization, Hillel Foundation (Jewish), Lutheran Association, the URI Intervarsity Group, and the Council for

Christian Ministry which coordinates the work of the Christian groups.

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 for men and women has three pools, and a swimming program for recreation and competition is being developed.

The men's intercollegiate teams participate in baseball, basketball, football, golf, riflery, tennis, track, soccer, sailing and wrestling.

In addition to membership in the New England Conference of State Universities (Yankee Conference), the University holds membership in the National Collegiate Athletic Association and the Eastern College Athletic Conference.

The women's intercollegiate teams participate in basketball, fencing, field hockey, gymnastics, lacrosse, softball, swimming, fall and spring tennis, and volleyball. Membership in the National Association of Intercollegiate Athletics for Women, the Eastern Association of Intercollegiate Athletics for Women, two women's affiliate associations of the Amateur Fencing League of America, and the college division of the United States Field Hockey Association, give the opportunity for several teams to attend regional and national tournaments. The expansion of women's athletic programs provides increased opportunities for a high level of competition for exceptional female athletes.

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

Those with sports interests may join the several clubs identified with particular sports.

FRATERNITIES AND SORORITIES

There are approximately 1200 fraternity and sorority members in University or chapter-owned housing. The organizations are service as well as social groups serving the University and individual fraternity and sorority members by promoting scholarship, citizenship and small group living. Within the past six years ten new houses have been built in a newly opened section of the campus.

The fraternities, all of which are nationally affiliated, are Chi Phi, Lambda Chi Alpha, Phi Gamma Delta, Phi Kappa Psi, Phi Mu Delta, Phi Sigma Delta, Phi Sigma Kappa, Pi Lambda Phi, Sigma Alpha Epsilon, Sigma Chi, Sigma Nu, Sigma Phi Epsilon, Tau Epsilon Phi, Tau Kappa Epsilon, Theta Chi, and Theta Delta Chi.

The sororities, all nationally affiliated, are Alpha Chi Omega, Alpha Delta Pi, Alpha Xi Delta, Chi Omega, Delta Delta Delta, Delta Zeta, Phi Sigma Sigma, Sigma Delta Tau, and Sigma Kappa.

OTHER ORGANIZATIONS

In addition to intercollegiate athletic teams, a number of organizations represent the University in competition, exhibitions, and public performances and they are supervised by faculty coaches or directors. 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 students' academic interests and concentration areas and there are a number of groups serving social, recreational, cultural and political interests.

Students publish a semi-weekly newspaper, a yearbook, and a literary publication and operate WRIU, a campus radio station.

University College

BERNICE LOTT, *Dean*
ALICE D. GROSS, *Assistant to the Dean*

University College offers incoming students an opportunity to explore the variety of courses and programs open to them at the University before committing themselves to one college or one program of study. It has no regularly scheduled courses and grants no degrees. Students who have a clear educational or professional objective when they enter the University are encouraged to pursue that objective as directly and rapidly as possible.

The University College experience is based on a strong academic advising program. Advisers, who have regular office hours at the College, are drawn from the faculties of each degree-granting college. Each student has an adviser chosen, when possible, from a subject area in which interest has been expressed. All students are assisted by their advisers to select courses of study that will satisfy the entrance requirements of the degree-granting college and curriculum of their choice.

All entering students are enrolled in University College except those students in special two-year programs such as Dental Hygiene and Commercial Fisheries, and registered nurses wishing to earn a bachelor's degree. Students may be considered enrolled in a particular professional college *and* University College, if professional licensing or financial support requirements of the college make this desirable.

When students have met the requirements of the degree-granting college they wish to enter and have completed at least 45 credit-hours, they may transfer into that college. It is the responsibility of University College to advise students of specific courses required for transfer. No college may require a quality point average higher than 2.0.

In the few cases where enough space may not be available, the students who show promise of high academic success in a particular program will be accepted, and if possible adjustments will be made in staff and facilities to accommodate the remaining students. Those students who cannot be admitted to the program of their first choice may enter another college or program for which they are qualified or spend additional time in University College preparing to meet the entrance requirements of another program.

ADVANCED PLACEMENT AND TRANSFER STUDENTS

Students admitted to the University from an advanced placement program in high school must complete a minimum of 45 credit-hours in University College including their advanced placement credits. Students from other institutions who are transferring to the University of Rhode Island with less than 45 credits will first enter the University College. If they have earned 45 transfer credits and have met all the requirements for admission to a specific degree-granting college at the University, they may be admitted directly to that college, or they may elect to enter University College providing not more than 60 transfer credits are offered.

Requirements for admission with advanced standing are described on page 17.

College of Arts and Sciences

ROBERT LEPPER, JR., *Interim Dean*
FRANCIS X. RUSSO, *Associate Dean*
DOUGLAS M. ROSIE, *Assistant Dean*

The objective of the College of Arts and Sciences is to enable students to understand our intellectual and spiritual heritage, the physical and biological world in which we live, and man's social, economic, and political development. Beyond this, the College provides several programs of professional training and a strong foundation for graduate study. In all its functions the College is dedicated to fostering a spirit of inquiry and independent thought. Emphasis is placed upon intellectual growth and the deep satisfaction derived from knowledge for its own sake.

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*. The Department of Dental Hygiene provides programs leading to both the *Bachelor of Science* and the *Associate in Science* degrees.

For information about pre-professional preparation, see page 11.

HONORS PROGRAMS

Comprehensive honors programs are available for especially qualified junior and senior students. By providing flexibility in courses and individualized instruction, honors students are encouraged to achieve their full intellectual potentialities. Eligibility depends on the quality of academic achievement during the first two years of enrollment and upon formal recommendations by the student's concentration department and the dean of the college. Honors programs are available in biology, botany, chemistry, economics, education, English, geography, geology, history, journalism, languages, mathematics, microbiology, philosophy, physical education for women, physics, political science, psychology, sociology, speech, and zoology.

BACHELOR OF ARTS

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

CURRICULUM REQUIREMENTS

Each candidate for a Bachelor of Arts degree must meet certain minimum curriculum requirements having to do with quantity and quality. These requirements include the completion of at least 120 passed credits averaging, at graduation, C or better. On the University's grading system, that represents a cumulative quality-point average of 2.0 or higher. Of the 120 passed credits, at least 42 must be in upper-level courses, numbered 300 or above.

Each candidate must complete 45 credits of general education course work distributed in the areas of humanities, physical science and mathe-

matics, social science and/or communications. In addition, each candidate must complete a concentration and a number of elective courses. Except for elementary education, which requires 33 credits, the concentration totals 27 to 30 credits.

DISTRIBUTION REQUIREMENTS

The 45 distribution credits in general education are earned in Division A, humanities; Division B, physical sciences and mathematics; Division C, social sciences. At the student's option, 18 credits are taken in one of the divisions, 15 in another and 12 in a third.

The fourth area, Division D, communications, is optional. A student may take up to nine credits in Division D as part of the 45-credit total, but may not reduce any other divisional requirement by more than three credits.

Within each of the four divisions, no more than two courses may be taken for distribution credit in one department (discipline) or subject matter area.

To eliminate academic loads above the degree requirements, students in the advanced ROTC program may, with the approval of the dean of the college, apply a maximum of six credits of military science courses to reduce the distribution requirements.

Courses offered in the student's concentration department may not be used for distribution credits.

DIVISION A

Art. Any art course for which prerequisites have been met, not more than one of which may be a studio course.

English. Any course for which the prerequisites have been met, except ENG 110 and 120.

Language. Any course for which the prerequisites have been met, except 101 and 102.

Linguistics. Any course for which the prerequisites have been met.

Literature in English Translation. CLA 391, 392 and 393; FRN 391, 392 and 393; GER 391 and 392; ITL 391 and 392; SPA 391 and 392; RUS 391 and 392.

Music. MUS 101, 102, 221, 222, 304, 305 and only those courses for which these are prerequisite.

Philosophy. Any course for which the prerequisites have been met, except PHL 101.

Speech. SPE 231, 331, 332, 333 and 433.

Theatre. THE 100, 381 and 382.

DIVISION B

Astronomy. AST 108.

Biochemistry. BCH 311.

Biophysics. Any course for which the prerequisites have been met.

Botany. BOT 111 or BIO 101 and any course for which these are prerequisite.

Chemistry. Any course for which prerequisites have been met.

Geography. GEG 403 and 404; ESC 104.

Geology. Any course for which the prerequisites have been met, ESC 105 and 106.

Mathematics. MTH 107, 108, 109 and 141, and any course for which these are prerequisite.

Microbiology. Any course for which the prerequisites have been met.

Oceanography. OCG 401.

Physics. Any course for which prerequisites have been met.

Zoology. ZOO 111 or BIO 102 and any course for which these are prerequisite.

DIVISION C

Anthropology. Any course for which prerequisites have been met.

Economics. Any course for which prerequisites have been met.

Education. EDC 102, 312 and 403.

Geography. Any course for which prerequisites have been met, except GEG 403 and 404.

History. Any course for which prerequisites have been met, except HIS 393.

Journalism. JOR 433, 435 and 438.

Political Science. Any course for which prerequisites have been met.

Psychology. Any course for which prerequisites have been met, except PSY 300, 381, 410 and 434.

Sociology. Any course for which prerequisites have been met.

Speech. SPE 210, 301, 310, 315 and 374.

DIVISION D

Division D is limited to courses in writing and/or speaking the English language, offered by any

college in the University. Courses presently offered in fulfillment of the option are:

Business Education. BED 327.

English. ENG 110 and 120, if taken since fall, 1970.

Journalism. JOR 212 and 324.

Philosophy. PHL 101.

Scratch. SCR OOOW, OOOX, OOOY and OOOZ.

Speech. SPE 101, 102, 201, 215 and 220.

CONCENTRATION

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

The concentration (with the exception of elementary teacher education) comprises no fewer than 27 nor more than 30 credits. These, however, are exclusive of any credits outside the concentration department but which may be required by that department as prerequisites. Including such prerequisites, the concentration may not exceed 36 credits.

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

Concentration areas include:

Anthropology
Art
Biology
Chemistry
Economics
Education *elementary and secondary*
English
French
Geography
Geology
German
History
Italian
Journalism
Latin American Studies
Mathematics
Music
Philosophy
Physics
Political Science
Psychology
Sociology
Spanish
Speech
Theatre
Urban Affairs: Personality and Culture
Urban Affairs: Policy Formation
Urban Affairs: Spatial Development

MODIFIED CONCENTRATION

In consultation with his adviser, and with the approval of the dean, a student may be permitted to modify the normal requirements of the department in which he is concentrating. With such approval, the program, consisting of no fewer than 27 nor more than 30 credits, will constitute the student's concentration.

ELECTIVES

The student will elect courses sufficient in credits to complete the 120 required for graduation. Courses may be taken in any college of the University.

AREA OF INTEREST—OPTIONAL

A student may elect to declare an area of interest that will appear on his transcript of grades as a category separate from his concentration. Credits may be drawn from any combination of concentration, distribution, electives, and course-level categories. An area of interest is defined as (1) the completion of 18 or more credits of studies within a department or of related subjects offered by the student and approved by the department, or (2) of related studies offered by two or more departments and approved by the College. It is the responsibility of the student to declare his area of interest no later than the beginning of the semester he expects to graduate. No student is compelled to declare an area of interest.

BACHELOR OF SCIENCE

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

CURRICULUM REQUIREMENTS

The general curriculum for the Bachelor of Science degree consists of the general education requirements for all undergraduates, as described under Bachelor of Arts Curriculums on page 31, 12 credits of free electives, and a major of 30-45* credits within a department. In addition, a department may require for its concentration certain courses in other departments, with the stipulation that this will not preclude their application to the distribution requirements. Courses in the concentration department cannot be used to satisfy the

* The student concentrating in chemistry, for ACS accreditation purposes, will be allowed 48 credits.

distribution requirements. No more than 130* credits can be required in a program.

Each concentration within the B.S. curriculum has certain more specific requirements, as given on the following pages. These changes became effective in September 1970 and students previously enrolled in a B.S. curriculum may choose to fulfill the requirements under which they entered or to come under the new requirements.

Concentration areas include:

Botany, Microbiology, Zoology
Chemistry
Dental Hygiene
Geology
Mathematics
Medical Technology
Physical Education for Men
Physical Education for Women
Physics

BACHELOR OF FINE ARTS

These 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 concentration department. Students concentrating in art and in theatre specializing in scene design must submit portfolios. Theatre students who wish to specialize in acting must arrange for an audition with the Department of Theatre. Others must arrange for an interview with a departmental representative. Further details and appointments may be obtained through the University Admissions Office.

CURRICULUM REQUIREMENTS

In keeping with the University's general education requirements, all candidates for the Bachelor of Fine Arts degree are required to select and pass 45 credits in general education as described under Bachelor of Arts Curriculums on page 31. Within each division, no more than two courses may be taken in one department or subject matter area for general education credit. Courses in the concentration department may not be used to meet these requirements.

* The student concentrating in physical education, because of the necessity for teacher accreditation, will be allowed 136 credits.

Concentration areas include:

Art
Theatre

BACHELOR OF MUSIC

The Bachelor of Music degree is designed to prepare qualified students for careers in the field of music. The student may select one of six areas of concentration dependent upon his aims and abilities.

Concentration areas include:

Piano or Organ
Voice
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.

Concentration in 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).

CURRICULUM REQUIREMENTS

In keeping with the University's general education policy, all candidates for the Bachelor of Music degree are required to select and pass 45 credits in general education as described under Bachelor of Arts Curriculums on page 31.

Students concentrating in music education may include six credits in music to meet Division A requirements, and three credits in psychology and six credits in education to meet Division C requirements.

ASSOCIATE IN SCIENCE

The Department of Dental Hygiene offers a two-year program leading to the Associate in Science degree. The student in this curriculum is not required to take the general education courses but must complete 71 credit hours in a prescribed program outlined in the department offerings.

ANTHROPOLOGY

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

FACULTY: Associate Professor Poggie, *chairman.* Assistant Professors Lynch and Pollnac; Instructors Guthrie and Senulis.

Students desiring to concentrate in anthropology must complete 30 credits in this and related fields, including:

201 Human Origins or 202 World Prehistory		3
203 Cultural Anthropology		3
*401 History of Anthropological Theory		3
*402 Methods of Anthropological Inquiry		3

The remaining 18 credits may be selected from course offerings in anthropology. No more than 6 of these credits may be selected in 300 level or above courses in related fields. These must have approval of the student's concentration adviser.

301 Topics in Physical Anthropology
303 New World Archeology
305 Peoples of the Far East
309 Religions of Non-literate Peoples
311 Native North Americans
313 The Ethnology of Africa
315 Cultures and Societies of Latin America
†317 Archeological Methods
319 Cultural Behavior and the Environment
321 Social Anthropology
322 Anthropology of Modernization
323 Politics in Small Scale Societies
324 Peasant Societies
325 Language and Culture
405 Psychological Anthropology
407 Economic Anthropology
470 Problems in Anthropology

ART

The Department of Art offers a bachelor of arts (B.A.) degree with a concentration in either art history or art studio and a bachelor of fine arts (B.F.A.) degree in studio.

FACULTY: Professor Fraenkel, *chairman.* Professor J. L. Cain; Associate Professors M. R. Cain, Ketner, Klenk, Leete, Lindquist-Coch and Rohm; Assistant Professors Calabro, Clapsaddle, Killen, Parker and Richman; Instructors Kampen and Quinan.

BACHELOR OF ARTS

ART HISTORY

It is recommended that students intending to concentrate 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 in art history, including:

251, 252 Introduction to History of Art	6
353 Art of Egypt and Mesopotamia or 354 The Art of Greece and Rome	3
355 Early Christian and Byzantine Art or 356 Medieval Art	3
357 Italian Renaissance	3
359 Baroque Art	3
361 or 362 Modern Art	3

An additional 3 credits must be selected from the following:

265, 266 History of Asian Art
272 Pre-Colombian Art
273 African Art

An additional 6 credits must be selected from the following:

462 Modern Art Seminar: Art since 1945
469, 470 Art History—Senior Projects

Students concentrating in art history should achieve intermediate level proficiency in at least one foreign language.

ART STUDIO

It is recommended that students intending to concentrate in art studio plan to complete a minimum of 9 credits in studio by the end of the sophomore year. For graduation, students must complete 30 credits in art, including:

101 and 103 Two-dimensional Studio I and Three-dimensional Studio I	6
251 and 252 Introduction to History of Art	6
207 Drawing	3
Elective in art history	3

* APG 401 and 402, offered in alternate years, must be taken, one in the junior and one in the senior year.
† Periodically offered during Summer Session for 6-credit hours and taught as a field school utilizing the theory and methods of archeology to the discovery, excavation and analysis of a prehistoric site in the New England region.

An additional 6 credits must be selected from the following:

221 and 322 Two-dimensional Studio II and III
231 and 332 Printmaking I and II
233 and 334 Graphic Design I and II
243 and 344 Three-dimensional Studio II and III

An additional 6 credits must be selected from the following:

403 and 404 Studio-Seminar I and II
405 and 406 Studio-Seminar III and IV
469 and 470 Art History—Senior Projects

ART 120 may not be counted toward degree requirements if ART 251 and 252 have been previously completed. A minimum of 9 credits of non-studio study in art is required. It is recommended that art majors elect at least 3 credits in the allied fields of music or theatre. Students following curriculums in effect before fall, 1970, may use up to 9 credits of electives for further courses in art without increasing their total graduation requirements.

BACHELOR OF FINE ARTS

It is recommended that students intending to enter the B.F.A. program in art plan to complete a minimum of 12 credits in studio by the end of the sophomore year. Students in the B.F.A. program must complete a minimum of 48 credits in art. Studio courses required of all majors include:

101 Two-dimensional Studio I	3
103 Three-dimensional Studio I	3
207 Drawing I	3
208 Drawing II	3

Outstanding entering students may, upon recommendation of their adviser and approval of the art faculty, be excused from any or all of the courses in this section and substitute upper level courses for these credits. Normally, however, most students will be required to take these courses.

An additional 6-15 credits must be selected from studio courses numbered below 400.

An additional 12-21 credits must be selected from studio courses numbered above 400 with at least 6 credits in ART 403 and/or 404, and at least 6 credits in ART 405 and/or 406. Courses with variable credit loads must be elected in 3-credit multiples. Thus, a 3-9 credit course may be elected for 3, 6, or 9 credits only.

An additional 9 credits must be selected in art history. Students anticipating graduate study in art should note that some graduate schools require 12 credits in art history for entrance.

Student work accomplished as part of a course may, with the consent of the student, be retained by the Department of Art for teaching or exhibition purposes. When this work is no longer useful to the department, the student will be notified so it may be reclaimed within 60 days. Student works selected by the art faculty for inclusion in the permanent collection of the University may be purchased through negotiations with the student.

This program applies to new students who have entered since the fall of 1970. Students enrolled in B.F.A. programs may use the electives remaining after completion of the general education and concentration requirements to increase their art credits without increasing total graduation requirements.

DISTRIBUTION OF CREDITS

General education requirements	45
Major requirements	
Studio	39
Art history	9
Electives	27

Total credits required: 120

BIOLOGICAL SCIENCES

Programs in biological sciences are administered by the Departments of Botany, Microbiology and Biophysics, 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 Goos, *chairman*. Professors Albert, Caroselli, Hauke, Lepper, Palmatier, Smayda and R. D. Wood; Assistant Professors Halvorson, Hargraves, Harlin, Mottinger and Swift; Adjunct Professor Simmons.

MICROBIOLOGY AND BIOPHYSICS FACULTY: Professor N. P. Wood, *chairman*. Professors P. L. Carpenter, H. W. Fisher, Houston and Sieburth; Associate Professors P. S. Cohen and Hartman; Adjunct Professor Cabelli; Adjunct Associate Professor Prager; Special Instructor Cece.

ZOOLOGY FACULTY: Professor Chipman, *chairman*. Professors Hammen, R. W. Harrison, K. E. Hyland, Saila, Winn and Zinn; Associate Professors Constantino, Goertemiller, Heppner, Hill, Krueger, Mathewson and Shoop; Assistant Professors Bibb and Cobb; Adjunct Professors Bass, Carriker, Dowling, Gibbs, Hutchison, Schaefer and Surver; Special Instructor Doolittle.

BACHELOR OF ARTS

Students selecting a concentration 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 201	4
Botany (exclusive of BOT 111)	6
Zoology (exclusive of ZOO 111)	6

The remaining 4-6 credits may be selected from one or all of the areas in biology. Students in this concentration must elect a year of chemistry. Those wishing to prepare for a career as a professional botanist, microbiologist, or zoologist should enroll in the bachelor of science curriculum in biology described below.

BACHELOR OF SCIENCE

This curriculum provides specialization in the fundamental principles of botany, microbiology, or zoology, and it is concerned with the application of biological science to problems of modern life. It also provides preparation for graduate work in biological fields and for admission to professional schools of medicine, dentistry, and veterinary medicine.

By the end of the sophomore year, the students must select a concentration in botany, microbiology, or zoology.

BOTANY

A minimum of 30 credits in botany is required and must include BOT 111, 221, 262, 323, 352, 411, 445, and 416 or 432. In addition, the student must take MIC 201; CHM 101, 102 or 103, 105, 112, 114, 227, 229, 228 and 230; PHY 213, 285, 214, 286 or 111 and 112; ZOO 111; ENG 110; SPE 101 or 102; MTH 141 and 142.

MICROBIOLOGY

A minimum of 30 credits in microbiology is required, including MIC 201. The student concentrating in microbiology may include any course in microbiology; APA 534, 536 and 538; ASC 352 and 354; BOT 416, 432, and 543; OCG 567; PLP 561; ZOO 331, 441, and 512. A student who plans to attend graduate school should take MTH 141 and 142 and CHM 331 and 332. In addition, the student must take BOT 111; ZOO 111; CHM 101, 102 or 103, 112, 114, 227, 229, 228, 230 and 212; BCH 311; PHY 213, 285, 214 and 286 or 111 and 112; MTH 109 or 141 and 141 or 142; and a modern language to the intermediate level.

ZOOLOGY

A minimum of 30 credits in zoology is required

and must include ZOO 111, 262, 314, 345, 354, and 395; ASC 352 or BOT 352. In addition, the student must take BOT 111; CHM 101, 102 or 103, 105, 112, 114, 227, 229, 228 and 230; MTH 141 and 142; PHY 111 or 112 or 213, 285, 214, and 286 or 111 and 112; and a modern language to the intermediate level.

FRESHMAN YEAR

First Semester

BOT 111 General Botany or ZOO 111 General Zoology	4
CHM 101, 102 General Chemistry or CHM 103, 105 General Chemistry	4
MTH 109 Algebra and Trigonometry or MTH 141 Introductory Calculus with Analytical Geometry	3
*Modern language or elective	3
General education requirement or free elective	3
	17

Second Semester

BOT 111 General Botany or ZOO 111 General Zoology	4
CHM 112, 114 General Chemistry	4
MTH 141 Introductory Calculus with Analytical Geometry or †MTH 142 Intermediate Calculus with Analytical Geometry	3
*Modern language or elective	3
General education requirement or free elective	3
	17

SOPHOMORE YEAR

First Semester

**MIC 201 General Microbiology	4
CHM 227, 229 Organic Chemistry	4
General education requirements or free electives	9
	17

Second Semester

Curriculum requirements	3-4
CHM 228, 230 Organic Chemistry	4
General education requirements or free electives	9
	16-17

Total credits required: 130

* Not required of botany majors.
† MTH 142 is required of botany and zoology majors.
** Not required of zoology majors.

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 Goodman, *chairman.* Professors Abell, Cruickshank, Kraus, S. MacKenzie, Rosie and Vittimberga; Associate Professors C. W. Brown, Gonzalez, Nelson and Petersen; Assistant Professors Cheer, Fasching, Hamlet, Kirschenbaum and Rosen.

BACHELOR OF ARTS

Students selecting this field of concentration must complete a minimum of 28 credits in chemistry, including:

101, 102 or 103, 105 General Chemistry I	4
112, 114 General Chemistry II	4
212 Quantitative Analysis	4
227, 229 Organic Chemistry I	4
228, 230 Organic Chemistry II	4
431, 432 Physical Chemistry	6
335 or 336 Physical Chemistry Laboratory	2

PHY 111 and 112 and two years of mathematics are strongly recommended.

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 follow the teaching profession, and 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.

FRESHMAN YEAR

First Semester

CHM 191 General Chemistry	5
MTH 141 Introductory Calculus with Analytical Geometry	3
*Language or free elective	3
General education requirements	6
	17

Second Semester

CHM 192 General Chemistry	5
MTH 142 Intermediate Calculus with Analytical Geometry	3
*Language or free elective	3
General education requirements	6
	17

SOPHOMORE YEAR

First Semester

CHM 227, 229 Organic Chemistry	4
MTH 243 Calculus and Analytical Geometry of Several Variables	3
PHY 213 Elementary Physics	3
PHY 285 Physics Laboratory	1
*Language or free elective	3
General education requirement	3
	17

Second Semester

CHM 228, 230 Organic Chemistry	4
MTH 244 Differential Equations	3
PHY 214 Elementary Physics	3
PHY 286 Physics Laboratory	1
*Language	3
General education requirement	3
	17

JUNIOR YEAR

First Semester

CHM 431 Physical Chemistry	3
CHM 335 Physical Chemistry Laboratory	2
CHM 425 Qualitative Organic Analysis	4
Physics elective	3
General education elective	3
	15

Second Semester

CHM 432 Physical Chemistry	3
CHM 336 Physical Chemistry Laboratory	2
CHM 412 Instrumental Methods of Analysis	3
CHM 414 Instrumental Methods of Analysis Laboratory	2
General education electives	6
	16

SENIOR YEAR

First Semester

CHM 401 Inorganic Chemistry	3
†Curriculum requirements	3-6
Free electives	9-6
	15

Second Semester

CHM 392 Seminar in Chemistry	1
†Curriculum requirement	3-0
Free electives	12-15
	16

Total credits required: 130

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

† CHM 353, 354 or any 400-level or, with permission of the department, any 500-level course in chemistry.

COMPUTER SCIENCE AND EXPERIMENTAL STATISTICS

The Department of Computer Science and Experimental Statistics does not offer a program at the bachelor level but does provide courses for students in other programs. The master of Science (M.S.) degree programs in computer science or experimental statistics are described in the *Graduate School Bulletin.*

FACULTY: Professor Hemmerle, *chairman.* Professors Merenda and L. T. Smith; Associate Professors Carney and Lawing; Assistant Professors Bass, Carrano, Hanumara, Tetreault and Weiderman.

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 Council on Dental Education of the American Dental Association.

FACULTY: Associate Professor B. Wilson, *chairman.* Instructor L. Owen; Special Instructor E. Ladd; and visiting and affiliated staff on page 236.

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 student 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 concentration of 30 credits in dental hygiene includes:

101 Orientation to Dental Hygiene	1
125 Oral Anatomy	3
135 Prophylactic Techniques Laboratory	1
141 Dental Assisting	1
126 General and Oral Histology and Embryology	3
128 Periodontics	1
136 Dental Hygiene Clinic	2
227 General and Oral Pathology	3
231 Roentgenology	2
237 Dental Hygiene Clinic	2
238 Dental Hygiene Clinic	2
244 Dental Materials and Operative Technique	1
246 Ethics, Jurisprudence and Office Management	1
250 Dental Health Education	2
252 Public Health	2
254 Survey of Dental Specialties	1
260 Preventive Dentistry	2
	30

In addition, candidates for the Bachelor of Science degree are required to take the following courses:

CHM 101, 102 or 103, 105 General Chemistry	4
CHM 124 Organic Chemistry	4
ENG 110 Composition	3
ENG 120 Literature and Composition	3
ZOO 121 Human Anatomy	4
ZOO 242 Introductory Human Physiology	3
ZOO 244 Introductory Human Physiology Laboratory	1
PEW 172 First Aid	1
MIC 201 General Microbiology	4
SOC 202 General Sociology	3
SOC 204 Social Psychology	3
FNS 207 General Nutrition	3
PCL 221 Dental Therapeutics	2
PSY 113 General Psychology	3
PSY 232 Developmental Psychology	3
SPE 101 Fundamentals of Oral Communication	3
EDC 102 Introduction to American Education	3
EDC 312 The Psychology of Learning	3
EDC 371 Educational Measurements	3
MTH 107 Introduction to Finite Mathematics	3
	59

Total credits required: 125

ASSOCIATE IN SCIENCE

This two-year curriculum is designed to prepare 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

CHM 101, 102 or 103, 105 General Chemistry	4
ENG 110 Composition	3
ZOO 121 Human Anatomy	4
DHY 101 Orientation to Dental Hygiene	1
DHY 125 Oral Anatomy	3
DHY 135 Prophylactic Techniques Laboratory	1
DHY 141 Dental Assisting	1
	17

Second Semester

ENG 120 Literature and Composition	3
CHM 124 Organic Chemistry	4
ZOO 242 Introductory Human Physiology	3
ZOO 244 Introductory Human Physiology Laboratory	1
PEW 172 First Aid	1
DHY 126 General and Oral Histology and Embryology	3

DHY 128 Periodontics	1
DHY 136 Dental Hygiene Clinic	2
	18

SOPHOMORE YEAR

First Semester

MIC 201 General Microbiology	4
SOC 202 General Sociology	3
FNS 207 General Nutrition	3
PCL 221 Dental Therapeutics	2
DHY 227 General and Oral Pathology	3
DHY 231 Roentgenology	2
DHY 237 Dental Hygiene Clinic	2
	19

Second Semester

PSY 113 General Psychology	3
SPE 101 Fundamentals of Oral Communication	3
DHY 238 Dental Hygiene Clinic	2
DHY 244 Dental Materials and Operative Technique	1
DHY 246 Ethics, Jurisprudence and Office Management	1
DHY 250 Dental Health Education	2
DHY 252 Public Health	2
DHY 254 Survey of Dental Specialties	1
DHY 260 Preventive Dentistry	2
	17

Total credits required: 71

ECONOMICS

The Department of Economics offers a bachelor of arts (B.A.) degree. The master of arts (M.A.) in economics and doctor of philosophy (Ph.D.) in economics (interdepartmental), offering study in the economics of the utilization of marine resources, are described in the *Graduate School Bulletin.*

FACULTY: Professor Sabatino, *chairman.* Professors Dirlam, Haller, Hellman, Rayack and Schurman; Associate Professor O. O. Brown; Assistant Professors Barnett and Starkey; Instructors Hume and Suzawa; Special Instructor Latos.

Students selecting this field of concentration must complete a minimum of 27 credits in economics, including:

*125, 126 Economic Principles	6
361 Survey of Economic Thought	3
327, 328 Intermediate Economic Theory	6

In addition, at least four courses (12 credits)† must be completed from the following:

300 Radical Critiques of Contemporary Political Economy
302 Economic Development of the United States
334 Money and Banking
337 Business and Government
342 Public Finance
363 Economic Growth and Development
375 Introduction to Quantitative Methods I
376 Introduction to Quantitative Methods II
401 Poverty in the United States
402 Urban Economics
438 International Trade and Policy
451, 452 Assigned Work
464 Comparative Economic Systems
MGT 321 Labor Problems
BST 201, 202 Elementary Statistics
EST 411, 412 Statistical Methods in Research I, II

EDUCATION

The Department of Education offers the bachelor of arts (B.A.) degree in teacher education. The master of arts (M.A.) degree programs in education are described in the *Graduate School Bulletin.*

FACULTY: Professor MacMillan, *chairman.* Professors Aukerman, Casey, Nally, Rife and Russo; Associate Professors Croasdale, Heisler, P. Kelly, W. Kelly, May, McGuire, L. McKenzie, Pascale, Purnell and Soderberg; Assistant Professors Allen, Bumpus, Calabro, Cresser, Fechek, Flugsrud, Gunning, Hagey, Howard, Kellogg, Long, Maynard, McCreight, McKinney, Nagel, Nelson, O'Neill, Pezzullo, Schaffren, Sullivan, Whitcomb and Willis; Lecturer Quinn; Research Associate Rieser.

The curriculums in elementary and secondary teacher education offer a balanced program of academic preparation and professional training. The required professional courses contribute directly both to teaching skills and to the teacher's function in carrying out the role of the school in society.

In both curriculums, students must complete PSY 113 General Psychology and PSY 232 Developmental Psychology.

* Students who have taken ECN 123 may enter ECN 126 without taking ECN 125, they cannot take ECN 125.

† Students planning to do graduate work in economics are strongly advised to take ECN 375, 376, and a year of statistics.

The following education courses are required in the professional sequence:

103	Introduction to Education	3
313	Psychology of Learning	3
372	Educational Tests and Measurements	3
484	Supervised Student Teaching	12
485	Seminar in Teaching	3

In addition, secondary education students will take EDC 430 Methods and Materials in Secondary Education; elementary education students will take EDC 329 Music for the Elementary School Teacher and EDC 427, 428 Child and Curriculum I and II.

All students in education will, in cooperation with their advisers, develop a 27-30 credit sequence of courses to meet the teacher certification requirement for competence in a subject area. They must achieve a 2.20 quality point average by the end of the sophomore year and maintain it. They must also attain at least a C in EDC 430 or EDC 427, 428 to be placed for student teaching. Failure to meet these two conditions will lead to automatic dismissal from the program.

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*.

FACULTY: Professor J. Y. Miller, *chairman*. Professors Goldman, Gullason, Hoffmann, A. MacLaine, Neuse, Petrie, Potter, E. A. Robinson, W. D. Smith and Sorlien; Associate Professors Barker, J. M. Marshall, Mathews, Seigel, Sharpe, Steeves, R. H. Tutt and White; Assistant Professors S. F. Burke, Campbell, Cane, B. Collins, Donnelly, Dvorak, M. Hills, Jacobs, Joel, Kunz, Malina, McCabe, C. M. Murphy, Reaves, Ryan, Schoonover, Towers and R. M. Tutt; Instructors Mensel, Stein and D. Titus.

Students selecting this field of concentration must complete a minimum of 30 credits in English. The following requirements pertain only to these first 30 credits:

Three courses (9 credits) on the 200-level, the maximum on this level being four courses (12 credits).

Balance of courses on the 300-, 400- or *500-level, including a minimum of three courses (9 credits) on the 400-level or above.

* Undergraduates wishing to take these courses *must* secure permission of the instructor.

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 described in the *Graduate School Bulletin.*

FACULTY: Associate Professor Kossoff, *chairman* (Department of Languages); Assistant Professor Toloudis, *section head.* Professors Porter and Waters; Associate Professors Demers, J. Hyland and Rothschild; Assistant Professors Benson, Chartier, C. Driver, Kuhn, Morello and Rogers.

Students selecting this field of concentration are required to complete 30 credits in French courses numbered 103 or higher, of which no less than 9 are to be taken in literature. Courses in literature may be selected from among FRN 325, 326, courses at the 400-level, and, with permission of the instructor, courses at the 500-level. Courses in linguistics may also count toward the concentration.

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

GEOGRAPHY

The Department of Geography offers the bachelor of arts (B.A.) degree. The master of arts (M.A.) program in geography is described in the *Graduate School Bulletin.*

FACULTY: Professor Alexander, *chairman.* Professors Higbee and Michel; Associate Professor Havens; Assistant Professors Brand, Capelle and Gamble; Instructor Cameron.

Students selecting this field of concentration must complete a minimum of 29 credits, including:

* 100 Human Ecosystems or * 103 Economic Geography or * 121 Cultural Geography or * 131 Political Geography	9
411 Urban Geography or 412 Seminar in Urban Geography	3
421 Cartography	3
491, 492 Special Problems in Geography	6
ESC 104 Geographical Earth Science	4
ESC 105, 106 Geological Earth Science	4

* Students select any three of these 100-level courses.

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 Cain, *chairman.* Associate Professors Hermes and Tynan; Assistant Professors J. J. Fisher and Hampton; Lecturer Sage.

BACHELOR OF ARTS

Students selecting this field of concentration must complete a minimum of 27 credits in geology, including:

103 Physical Geology	3
104 Historical Geology	3

105, 106 (ESC 105, 106) may not be included.

Students intending to pursue graduate work in the geosciences should consider the B.S. curriculum in geology.

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

BACHELOR OF SCIENCE

This curriculum is designed as a basic foundation for graduate study and careers in the earth sciences. In addition to training for research and teaching opportunities in geology, it offers preparation for further work in geochemistry, geophysics, paleontology, paleoecology, mineral resources, engineering geology, environmental geology and oceanography.

An emphasis in 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 chairman of the Department of Geology.

Students concentrating in geology should note the requirement for field experience. A summer field camp normally is undertaken following the junior year and related costs are the responsibility of the student.

FRESHMAN YEAR

First Semester

*MTH 109 Algebra and Trigonometry	3
GEL 103 Physical Geology	3
BOT 111 General Botany or BIO 101 General Biology	4-3
General education requirements	6
	16-15

Second Semester

*MTH 141 Introductory Calculus with Analytic Geometry	3
GEL 104 Historical Geology	3
ZOO 111 General Zoology or BIO 102 General Biology	4-3
ESC 101 Principles of Earth Science	4
General education requirement	3
	17-16

SOPHOMORE YEAR

First Semester

CHM 101, 102 General Chemistry or CHM 103, 105 General Chemistry	4
*MTH 142 Intermediate Calculus with Analytic Geometry	3
PHY 213, 285 Elementary Physics or PHY 111 General Physics	4
GEL 410 Geomorphology	3
General education requirement	3
	17

Second Semester

CHM 112, 114 General Chemistry	4
PHY 214, 286 Elementary Physics or PHY 112 General Physics	4
Elective	3
General education requirements	6
	17

JUNIOR AND SENIOR YEARS

In addition to the remainder of the general education requirements and free electives, the following geology courses are required:

410 Geomorphology (if not taken in sophomore year)	3
420 Mineralogy	3
421 Optical Mineralogy	3
430 Petrology	3
440 Introduction to Paleontology	3
450 Introduction to Stratigraphy and Sedimentation	3
470 Structural Geology	3
Approved summer camp (between junior and senior years)	4

Students must also take an approved course in statistical methods or computer science and 12 credits of science electives which constitute an integrated group in earth science. These are selected in consultation with the faculty adviser.

Total credits required: 122

* Students with adequate preparation in algebra and trigonometry may take MTH 141 in the first semester and MTH 142 in the second semester of the freshman year.

GERMAN

The Department of Languages offers the bachelor of arts (B.A.) degree with a concentration in German.

FACULTY: Associate Professor Kossoff, *chairman* (Department of Languages); Professor B. A. Woods, *section head.* Professor F. L. Woods; Associate Professor Dornberg; Assistant Professors Grandin and Kaline; Instructor Myers.

Students selecting this field of concentration complete at least 30 credits in German not including GER 101, 102 or GER 391, 392. GER 205, 206 or equivalent is prerequisite to the courses on the 400-level. LIN 409, 410 may be used for concentration credit.

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 Findlay, *chairman.* Professors Klein, Metz, Thomas and Weisbord; Associate Professors Briggs, Cohen, Gutchen and Kim; Assistant Professors Brown, Bryan, Costigliola, Daniel, Kantor, Honhart, Roughton, Silvestri, Strom and Thurston; Instructor Higgins.

Students selecting this field of concentration 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 in courses numbered 300 or above, including one undergraduate

seminar, HIS 395. Under unusual circumstances, with permission of the chairman 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.

ITALIAN

The Department of Languages offers the bachelor of arts (B.A.) degree with a concentration in Italian.

FACULTY: Associate Professor Kossoff, *chairman* (Department of Languages); Assistant Professor Viglionese, *section head.* Professor Capasso; Instructors Marcheschi and Trivelli.

Students selecting this field of concentration complete at least 30 credits in Italian not including ITL 101, 102, 391 or 392. LIN 409, 410 may be used for concentration credit.

JOURNALISM

The Department of Journalism offers the bachelor of arts (B.A.) degree.

FACULTY: Associate Professor Batroukha, *chairman.* Associate Professor Doctor; Assistant Professors D. L. Anderson, Nwankwo and J. Thompson.

Students selecting this field must complete a minimum of 30 credits in journalism, as follows:

210	Introduction to Mass Communications	3
212	News Writing and Reporting	3
325	Copy Editing	3
326	Advanced Reporting	3
334	History of Journalism in the U.S.	3
361	Internship in News Writing and Reporting	3
434	Contemporary Press Problems	3
436	Fundamentals of Communication Research	3
438	Government and Legal Aspects of Mass Communications	3
440	Criticism, Opinion and Interpretation in the Mass Media	3

LANGUAGES

In addition to the bachelor of arts (B.A.) degree concentrations in French, German, Italian and Spanish languages and in Latin-American

studies, described in alphabetical order in this chapter, the Department of Languages provides courses in Classics, Greek, Latin, Linguistics, Portuguese and Russian.

FACULTY for these courses: Associate Professor Kossoff, *chairman*. Professors Porter and F. L. Woods; Assistant Professors Aronian, Cashdollar, McNab and Rogers; Instructor Campbell.

LATIN AMERICAN STUDIES

The Departments of Art, History, Languages, and Sociology and Anthropology offer a bachelor of arts (B.A.) degree in Latin American studies.

Students selecting this field of concentration must complete a minimum of 30 credits in the principal areas of art, history, languages and anthropology-sociology, any other disciplines offering relevant courses, and an interdisciplinary seminar. To assist the student, there is a Committee of Latin American Studies with members from the participating departments. The student should seek a committee member to help him in the formulation and approval of his concentration.

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: Associate Professor Ladas, *chairman*. Professors Haggerty, Lakshmikantham, Roxin and Suryanarayan; Associate Professors Datta, Driver, Fraleigh, Schwartzman, Sine and Verma; Assistant Professors Barron, Beauregard, R. Caldwell, Finizio, Grove, Lew and P. T. Liu.

BACHELOR OF ARTS

Students selecting this field of concentration must complete 30 credits in mathematics, including:

141 Introductory Calculus with Analytic Geometry	3
142 Intermediate Calculus with Analytic Geometry	3
215 Introduction to Algebraic Structures	3
243 Calculus and Analytic Geometry of Several Variables	3
316 Algebra	3
335 Advanced Calculus I	3
336 Advanced Calculus II	3

Six credits are to be selected from the following:

322 Concepts of Geometry	3
353 Foundations of Mathematics	3
425 Topology	3
444 Ordinary Differential Equations	3
451 Introduction to Probability and Statistics	3
462 Functions of a Complex Variable	3

It is strongly recommended that students considering graduate study in mathematics take MTH 425 and 462.

MTH 107 Introduction to Finite Mathematics, 108 Topics in Mathematics, 109 Algebra and Trigonometry, and 125 Fundamentals of Euclidean Geometry are *not* open to students majoring in mathematics.

BACHELOR OF SCIENCE

This curriculum is designed to include the basic theories, techniques, and applications of mathematics. It prepares students for graduate study in mathematics and for industrial employment. The required courses introduce the student to the principal areas of mathematics, and they provide a foundation for advanced study at the graduate level.

A student selecting this field of concentration must complete 39 credits in mathematics, including:

141 Introductory Calculus with Analytic Geometry	3
142 Intermediate Calculus with Analytic Geometry	3
215 Introduction to Algebraic Structures	3
243 Calculus and Analytic Geometry of Several Variables	3
316 Algebra	3
335 Advanced Calculus I	3
336 Advanced Calculus II	3
425 Topology	3
462 Functions of a Complex Variable	3

The student must complete a minor concentration of 18 or more credits in one of the following four areas:

Biological sciences (biology, botany, microbiology, zoology)
Physical sciences (astronomy, chemistry, geology, physics)
Social sciences (economics, geography, political science, psychology, sociology)
Computer science

Six credits in computer science may be counted toward the minor concentration in any of the first

three areas. The program must include PHY 213, 285, and 214, 286.

MTH 107 Introduction to Finite Mathematics, 108 Topics in Mathematics, 109 Algebra and Trigonometry, and 125 Fundamentals of Euclidean Geometry are *not* open to students majoring in mathematics.

Total credits required: 130

MEDICAL TECHNOLOGY

This curriculum, leading to the bachelor of science (B.S.)degree, prepares men and women for work in a hospital or other medical laboratory. 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 senior year is a 12-month course of study and is taken in a hospital school of medical technology. This clinical program includes didactic and laboratory instruction in the various areas of medical technology and prepares the student for the national examination given by the Board of Registry of the American Society of Clinical Pathologists.

Students are selected for the clinical program by the staffs of affiliated hospital schools of medical technology during the junior year. Although acceptance into a hospital school cannot be assured, every effort is made to place students in this final year of instruction. 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.

DIRECTOR: Associate Professor C. W. Houston.

FRESHMAN YEAR

First Semester

CHM 101, 102 General Chemistry or CHM 103, 105 General Chemistry	4
BOT 111 General Botany or ZOO 111 General Zoology	4
MTH 109 Algebra and Trigonometry or MTH 141 Introductory Calculus with Analytic Geometry	3
MTC 101 Medical Technology Seminary	1
General education requirement	3
	15

Second Semester

CHM 112, 114 General Chemistry	4
MTC 102 Medical Technology Seminary	1
ZOO 111 General Zoology or BOT 111 General Botany	4
General education requirements	6
Free elective	3
	18

SOPHOMORE YEAR

First Semester

CHM 227, 229 Organic Chemistry	4
PHY 111 General Physics	4
MTC 201 Medical Technology Seminar	1
General education requirements	6
	15

Second Semester

CHM 228, 230 Organic Chemistry	4
PHY 112 General Physics	4
MTC 202 Medical Technology Seminar	1
General education requirement	3
Free electives	6
	18

JUNIOR YEAR

First Semester

MIC 201 General Microbiology	4
CHM 212 Quantitative Analysis	4
General education requirements	6
Free elective	3
	17

Second Semester

MIC 432 Pathogenic Bacteriology	3
Biology elective	3
General education requirement	3
Free electives	6
	15

SENIOR YEAR

The hospital clinical program provides 32 credits.

Total credits required: 130

MILITARY SCIENCE

The Department of Military Science offers the Reserve Officers Training Corps (ROTC) program described on page 12.

FACULTY: Professor Carter, *chairman*. Assistant Professors Bonner, Galysh and Robinson.

MUSIC

The Department of Music offers a bachelor of arts (B.A.) degree and a bachelor of music (B.Mus.) degree.

FACULTY: Professor Giebler, *chairman*. Associate Professors Abusamra, Burns and Motycha; Assistant Professors Buck, Fuchs, Gibbs, Green, Kent and Rankin; Special Instructors Adams, Allan, Foley, Hunt, Goneconto, Greene, Marinaccio and Zeitlin.

BACHELOR OF ARTS

Students selecting music as a concentration will complete 30 credits as follows:

101 Introduction to Music	3
113, 114 Diatonic Harmony and Ear Training	6
215, 216 Advanced Harmony and Ear Training	6
221, 222 History of Music	6
251 Applied Music	6
317 Form and Analysis	3

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. No more than 6 elective credits will be allowed in any one area: theory and composition, history and literature, and applied music.

BACHELOR OF MUSIC

All students in this degree must take the following music courses:

101 Introduction to Music	3
113, 114 Diatonic Harmony and Ear Training	6
215, 216 Advanced Harmony and Ear Training	6
221, 222 History of Music	6
*250 Recital Laboratory	0
317 Form and Analysis	3
	24

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 degree in music until it is passed.

* MUS 250 must be taken each semester, except the second semester of the senior year.

In addition, each student selects one of the following areas of concentration.

PIANO OR ORGAN

261 Applied Piano or Organ	12
393 Chorus	4
399A Chamber Music Ensemble	4
418 Composition	3
420 Counterpoint	3
461 Applied Piano or Organ	16
481, 482 Piano Literature and Pedagogy or Music electives for organ major	4
Electives	10
	56

VOICE

261 Applied Voice	12
251 Applied Piano Minor	8
311 Choral Conducting	2
393 or 395 Chorus or Concert Choir	8
461 Applied Voice	16
Electives	10
	56

Students concentrating 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.

ORCHESTRAL INSTRUMENT

261 Applied Instrument	12
312 Instrumental Conducting	2
321 Orchestration	3
391, 392 or 394 Orchestra, Marching Band or Wind Ensemble	8
393 Chorus	4
418 Composition	3
420 Counterpoint	3
461 Applied Instrument	16
Electives	5
	56

MUSIC THEORY AND COMPOSITION

251 Applied Instrument or Voice	8
251B Applied Piano or 173, 175, 177, 179 and four elective credits for piano concentrates	8
321 Orchestration	3
391, 392, 393, 394 or 395 Orchestra, Marching Band, Chorus, Wind Ensemble or Concert Choir	4

393 Chorus	4
418 Composition	3
420 Counterpoint	3
427, 428 Sixteenth-Century Counterpoint	4
441 Special Project	3
451 Applied Instrument or Voice	8
Electives	8
	56

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

MUSIC HISTORY AND LITERATURE

251 Applied Instrument or Voice	8
304 Introduction to Contemporary Music	2
391, 392, 393, 394 or 395 Orchestra, Marching Band, Chorus, Wind Ensemble or Concert Choir	4
393 Chorus	4
407 The Symphony	3
408 The Opera	3
418 Composition	3
420 Counterpoint	3
431 The Baroque Era	3
432 The Classic Era	3
433 The Romantic Era	3
441 Special Project	0-6
451 Applied Instrument or Voice	8
Electives	9-3
	56

Students concentrating in music history and literature must have 15-credit hours of foreign languages with intermediate level proficiency in at least one language. The requirement may be modified or satisfied by advanced placement.

MUSIC EDUCATION

171, 172 Piano Class *pianists exempt*	2
173, 174 Voice Class *vocalists exempt*	2
*169, 175, 176, 177, 178, 179, 180 Instrumental Classes	6
251 Applied Instrument or Voice	8
311, 312 Conducting	4
321 Orchestration	3
391, 392 or 394 Orchestra, Marching Band or Wind Ensemble *for instrumentalists* or 393 or 395 Chorus or Concert Choir *for vocalists, pianists and organists*	8
393 Chorus *for instrumentalists* or Elective *for others*	4
339, 340 Methods and Materials in Teaching Music	6
451 Applied Instrument or Voice	8
EDC 484 Supervised Student Teaching	6
	57

* One course in the student's major instrument area is exempt.

Students concentrating in music education are required to take a minimum of 18 credit hours in education and music education for state certification. Courses in the Department of Education include: 102 Introduction to American Education, 312 Psychology of Learning and 484 Supervised Student Teaching.

EDC 102, 312 and all courses listed above under music education, with the exception of MUS 321 and senior-level courses in applied music, instrumental classes and major ensembles, must be completed before entering supervised student teaching. The practice teaching schedule must be preceded by a period of full-time observation at the assigned school and other schools. A follow-up seminar for all student teachers will be conducted each week of the practice teaching period.

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 Freeman, *chairman.* Professor Martin; Associate Professors Schwarz, and Young; Assistant Professors Fedoryka, Hanke, Kim, Peterson, Wenisch and Zeyl; Instructor Kowalski.

Students selecting this field of concentration must complete no less than 27 credit hours in philosophy. Three credits must include:

101 Logic: Principles of Reasoning or 251 Symbolic Logic	3

An additional 6 credits must be selected from:

321 History of Ancient Philosophy	3
322 History of Medieval Philosophy	3
323 History of Modern Philosophy	3
324 History of Recent Philosophy	3

The remaining minimum of 18 credit hours may be freely chosen from the departmental offerings. However, students planning graduate work in philosophy are advised to take 251 Symbolic Logic, 441 Metaphysics, 442 Epistemology, and at least two other courses numbered above 400.

PHYSICAL EDUCATION FOR MEN

The Department of Physical Education for Men offers the bachelor of science (B.S.) degree. The master of science (M.S.) program in physical education is described in the *Graduate School Bulletin.*

FACULTY: Associate Professor Zarchen, *chairman.* Associate Professor Nedwidek, *coordinator.* Professors Cieurzo and Slader; Associate Professors Calverly, Cole, Leathers, Maack, Piez and T. G. Russell; Assistant Professors Cooke, DelSanto, Falk, McCormick, J. S. Norris, O'Donnell, O'Leary, Polidoro, Sherman and Sonstroem; Lecturers Blackney, Condon, Drennan, English, Feula, Gregory, Henni, Kraft, Pascale and Posadowski.

This curriculum prepares men to teach in the field of health and physical education. It allows a broad exploration of subject area, but is flexible enough to provide degrees of specialization in (1) elementary physical education, (2) secondary physical education and athletic coaching, or (3) health education. Completion of the program fulfills the requirements for teacher certification in the state of Rhode Island.

Students may also fulfill state certification requirements for an academic subject ordinarily taught in secondary schools through proper selection of free electives.

Each student must purchase, at the beginning of the freshman year, the regulation uniform required of all freshmen; provide his own gymnasium shoes; rent a locker in the gymnasium and purchase, the second semester of the sophomore year, a special instructor's uniform.

FRESHMAN YEAR

First Semester

BIO 101 General Biology	3
SPE 101 Fundamentals of Oral Communication	3
PEM 121 Soccer and Physical Conditioning	1
PEM 123 Foundations of Health	3
PEM 125 Tumbling and Stunts	1
General education requirements	6
	17

Second Semester

BIO 102 General Biology	3
PHL 103 Introduction to Philosophy	3
PEM 122 Aquatics	1
PEM 124 History and Principles of Physical Education	2
PEM 126 Basic Gymnastics	1
General education requirements	6
	16

SOPHOMORE YEAR

First Semester

Chemistry or physics (any course where prerequisites have been met)	3-4
ZOO 121 Human Anatomy	4
PSY 113 General Psychology	3
PEM 241 Golf and Wrestling	1
PEM 243 Prevention and Care of Athletic Injuries and First Aid	3
Free elective	3
	17-18

Second Semester

EDC 102 Introduction to American Education	3
ZOO 242 Introductory Human Physiology	3
PSY 232 Developmental Psychology	3
PEM 242 Badminton and Tennis	1
Physical education specialized elective	2
General education requirements	4
	16

JUNIOR YEAR

First Semester

SPE 102 Public Speaking	3
ZOO 343 Physiology of Muscular Activity	3
PEM 369 Tests and Measurements in Physical Education	3
Physical education specialized elective	3
Free electives	4-5
	16-17

Second Semester

EDC 312 The Psychology of Learning	3
PEM 360 Rhythm and Dance	1
PEM 368 Methods and Materials in Physical Education or PEM 356 Methods and Materials in Health Education	2-3
PEM 370 Applied Anatomy and Kinesiology	3
Physical education specialized elective	3
Free elective	3
	15-16

SENIOR YEAR

First Semester

PEM 380 Curriculum and Administration of Physical Education	3

PEM 382 Community Recreation or PEM 383 Introduction to Outdoor Recreation	2-3
PEM 410 Adaptive and Corrective Physical Education	3
Physical education specialized elective	4
Free elective	4
	16-17

Second Semester

EDC 484 Supervised Student Teaching	12
EDC 485 Seminar in Teaching	3
	15

By the end of the sophomore year, the student may elect his specialization. After consulting with his faculty adviser and giving formal notification of intent to the department chairman, he may apply 12 credits of physical education to these specializations.

Students electing elementary physical education for emphasis must take PEM 244 Physical Education for the Elementary School, 354 Curriculum Designs in Elementary Physical Education, 365 Physical Education Observation and Assisting, 366 Physical Education Assisting. They must also complete a minimum of 4 credits from PEM 351 Understanding Motor Development of the Elementary School Child, 352 Movement Education in Elementary Physical Education, 374 Audio-visual Aids, 272 Advanced First Aid, 372 Instructors First Aid.

Students electing secondary physical education for emphasis must take PEM 363 Principles of Athletic Coaching, 365 Physical Education Observation and Assisting, 366 Physical Education Assisting. They must also complete a minimum of 6 credits from PEM 272 Advanced First Aid, 362 Coaching of Track and Field, 364 Coaching of Baseball, 372 Instructors First Aid, 374 Audio-visual Aids, 384 Coaching of Football, 386 Coaching of Basketball.

Students electing health education for emphasis must take PEM 357 Principles of Community Health, 359 Field Work in Health, 367 School Health Program. They must also complete a minimum of 3 credits from PEM 272 Advanced First Aid, 358 Current Problems of Safety and First Aid, 372 Instructors First Aid, 374 Audio-visual Aids.

Students who do not specialize in any of the above areas must complete a minimum of 12 credits of physical education electives.

Total credits required: 130

PHYSICAL EDUCATION FOR WOMEN

The Department of Physical Education for Women offers the bachelor of science (B.S.) degree. The master of science (M.S.) program in physical education is described in the *Graduate School Bulletin.*

FACULTY: Professor Massey, *chairman.* Associate Professors Crooker and Mandell; Assistant Professors Bloomquist, Bricker, Clegg, Cohen and Robinson; Instructor Seleen; Special Instructors I. Marsden and M. Marsden.

This curriculum is designed for women students who wish to teach physical education at the elementary or secondary school level. In addition to a concentration in the professional area, students are provided a liberal education background. Completion of the program fulfills the requirements for teacher certification by the state of Rhode Island.

Students must purchase a uniform for student teaching as prescribed by the department, prior to the second semester of the sophomore year.

FRESHMAN YEAR

First Semester

BIO 101 General Biology	3
MTH 107 Finite Mathematics	3
Physical education practicum	1
PEW 260 Foundations of Health	3
General education requirements or electives	6
	16

Second Semester

BIO 102 General Biology	3
Physical education practicum	1
PEW 172 First Aid	1
PEW 270 Introduction to the History and Philosophy of Physical Education	3
General education requirements or electives	9
	17

SOPHOMORE YEAR

First Semester

Chemistry elective or Physics elective	3-4
Physical education practicum	1
PEW 285 Principles of Teaching Physical Education	2
PEW 290 Recreation Programs and Leadership	2
PSY 113 General Psychology	3
ZOO 121 Human Anatomy	4

General education requirement or elective	3
	18-19

Second Semester

Chemistry elective or Physics elective	3-4
Physical education practicum	1
PEW 295 Physical Education in Elementary Schools	2
PEW 300 Theory of Teaching Team Sports	2
PSY 232 Developmental Psychology	3
ZOO 242 Introduction to Human Physiology	3
General education requirement or elective	3
	17-18

JUNIOR YEAR

First Semester

EDC 312 The Psychology of Learning	3
Physical education practicum	1
PEW 301 Theory of Teaching Team Sports	2
PEW 324 Rhythmic Analysis and Accompaniment	2
PEW 351 (or PEM 369) Tests and Measurements in Physical Education	3
ZOO 143 Physiology of Muscular Activity	3
General education requirement or elective	3
	17

Second Semester

Physical education practicum	1
PEW 320 Kinesiology	3
PEW 328 Theory and Teaching of Individual and Dual Sports	2
PEW 331 Theory and Teaching of Dance	2
General education requirements or electives	9
	17

SENIOR YEAR

First Semester

Physical education practicum	1
PEW 329 Theory and Teaching of Individual and Dual Sports	2
PEW 380 Organization and Administration of Physical Education	3
PEW 410 Corrective and Adapted Physical Education	3
General education requirements or electives	6
	15

Second Semester

EDC 484 Supervised Student Teaching	12

EDC 485 Seminar in Teaching	3
	15

Total credits required: 134

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 Dietz, *acting chairman*. Professor Quirk; Associate Professors Desjardins, Hartt, Lecher, Malik, Penhallow and Stone; Assistant Professors Choudry, Cuomo, Kaufman, Kirwan, Northby and Willis.

BACHELOR OF ARTS

Students selecting this field of concentration must complete a minimum of 30 credits in physics and mathematics, including:

111, 112 General Physics or 213, 214, 285, 286 Elementary Physics and Physics Laboratory	8
322 Mechanics	3
331 Theory of Electricity and Magnetism	3
381, 382 Advanced Laboratory Physics	6
401 or 402 Seminar in Physics	1
451 Atomic Physics	3
491, 492 Special Problems	3
MTH 244 Differential Equations	3

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.

BACHELOR OF SCIENCE

This curriculum provides a general background in theoretical and practical physics, and it qualifies the student for industrial research or advanced training in the industrial laboratories and in the technical bureaus of the government. Students also will have an adequate foundation for graduate work leading to higher degrees in physics.

The junior year is devoted largely to the classical problems and the theories of physics, and the more recent developments of the subject are treated in the senior year. Initiative, independent solution of laboratory problems, and research are encouraged in the advanced laboratory courses.

A well-prepared student, upon consultation with the department, may begin his study of physics in the first semester of the freshman year.

FRESHMAN YEAR

First Semester

MTH 141 Introductory Calculus with Analytic Geometry	3
General education requirements	12
	15

Second Semester

MTH 142 Intermediate Calculus with Analytic Geometry	3
PHY 213, 285 Elementary Physics	4
General education requirements	9
	16

SOPHOMORE YEAR

First Semester

MTH 243 Calculus and Analytic Geometry of Several Variables	3
PHY 214, 286 Elementary Physics	4
General education requirements	9
	16

Second Semester

MTH 244 Differential Equations	3
PHY 334 Optics	3
PHY 340 Introduction to Modern Physics	3
General education requirements	6
	15

JUNIOR YEAR

First Semester

Mathematics elective	3
PHY 331 Theory of Electricity and Magnetism	3
PHY 381 Advanced Laboratory Physics	3
General education requirement	3
Free electives	6
	18

Second Semester

Mathematics elective	3
PHY 322 Mechanics	3
PHY 382 Advanced Laboratory Physics	3
Free electives	9
	18

SENIOR YEAR

First Semester

PHY 483 Laboratory and Research Problems in Physics	3

PHY 451 Atomic and Nuclear Physics	3
PHY 421 Introduction to Theoretical Physics	3
Free electives	6
	15

Second Semester

PHY 484 Laboratory and Research Problems in Physics	3
PHY 402 Seminar in Physics	1
PHY 452 Nuclear Physics	3
PHY 431 Introduction to Theoretical Physics	3
Free electives	6
	16

Total credits required: 129

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 Warren, *chairman.* Professors S. B. Wood and Zucker; Associate Professors Leduc, Milburn and Stein; Assistant Professors Grossbard, Killilea and Tyler.

Students selecting this field of concentration must complete a minimum of 30 credits in political science, including:

113 American Politics	3
116 International Politics	3

The remaining 24 credits will reflect the emphasis desired by the student, though he must select at least one course in four of the following six fields:

American politics and public administration
Public law
Comparative government
International relations
Political theory
Political behavior

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 Berger, *chairman.* Professors Archer, Lal, A. Lott, Merenda and Vosburgh; Associate Professors Biller, Cain, Camp, Grebstein, B. Lott, Silverstein, Smith and Willoughby; Assistant Professors Berman, Berk, Gross, Makokian, O'Keefe, Prochaska and Swonger; Clinical Instructor Zubrinski; Adjunct Professors Ersivim, Josephson, Karkalas and Nicotra; Part-time Clinical Faculty and Consultants Antonelli, Farnum, Kataja, Mohrnheim, Musiker, Redmon, Richardson and Weiner.

Students in this field of concentration must complete a minimum of 30 credits to be distributed as follows:

113 General Psychology	3
232 Developmental Psychology	3
235 Theories of Personality	3
254 Behavior Problems and Personality Disorders	3
300 Quantitative Methods in Psychology	3
301 Introduction to Experimental Psychology	3

PSY 301 is required of all psychology majors and is a prerequisite for all courses in psychology numbered above 301, unless permission of the department is granted to be exempted from this requirement. Three courses must be selected from those numbered 310, 361, 381, 391, 434, 435, and one additional 3-credit course shall be selected.

SOCIOLOGY

The Department of Sociology and Anthropology offers the degree of bachelor of arts (B.A.) in sociology. The master of arts (M.A.) program in sociology is described in the *Graduate School Bulletin.*

FACULTY: Associate Professor Poggie, *chairman.* Professors England, Rosengren and Spaulding; Associate Professors Bouvier, Gardner and Gersuny; Assistant Professors Hodges, Sennott and Travisano; Instructors Bassis, Carroll, Gelles and Reilly.

Students selecting this field of concentration must complete a minimum of 30 credits in sociology, including:

202 General Sociology	3
204 Social Psychology	3
301 Theory and Methods of Sociological Research	3
492 History of Sociological Thought	3

SOC 202 and 204 should be taken during the sophomore year; 301 should be taken *no later* than the first semester of the junior year; and 492

is to be taken during the senior year whenever possible.

The remaining 18 credits are to be distributed in the two areas indicated below.

Area I, Social Institutions and Social Structure, 12 credits selected from:

206 Development of Human Societies
310 Rural Sociology
312 The Family
336 Social Stratification
408 Industrial Sociology
410 Complex Organizations
412 Occupations, Professions, and Social Structure
414 Demography
432 Ecology of the Community
434 Urban Sociology
436 Sociology of Politics
442 Sociology of Education
444 Sociology of Religion
502 Contemporary Sociological Theory
508 Individual and Social Organization
512 Concepts of Social Structure

Area II, Social Organization and Deviant Behavior, 6 credits selected from:

208 Issues and Problems in Contemporary American Society
314 Juvenile Delinquency
324 Medical Sociology
330 Criminology
338 Population Problems
340 Minority and Majority Relations
416 Seminar in Criminology
420 Sociology of the Environment
430 Social Pathology and Social Change
438 Aging and Society
440 Sociology of Mental Illness
510 Seminar in Deviance

Students planning careers in social work are advised to take courses listed under Social Welfare as electives. Social Welfare courses do not count toward the concentration in sociology. Students contemplating further work in anthropology are advised to take courses in anthropology as electives.

SPANISH

The Department of Languages offers the bachelor of arts (B.A.) degree with a concentration in Spanish. The master of arts (M.A.) program in Spanish is described in the *Graduate School Bulletin.*

FACULTY: Associate Professor Kossoff, *chairman* (Department of Languages); Professor Hutton, *section head.* Assistant Professors Freedman and Navascués; Instructor T. A. Bryan.

Students selecting Spanish as a concentration will normally complete 30 credits.

Language learning: SPA 103, 104, 205, 206 (depending on level begun), 0-12 credits.

Introduction to the use of Spanish in teaching or in literary studies: SPA 325, 326, 407, 408 (all four suggested for students in teacher education program, one course minimum required), 3-12 credits.

Literature: SPA 472 and 481, 6 credits.

The remaining hours to a minimum of 30 may be chosen from Spanish courses numbered between 430 and 574. LIN 409 and 410 and, with permission of the adviser, section head, department chairman, and dean of the college, courses in allied fields such as history, art and anthropology may also be selected.

A summer field workshop (SPA 410) in Spain or Hispanic-America is occasionally offered for 6 credits. For information, see the Spanish section head.

SPEECH

The Department of Speech offers the bachelor of arts (B.A.) degree with curriculums in general speech, speech education and speech science. The master of arts (M.A.) and master of science (M.S.) degree programs in speech pathology and audiology are described in the *Graduate School Bulletin.*

FACULTY: Professor Doody, *chairman.* Professors Beaupre and FitzSimons; Associate Professor Bailey; Assistant Professors Anderson, Brownell, Caldwell, Devlin, Grubman, Grzebien, Jirsa, Purdy and Schmeider; Instructors Katula and Roth; Clinical Assistant Professor Regan; Clinical Instructor Finck.

The department program provides maximum flexibility in planning for a wide variety of academic and occupational goals in the areas of general speech and in preprofessional preparation for graduate programs in speech pathology and audiology. The speech curriculum is personalized for each student. While the student plays a dominant role in curriculum planning, his program is closely supervised by his adviser. Specific curricular and extracurricular experiences are planned as integral parts of each student's program and approved courses relating to the speech communication core

may be taken outside the department and counted as concentration credits.

For students concentrating in general speech, it is recommended that 27 credits be the minimum in that area. They must include the following:

Rhetoric and public address	6-9
Oral interpretation of literature	3-6
Speech pathology and audiology	3-6

For students concentrating in speech education, the following program of speech courses is recommended:

101 Fundamentals of Oral Communication
102 Public Speaking
215 Argumentation and Debate
220 Group Discussion
231 Oral Interpretation of Literature
260 Speech Development and Correction
375 Language Development
or
410 Semantics
210 Elements of Persuasion
or
374 Communication Processes
Speech electives, 3 to 6 hours

In addition, the following education course requirements must be fulfilled:

EDC 102 or 103 Introduction to American Education
EDC 312 or 313 Psychology of Learning
EDC 372 Educational Measurements
EDC 430 Methods and Materials
EDC 484 Student Teaching
EDC 485 Seminar in Teaching

For students concentrating in the preprofessional program in speech pathology and audiology, the minimum is 30 credits. The following core of speech courses is recommended:

372 Auditory and Speech Mechanisms or equivalent, such as ZOO 142 Human Physiology or ZOO 121 Human Anatomy
260 Speech Development and Correction
261 Survey of Hearing and Deafness
373 Phonetics
375 Language Development

In addition, 6 hours of directed electives are chosen from the following:

SPE 374 Communication Processes
SPE 410 Semantics
CDF 200 Growth and Development of the Child
PSY 235 Theories of Personality
EDC 312 Psychology of Learning
EDC 371 Educational Measurements

The remaining 9 hours are electives unless the student anticipates public school certification as a speech pathologist or audiologist at the conclusion of graduate training. Students who anticipate certification must take EDC 102 Introduction to American Education, and either EDC 312 Psychology of Learning or CDF 200 Growth and Development of the Child, with 3 hours of electives.

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 either degree in theatre must be obtained through departmental interview or submission of a portfolio appropriate to the student's area of specialization.

FACULTY: Associate Professor Ranelli, *chairman*. Professor Will; Assistant Professors Hippely, Smoker, Spanabel, Steinberg and Wheelock; Instructor Swift.

BACHELOR OF ARTS

It is recommended that students selecting this concentration use courses in dramatic literature offered by the Department of English as partial fulfillment of Division A general education requirements. A minimum of 30 credits in theatre must be completed from the following:

REQUIRED COURSES

101 Introduction to Theatre Studies	3
110 Introduction to Acting	2
161 Stagecraft	3
201 Principles of Theatre	3

Students are expected to complete the credits from this category by the end of the sophomore year.

An additional 3 credits must be selected from the following:

ENG 255 Survey of English Drama
ENG 365 Modern Drama
ENG 433 Elizabethan Drama
ENG 446 Modern American Drama
ENG 465 Greek and Roman Drama
ENG 472 Shakespeare

ADVANCED COURSES

With the concurrence of his adviser, each student must select 9 credits from a combination of at least two of the following divisions:

Theatrical Performance (course numbers with the second digits 1, 2, or 3)

Theatre Business and Management (second digit 4)
Theatrical Design and Technology (second digits 5, 6, or 7)
Theatre History and Theory (second digits 8 or 9)

These courses must be at the 300-level or above with the exception of THE 161 and 215, which may be applied to the fulfillment of this requirement.

ELECTIVES

In order that each student may develop a program suitable to his own needs, he may freely elect in consultation with his adviser, courses in theatre necessary to complete the 30-credit requirement. With the approval of the Department of Theatre, the student may also substitute courses that are appropriately related to his own program, but which are offered by other departments of the University. Courses in dramatic literature, visual design, speech, voice, dance, and music are considered particularly advantageous for the theatre student.

The theatre student should consult his adviser before attempting to go beyond the normal 30-credit concentration.

BACHELOR OF FINE ARTS

To qualify for graduation with a B.F.A. degree in theatre, each student must be approved, subject to annual review, for departmental certification proficiency in one of the four divisions of the curriculum: theatrical performance, theatre business and management, theatrical design and technology, or theatre history and theory. A total of 124 credits is required for graduation, including 48 credits in the specialization.

REQUIRED COURSES

101 Introduction to Theatre Studies	3
110 Introduction to Acting	3
161 Stagecraft	3
201 Principles of Theatre	3

Students will be expected to complete the credits from this category by the end of the sophomore year.

An additional 3 credits must be selected from the following:

ENG 255 Survey of English Drama
ENG 365 Modern Drama
ENG 433 Elizabethan Drama
ENG 446 Modern American Drama
ENG 465 Greek and Roman Drama
ENG 472 Shakespeare

The remaining credits will be selected in consultation with the student's adviser.

SPECIALIZATION

Courses for specialization should be selected primarily from *one of the divisions of the theatre curriculum* in which the student plans to obtain certification of proficiency. However, with the concurrence of the student's adviser, these courses may be supplemented by other theatre courses or by selection of appropriate courses offered by other departments of the University. Particularly advantageous to the theatre student are courses in dramatic literature, visual design, speech, voice, dance and music.

COURSES OUTSIDE THE SPECIALIZATION

With the concurrence of his adviser, each student must select 12 credits from a combination of at least two of the divisions of the theatre curriculum other than the division in which the student plans to obtain certification of proficiency. These include:

Theatrical performance (course numbers with the second digits 1, 2, or 3)
Theatre business and management (second digit 4)
Theatrical design and technology (second digits 5, 6, or 7)
Theatre history and theory (second digits 8 or 9)

These courses must be at the 300-level or above with the exception of THE 161 and 215 which may also fulfill this requirement.

URBAN AFFAIRS

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

The Urban Affairs Program is described on page 10 and members of the coordinating committee are listed on page 242.

Students who select one of these three concentrations must complete five courses chosen from the core for the concentration, three or four courses chosen from the remaining courses, and one or two semesters in the Senior Seminar in Urban Affairs. Each of the concentrations requires a minimum of 30 credits.

Students who wish to major in one of these concentrations should consult the appropriate mem-

ber of the Urban Affairs Program Coordinating Committee for assistance in the formulation and approval of their concentrations.

URBAN AFFAIRS: PERSONALITY AND CULTURE

This concentration is designed to describe the interaction among man, society and the urban environment; to examine ways in which this interaction is restricted or facilitated, and to experiment with social designs to improve this interaction.

CORE COURSES

APG 319 Cultural Behavior and the Environment
CDF 480 Children and Families in Poverty
ECN 401 Poverty in the United States
EDC 590 Social Issues in Urban Education
GEG 121 Cultural Geography
PSY 435 The Psychology of Social Behavior
SWF 311 Introduction to Social Work
SOC 430 Social Pathology and Social Change
SOC 434 Urban Sociology
SPE 315 Environmental Dimensions of Communication

REMAINING COURSES

APG 203 Cultural Anthropology
APG 321 Social Anthropology
ART 361, 362 Modern Art
CDF 150 Personal Development
CDF 200 Growth and Development of Children
CDF 340 Family and Community Health
CDF 403 Human Development During Adulthood
EDC 102 Introduction to American Education
EDC 407 Philosophy of Education
EDC 409 Health Aspects of Aging
EDC 451 Human Resource Development
PCL 321 The Chemical Environment of Man
POR 495 The Civilization of Portugal
PSY 113 General Psychology
PSY 301 Introduction to Experimental Psychology
PSY 300 Quantitative Methods in Psychology I
PSY 460 The Psychology of Violence
SWF 313 Social Welfare Services
SOC 202 General Sociology
SOC 204 Social Psychology
SOC 314 Juvenile Delinquency
SOC 330 Criminology
SOC 336 Social Stratification
SOC 340 Minority and Majority Relations
SOC 410 Complex Organizations in Modern Society
SOC 438 Aging and Society

URBAN AFFAIRS: POLICY FORMATION

This concentration is designed to identify the decision-making processes within the metropolis; to examine the ways in which public policies are formulated and implemented, and to experiment with ideas about the substance as well as the outcomes of the policy formation processes.

CORE COURSES

CPL 503 Urban Planning and Politics in the Metropolis
ECN 342 Public Finance
ECN 402 Urban Economics
GEG 100 Geography of Human Ecosystems
GEG 411 Urban Geography
HIS 542 Urban History
PSC 460 Urban Politics
PSC 466 Urban Problems
SOC 208 Issues and Problems in Contemporary American Society
SOC 342 Ecology of the Community

REMAINING COURSES

CPL 410 Fundamentals of Urban Planning
ECN 123 Elements of Economics
ECN 126 Economic Principles
ECN 401 Poverty in the United States
ECN 464 Comparative Economic Systems
FIN 332 Financial Institutions
FIN 341 Fundamentals of Real Estate
GEG 131 Political Geography
GEG 412 Seminar in Urban Geography
HIS 142 History of the United States since 1865
HIS 441 United States History since 1945
HIS 443 Social and Intellectual History of the United States, 1865 to Present
HIS 445 History of the Negro Peoples
HIS 448 American Social Reform
HIS 591a Colloquium on Urban History
INS 333 Social Insurance
OMR 422 Labor Legislation
OMR 423 Industrial Relations
OMR 321 Labor Problems
PSC 113 American Politics
PSC 422 State and Local Government
PSC 463 Civil Liberties
PSC 495 Comparative Urban Politics
PSC 498 Public Administration and Policy Formulation
REN 210 Man and Resource Use
REN 450 Resource Policy and the Environment
SOC 202 General Sociology
SOC 336 Social Stratification
SOC 340 Minority and Majority Relations
SOC 434 Urban Sociology
SOC 436 Sociology of Politics

URBAN AFFAIRS: SPATIAL DEVELOPMENT

This concentration is designed to identify the physical resources and spatial needs of the urban community; to examine ways in which these re-

sources are adapted to satisfying public and private needs, and to experiment with planning methods that will improve the coordination between resources and needs.

CORE COURSES

CHM 107 Chemistry of Our Environment
CPL 410 Fundamentals of Urban Planning
CPL 503 Urban Planning and Politics in the Metropolis
ECN 302 Economic Development of the United States
ECN 402 Urban Economics
EGR 304 Technology and Society
GEG 100 Geography of Human Ecosystems
GEG 410 Urban Geography
PSC 491 Principles of Public Administration
REN 350 Contemporary Resource Use Conflict
SOC 423 Sociology of the Environment
ZOO 262 Introductory Ecology

REMAINING COURSES

ART 260 A Short History of Architecture
CPL 411 Introduction to Community Planning
ESC 101 Principles of Earth Science
CVE 346 Transportation Engineering
CVE 374 Environmental Engineering I
ECN 123 Elements of Economics
ECN 333 Transportation Principles
FIN 341 Fundamentals of Real Estate
GEG 412 Seminar in Urban Geography
MCE 336 Introduction to Air Pollution Control
MCE 354 Fluid Mechanics
PLS 104 Plants, Man and the Environment
PLS 242 Appreciation of Landscape Design
PSC 113 American Politics
PSC 460 Urban Politics
PSC 466 Urban Problems
RDV 100 Natural Resource Conservation
REN 210 Man and Resource Use
REN 220 Resource Conservation in the Modern Economy
SOC 202 General Sociology
SOC 206 Development of Human Societies

College of Business Administration

RICHARD R. WEEKS, *Dean*
EUGENE M. JOHNSON, *Assistant Dean*
EVERETT T. HARRIS, *Assistant to the Dean*

The eleven curriculums in the College of Business Administration allow the student to develop competence in a special field of interest and prepare him to meet the changing complexities of life and leadership in the business community. Curriculums are offered in accounting with possible emphasis on governmental, private, and public accounting; business education; business education with an option in distributive education; finance; general business administration; insurance; management science; marketing; marketing with an option in advertising; office administration, organizational management and industrial relations; operations management; real estate; and urban business.

Basic courses required of all undergraduates at the University introduce the student to the humanities, social sciences, physical and biological sciences, and the arts, which are becoming more and more important for success in the business world. 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, economics, finance, law, management science, marketing, organizational management and industrial relations, production and operations management, and statistics. The College is strengthening its emphasis on 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. In all areas of learning, theory as well as analysis and decision-making is stressed.

Ordinarily students must take required business courses at the University of Rhode Island. Those who expect to obtain a degree from this University must obtain prior approval to take work at other institutions.

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. Junior college transfer credits may be applied only to lower division courses.

A student enrolled in the College of Business Administration must complete the curriculum in one of the major areas of concentration and must obtain an average of 2.00 points or better in all required courses in his major area of concentration. Each student selects his major area of study by the second semester of his sophomore year.

All 500- and 600-level courses offered by departments in the College of Business Administration are open to matriculated graduate students only.

CURRICULUM REQUIREMENTS

GENERAL EDUCATION REQUIREMENTS

Students are required to select and pass 45

credits of course work from the general education requirements as listed on page 9. Specific requirements of the College of Business Administration in each division are listed below:

DIVISION A

Any course for which prerequisites have been met.

DIVISION B

MGS 101, 102 in the freshman year; MGS 201, 202 in the sophomore year.

DIVISION C

ECN 125, 126 in the sophomore year.

DIVISION D

SPE 101 in the freshman year; BED 227 in the sophomore year.

ELECTIVES

Professional electives are courses offered by departments in the College of Business Administration not required in the student's major.

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

Free electives may be either professional or liberal electives.

FRESHMAN YEAR

Common to all curriculums except Business Education and Office Administration.

First Semester

MGS 101 Introduction to Quantitative Analysis for Business and Economics	3
MGS 107 Introduction to Computing in Management	3
General education electives	9
	15

Second Semester

MGS 102 Introduction to Quantitative Analysis for Business and Economics	3
General education electives	9
SPE 101 Fundamentals of Oral Communication	3
	15

SOPHOMORE YEAR

First Semester

ACC 201 Elementary Accounting	3
BED 227 Business Communications	3
MGS 201 Business Statistics	3
ECN 125 Economic Principles	3
Liberal elective	3
	15

Second Semester

ACC 202 Elementary Accounting	3
MGS 202 Business Statistics	3
ECN 126 Economic Principles	3
General education elective	3
Liberal elective	3
	15

ACCOUNTING

The Department of Accounting offers a 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, and the master of business administration (M.B.A.) degree with an opportunity for specialization in accounting are described in the *Graduate School Bulletin.*

FACULTY: Assistant Professor Martin, *acting chairman.* Professors G. W. Lees and Sanderson; Associate Professors D. E. Lees, Vangermeersch and P. S. Wood; Assistant Professors Brandon, duBois, Looney, and Matoney; Special Instructor Fradin.

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 general accountants, 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 choice, whether this training is to be used as an aid to living or as a basis for graduate study.

Ingersoll-Rand in 1973 established a summer internship in internal auditing. Two students will be selected from the junior class. Selections are based on academic record and interest in internal auditing.

JUNIOR YEAR

First Semester

ACC 311 Intermediate Accounting	3
ACC 321 Cost Accounting	3
ECN 327 or 328 Intermediate Economics	3
FIN 321 Fundamentals of Financial Management	3
OMR 301 Principles of Management	3
	15

Second Semester

ACC 312 Intermediate Accounting	3
ACC 422 Advanced Cost Accounting	3
MMG 323 Marketing Principles	3
MGS 309 Operations Management	3
MGS 364 Quantitative Analysis of Management Operations	3
	15

SENIOR YEAR

First Semester

ACC 431 Advanced Accounting	3
ACC 443 Federal Tax Accounting	3
BSL 333 Law in a Business Environment	3
Free electives	6
	15

Second Semester

ACC 461 Auditing	3
BSL 334 Law in a Business Environment or BSL 342 Property Interests	3
GBA 410 Business Policy	3
Professional elective	3
Free elective	3
	15

Total credits required: 120

BUSINESS EDUCATION

The Department of Business Education and Office Administration offers the bachelor of science (B.S.) degree in business education. The master of science (M.S.) degree in business education is described in the *Graduate School Bulletin.*

FACULTY: Assistant Professor Langford, *chairman.* Associate Professor K. F. Smith; Assistant Professors Clark and Sink.

This curriculum, which fulfills the requirement of the Rhode Island State Board of Education for certification, offers students an opportunity to prepare themselves to become teachers of business subjects. Two concentrations are available in the curriculum: social business-secretarial and distributive education.

A student electing the distributive education concentration will also be certified to teach social business subjects. Students selecting the social business-secretarial concentration will be eligible for certification in both of these areas.

In addition to business and education courses, the programs also provide a broad liberal background. The curriculum for the freshman and sophomore years is common to both concentrations.

FRESHMAN YEAR

First Semester

*BED 121 Elementary Typewriting	2
MGS 101 Introduction to Quantitative Analysis for Business and Economics	3
SPE 101 Fundamentals of Oral Communication	3
General education electives in Division A	6
	14

Second Semester

BED 122 Advanced Typewriting	2
MGS 102 Introduction to Quantitative Analysis for Business and Economics	3
MGS 107 Introduction to Computing in Management	3
General education elective in Division A	3
General education elective	3
Free elective	3
	17

SOPHOMORE YEAR

First Semester

ACC 201 Elementary Accounting	3
MGS 201 Business Statistics	3
ECN 125 Economic Principles	3
EDC 102 Introduction to American Education	3
PSY 113 General Psychology	3
	15

Second Semester

ACC 202 Elementary Accounting	3
MGS 202 Business Statistics	3
ECN 126 Economic Principles	3
EDC 312 The Psychology of Learning	3
BED 227 Business Communications	3
	15

SOCIAL BUSINESS-SECRETARIAL CONCENTRATION

JUNIOR YEAR

First Semester

ACC 301 Accounting for Business Teachers	3
*BED 321 Elementary Shorthand	4
BED 326 Business Machines	3
BSL 333 Law in a Business Environment	3
MMG 323 Marketing Principles	3
	16

Second Semester

BED 322 Advanced Shorthand	4
BSL 334 Law in a Business Environment	3
EDC 430 Methods and Materials in Secondary Teaching	3
FIN 321 Fundamentals of Financial Management	3
OMR 301 Principles of Management	3
Free elective	3
	19

SENIOR YEAR

First Semester

BED 323 Dictation and Transcription	4
EDC 441 Methods and Materials of Teaching Business Subjects	4
GBA 410 Business Policy	3
MGS 309 Operations Management	3
MGS 383 Data Processing Systems	3
	17

Second Semester

EDC 484 Supervised Student Teaching	12
EDC 485 Seminar in Teaching	3
	15

Total credits required: 128

DISTRIBUTIVE EDUCATION CONCENTRATION

JUNIOR YEAR

First Semester

ACC 301 Accounting for Business Teachers	3
BED 326 Business Machines	3
BSL 333 Law in a Business Environment	3
MMG 323 Marketing Principles	3
OMR 301 Principles of Management	3
	15

Second Semester

BSL 334 Law in a Business Environment	3
EDC 430 Methods and Materials in Secondary Teaching	3
FIN 321 Fundamentals of Financial Management	3
MMG 335 Fundamentals of Advertising	3
MGS 309 Operations Management	3
Free elective	3
	18

SENIOR YEAR

First Semester

BED 427 Organization, Administration and Methods of Teaching Distributive Education	3
BED 428 Coordinating and Developing Curriculum for Distributive Education	3
GBA 410 Business Policy	3
MGS 383 Data Processing Systems	3
MMG 443 Retail Store Management	3
Free elective	3
	18

Second Semester

EDC 484 Supervised Student Teaching	12
EDC 485 Seminar in Teaching	3
	15

Total credits required: 127

* Students may be excused from taking BED 121 and 321 by passing a satisfactory examination, but must substitute an equal number of credits in their program.

FINANCE

The Department of Finance and Insurance offers the bachelor of science (B.S.) degree in finance. The master of business administration (M.B.A.) degree with an opportunity for specialization in finance is described in the *Graduate School Bulletin*.

FACULTY: Professor Poulsen, *chairman*. Professors Brainard and Pitterman; Assistant Professors Booth, Fitzgerald, Hershbarger, and Speicher.

Courses in finance are designed to provide students with an understanding of financial institutions, investments, and mercantile and trade credit. This field of specialization prepares students for executive careers in (1) commercial banks and related financial institutions; (2) investment banking and investment management; (3) financial management, including careers as treasurers, controllers, credit managers, budget executives and administrators in business enterprises; and (4) administrative work in governmental financial institutions.

JUNIOR YEAR

First Semester

BSL 333 Law in a Business Environment	3
FIN 321 Fundamentals of Financial Management	3
FIN 332 Financial Institutions	3
OMR 301 Principles of Management	3
Liberal elective	3
	15

Second Semester

FIN 330 Problems in Financial Management	3
MMG 323 Marketing Principles	3
MGS 309 Operations Management	3
MGS 383 Data Processing Systems	3
Professional elective	3
	15

SENIOR YEAR

First Semester

FIN 422 Investments	3
FIN 410 Capital Markets	3
Professional electives	6
Free elective	3
	15

Second Semester

FIN 440 Problems in Security Investments	3
GBA 410 Business Policy	3
Professional elective	3
Liberal elective	3
Free elective	3
	15

Total credits required: 120

GENERAL BUSINESS ADMINISTRATION

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 or concentration. 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

BSL 333 Law in a Business Environment	3
FIN 321 Fundamentals of Financial Management	3
OMR 301 Principles of Management	3
MMG 323 Marketing Principles	3
MGS 383 Data Processing Systems	3
	15

Second Semester

BSL 334 Law in a Business Environment or BSL 342 Property Interests	3
FIN 330 Problems in Financial Management	3
OMR 302 Group Dynamics in Industry	3
MMG 462 Marketing Research	3
MGS 309 Operations Management	3
	15

SENIOR YEAR

First Semester

Professional electives	6
Free electives	9
	15

Second Semester

GBA 410 Business Policy	3
Professional electives	6
Free electives	6
	15

Total credits required: 120

INSURANCE

The Department of Finance and Insurance offers the bachelor of science (B.S.) degree in insurance. The master of business administration (M.B.A.) degree with an opportunity for specialization in insurance is described 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.).

For success in this industry, the professional concept with its emphasis on expert knowledge has become increasingly important, and students in this curriculum are prepared for and encouraged to work toward the professional designations conferred by the American College of Life Underwriters (C.L.U.) and the American Institute of Property and Liability Underwriters (C.P.C.U.).

The curriculum offers comprehensive preparation for diversified career opportunities in insurance, including satisfaction of state requirements for agents' and brokers' licenses in fire and marine, casualty and surety, and life and accident-sickness fields. It is approved by state insurance departments in Rhode Island and New York.

JUNIOR YEAR

First Semester

BSL 333 Law in a Business Environment	3
INS 301 Fundamentals of Risk Management and Insurance	3
OMR 301 Principles of Management	3
FIN 321 Fundamentals of Financial Management	3
Professional elective	3
	15

Second Semester

INS 313 Property Insurance	3
MMG 323 Marketing Principles	3
MGS 309 Operations Management	3
Professional elective	3
Free elective	3
	15

SENIOR YEAR

First Semester

INS 314 Liability Insurance	3
INS 333 Social Insurance	3
Liberal elective	3
Free electives	6
	15

Second Semester

GBA 410 Business Policy	3
INS 325 Life Insurance	3
INS 322 Automobile Insurance	3
Professional electives	6
	15

Total credits required: 120

MANAGEMENT SCIENCE

The Department of Management Science offers 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 Vollmann, *chairman.* Associate Professors Jarrett, Shen and Sternbach; Assistant Professors Ageloff, Armstrong, Budnick, Mojena, Parsons and Zartler; Lecturer Schuldenfrei.

Management Science (M.G.S.) 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 M.G.S. concentration relates to the interface between quantitative techniques and their application in the real world. Upon graduating, majors in MGS 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 masters or a doctorate.

JUNIOR YEAR

First Semester

MGS 301 Advanced Quantitative Foundations	3
FIN 321 Fundamentals of Financial Management	3
MMG 323 Marketing Principles	3
BSL 333 Law in a Business Environment	3
Free elective	3
	15

Second Semester

MGS 309 Operations Management	3
MGS 365 Management Science I	3
OMR 301 Principles of Management	3
MGS 370 Topics in Managerial Statistics	3
Professional elective	3
	15

SENIOR YEAR

First Semester

MGS elective	3

MGS 366 Management Science II	3
Professional electives	6
Free elective	3
	15

Second Semester

MGS elective	3
GBA 410 Business Policy	3
Professional elective	3
Free electives	6
	15

MARKETING MANAGEMENT

The Department of Marketing Management offers the bachelor of science (B.S.) degree with options in either advertising or marketing. In each option the student obtains a balanced preparation for the various opportunities in marketing and advertising. The master of business administration (M.B.A.) degree with an opportunity for specialization in marketing management is described in the *Graduate School Bulletin.*

FACULTY: Professor Alton, *chairman.* Professor Weeks; Associate Professors Bowman, C. R. Hill, E. M. Johnson and Wiener; Assistant Professors Della Bitta and Loudon.

One of our major economic problems is to market the productivity of our factories. Despite an ever-increasing ability to buy, consumers must be willing to buy. A marketing manager's responsibility, therefore, is to determine the needs and desires of consumers, of industry, and of the entire economy. Marketing research provides the necessary information to develop products as well as insights into communications and distribution channels best suited to reach consumers. Marketing, therefore embraces such functions as marketing research, product planning and pricing, advertising creation and management, sales administration, merchandising, transportation, promotion and public relations.

JUNIOR YEAR

First Semester

FIN 321 Fundamentals of Financial Management	3
OMR 301 Principles of Management	3
MMG 323 Marketing Principles	3
MMG 334 Consumer Behavior	3
Professional elective	3
	15

Second Semester

FIN 330 Problems in Financial Management	3
MMG 335 Fundamentals of Advertising	3
MMG 462 Marketing Research	3
MGS 309 Operations Management	3
Free elective	3
	15

MARKETING OPTION

SENIOR YEAR

First Semester

BSL 333 Law in a Business Environment	3
MMG 332 Sales Management	3
MMG 443 Retail Store Management	3
Professional elective	3
Free elective	3
	15

Second Semester

GBA 410 Business Policy	3
MMG 464 Marketing Policy and Problems	3
MMG 452 International Marketing	3
Free electives	6
	15

ADVERTISING OPTION

SENIOR YEAR

First Semester

BSL 333 Law in a Business Environment	3
MMG 332 Sales Management	3
MMG 474 Advertising Seminar	3
Professional elective	3
Free elective	3
	15

Second Semester

GBA 410 Business Policy	3
MMG 464 Marketing Policy and Problems	3
MMG 475 Advertising Campaigns	3
Free electives	6
	15

Total credits required: 120

OFFICE ADMINISTRATION

The Department of Business Education and Office Administration offers the bachelor of science (B.S.) degree in office administration.

This curriculum prepares students to assume

responsible positions in business, industry, government service, and the professions as executive secretaries or administrative assistants.

A broad background in general business administration subjects, together with office skills and liberal electives for cultural enrichment, provide the student with the qualifications necessary for success in this challenging career.

FRESHMAN YEAR

First Semester

*BED 121 Elementary Typewriting	2
MGS 101 Introduction to Quantitative Analysis for Business and Economics	3
MGS 107 Introduction to Computing in Management	3
General education elective in Division A	3
SPE 101 Fundamentals of Oral Communication	3
	14

Second Semester

BED 122 Advanced Typewriting	2
MGS 102 Introduction to Quantitative Analysis for Business and Economics	3
General education elective	3
General education elective in Division A	3
Free elective	3
	14

SOPHOMORE YEAR

First Semester

ACC 201 Elementary Accounting	3
BED 227 Business Communications	3
MGS 201 Business Statistics	3
ECN 125 Economic Principles	3
General education elective in Division C	3
	15

Second Semester

ACC 202 Elementary Accounting	3
MGS 202 Business Statistics	3
ECN 126 Economic Principles	3
PSY 113 General Psychology	3
General education elective in Division A	3
	15

* Students may be excused from taking BED 121 and 321 by passing a satisfactory examination, but must substitute an equal number of credits in their program.

JUNIOR YEAR

First Semester

*BED 321 Elementary Shorthand	4
BED 326 Business Machines	3
BSL 333 Law in a Business Environment	3
MGS 383 Data Processing Systems	3
OMR 301 Principles of Management	3
	16

Second Semester

BED 322 Advanced Shorthand	4
BSL 334 Law in a Business Environment	3
FIN 321 Fundamentals of Financial Management	3
MMG 323 Marketing Principles	3
Free elective	3
	16

SENIOR YEAR

First Semester

BED 323 Dictation and Transcription	4
BED 325 Records Administration	3
General education elective	3
Free electives	6
	16

Second Semester

BED 324 Advanced Dictation and Transcription	2
BED 328 Office Procedures and Administration	3
GBA 410 Business Policy	3
MGS 309 Operations Management	3
OMR 300 Personnel Administration	3
	14

Total credits required: 120

ORGANIZATIONAL MANAGEMENT, INDUSTRIAL RELATIONS

The Department of Organizational Management and Industrial Relations offers the bachelor of science (B.S.) degree. The master of business administration (M.B.A.) degree with an opportunity for specialization in organizational management and industrial relations is described in the *Graduate School Bulletin.*

FACULTY: Professor Coates, *chairman.* Professors Geffner and Kaiser; Associate Professors deLodzia, Hoban, Peck and Schmidt; Assistant Professors Desfosses, Overton and Raffaele.

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 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, hospital, 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

OMR 301 Principles of Management	3
FIN 321 Fundamentals of Financial Management	3
MGS 383 Data Processing Systems	3
Free electives	6
	15

Second Semester

MMG 323 Marketing Principles	3
MGS 309 Operations Management	3
OMR 302 Group Dynamics in Industry	3
Free electives	6
	15

SENIOR YEAR

First Semester

BSL 333 Law in a Business Environment	3
OMR 303 Personnel Administration and Organizational Behavior	3
OMR 431 Advanced Management Seminar	3
Professional elective	3
Liberal elective	3
	15

Second Semester

GBA 410 Business Policy	3
OMR 423 Industrial Relations	3
Professional electives	6
Free elective	3
	15

Total credits required: 120

OPERATIONS MANAGEMENT

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

Specific topics discussed include assignment of facilities; product research and development; control of quality and quantity; design of operations and processes; aggregate planning of employment, inventory and production; budget and cost analysis; capital costs and investment criteria; information and material flows; evaluation of system performance.

JUNIOR YEAR

First Semester

*MGS 364 Quantitative Analysis of Managerial Operations or MGS 301 Advanced Quantitative Foundations	3
FIN 321 Fundamentals of Financial Management	3
MMG 323 Marketing Principles	3
BSL 333 Law in a Business Environment	3
MGS 309 Operations Management	3
	15

Second Semester

OMR 301 Principles of Management	3
MGS 310 Materials Management	3
MGS elective or MGS 365 Management Science I	3
Professional elective	3
Free elective	3
	15

SENIOR YEAR

First Semester

MGS 445 Managerial Applications of Simulation	3

* Students must take either MGS 364 in the junior year or the sequence MGS 301, 365 and 366 in the junior and senior years.

OMR 303 Personnel Administration and Organizational Behavior	3
Professional elective or MGS 366 Management Science II	3
Professional elective	3
Free elective	3
	15

Second Semester

MGS 458 Advanced Production Management	3
GBA 410 Business Policy	3
OMR elective	3
MGS elective	3
Free elective	3
	15

Total credits required: 120

URBAN AFFAIRS

The curriculum in Urban Business is part of the newly created, interdisciplinary Urban Affairs Program (see page 10). It is designed to provide business students with a general understanding of the role of business enterprise in dealing with urban problems and prospects. The curriculum includes a summer internship at the end of the junior year and a Senior Seminar which brings together students in urban affairs concentrations from all parts of the University.

Students who wish to major in this curriculum should consult the appropriate member of the Urban Affairs Program Coordinating Committee (listed on page 242) for assistance in the formulation and approval of their curriculums.

JUNIOR YEAR

First Semester

BSL 333 Law in a Business Environment	3
FIN 321 Fundamentals of Financial Management	3
OMR 301 Principles of Management	3
MMG 323 Marketing Principles	3
Professional elective	3
	15

Second Semester

MGS 309 Operations Management	3
PSC 466 Urban Problems	3
ECN 401 Poverty in the United States	3
SOC 434 Urban Sociology	3
PSC 460 Urban Politics	3
	15

SENIOR YEAR

First Semester

ECN 402 Urban Economics	3
Senior Seminar	3
Professional electives	9
	15

Second Semester

GBA 410 Business Policy	3
Professional electives	6
Free electives	6
	15

Total credits required: 120

College of Engineering

LEWIS D. CONTA, *Dean*
ERNEST B. GOODWIN, *Assistant Dean*

The College of Engineering offers undergraduate curriculums in chemical, civil, electrical, industrial, mechanical engineering, engineering science, chemical and ocean engineering, and mechanical and ocean engineering. Because the same fundamental concepts underlie all branches of engineering, the freshman year courses are essentially the same for all curriculums, and the choice of a specific branch of engineering is generally delayed until the beginning of either the second term, or the second year of study. Students choosing one of the curriculums that include ocean engineering follow the curriculums for chemical or mechanical engineering for three years and choose the ocean engineering segment in the 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 specific study in depth 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 accommodate to the rapid changes taking place in all branches of engineering.

Engineering students, in common with all other students in the University, must meet the 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.

Students who have decided to major in engineering should select courses in general chemistry, natural sciences, general education electives, MTH 141 Introductory Calculus with Analytic Geometry, MTH 142 Intermediate Calculus with Analytic Geometry, EGR 101 Introduction to Engineering, EGR 102 Basic Graphics, and either MCE 161 Mechanics I, MCE 162 Statics or PHY 213 and 285 Elementary Physics and Laboratory. Specific requirements are listed for the freshman year in each of the curriculums that follow.

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 161 or 162 or PHY 213 and 285, and two courses in the natural sciences, one of which should be chemistry, are required for graduation from the College of Engineering, and are prerequisites for many engineering courses. They normally must be taken at an early stage, preferably before transferring from University College to the College of Engineering. Students who have not taken them before entering the College of Engineering must confer with an

engineering adviser to work out a program for completing all degree requirements. In such cases completion of graduation requirements may take longer than the normal time.

CHEMICAL ENGINEERING

The Department of Chemical Engineering offers a curriculum leading to the bachelor of science (B.S.) degree in chemical engineering and in cooperation with the Department of Ocean Engineering offers a curriculum leading to the bachelor of science (B.S.) degree in chemical and ocean engineering. 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*. A bachelor of science (B.S.) degree in chemical engineering plus a master's degree in business administration (M.B.A.) is offered through a five-year professional option program.

FACULTY: Professor Treybal, *chairman*. Professors Gielisse, Madsen, Mairs, Mohrnheim, Shilling and Thompson; Associate Professors Rockett, Rose and F. Votta; Assistant Professors Barnett and Knickle; Adjunct Associate Professor DiMeglio; Adjunct Assistant Professors Doyle, Sahagian, Soltz and Spano.

The chemical engineer is concerned with the promotion and control of chemical and physical changes, wherever they occur. Control means that the desired goal be achieved at a reasonable cost. Chemical change occurs in many places—inside a rocket motor and inside a human organ. The chemical engineer may be working on the removal of toxic components from the blood by an artificial kidney or examining and modelling the flow of exhaust gases from automobiles on the freeway (turbulent diffusion and heat transfer coupled with chemical change). His domain includes the more efficient use of our energy resources and the processing of sewage effluent and its effect on the upper ten feet of the earth's surface.

Chemical engineers have a strong foundation in chemistry, physics, mathematics and basic engineering. Chemical engineering courses include the use of analog and 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 work in a variety of areas including biomedical, biochemical, combustion, ocean, petroleum, chemical, pharmaceutical, metals, space, nuclear energy, textile, ceramics, paper, foods, paint, rubber, plastics, and environmental problems.

The senior year curriculum for students concentrating in chemical and ocean engineering, is listed under Ocean Engineering, page 82.

FRESHMAN YEAR

First Semester

*CHM 191 General Chemistry	5
EGR 101 Introduction to Engineering	1
EGR 102 Basic Graphics	1
MTH 141 Introductory Calculus with Analytic Geometry	3
General education electives in Division A, C or D	6
	16

Second Semester

*CHM 192 General Chemistry	5
MTH 142 Intermediate Calculus with Analytic Geometry	3
†PHY 213, 285 Elementary Physics and Physics Laboratory	4
ECN 123 Elements of Economics	3
General education elective in Division A, C or D	3
	18

SOPHOMORE YEAR

First Semester

CHE 211 Introduction to Chemical Engineering	2
CHE 212 Chemical Process Calculation	2
CHM 431 Physical Chemistry	3
MTH 243 Calculus and Analytic Geometry of Several Variables	3
†PHY 214, 286 Elementary Physics and Physics Laboratory	4
General education elective in Division A, C or D	3
	17

Second Semester

BIO 102 General Biology	3

* For CHM 191 and 192 (10 credits), students may substitute CHM 101, 102, 112, 114 and 212 (12 credits).

† For PHY 213, 214, 285 and 286 (8 credits), students may substitute MCE 161 and 261 (or 162 and 263) and ELE 210 (9 credits).

CHE 313 Chemical Engineering Thermodynamics	3
CHM 432, 336 Physical Chemistry and Laboratory	5
ELE 220 Electric Circuits, Measurements and Electronics	3
MTH 244 Differential Equations	3
	17

JUNIOR YEAR

First Semester

CHE 314 Chemical Engineering Thermodynamics	3
CHE 322 Chemical Process Analysis	1
CHE 328 Industrial Plants	1
CHE 344 Introduction to Transfer Rates	3
CHM 227 Organic Chemistry Lecture	3
Approved mathematics elective	3
General education elective in Division A, C or D	3
	17

Second Semester

CHE 332 Physical Metallurgy or *Approved professional elective	3
CHE 343 Mass Transfer Operations	3
CHE 425 Process Dynamics and Control	3
CHM 228 Organic Chemistry Lecture	3
CHM 226 Organic Chemistry Laboratory	2
General education elective in Division A, C or D	3
	17

SENIOR YEAR

First Semester

CHE 345 Chemical Engineering Laboratory or *Approved professional elective	2
CHE 351 Plant Design and Economics	3
CHE 464 Industrial Reaction Kinetics	3
NUE 581 Introduction to Nuclear Engineering or PHY 340 Introduction to Modern Physics	3
General education elective in Division A, C or D	3
Free elective	3
	17

Second Semester

CHE 346 Chemical Engineering Laboratory	2
CHE 352 Plant Design and Economics	3
*Approved professional elective	3
CVE 220 Mechanics of Materials or *Approved professional elective	3
General education elective in Division A, C or D	3
Free elective	3
	17

Total credits required: 136

CIVIL AND ENVIRONMENTAL ENGINEERING

The Department of Civil and Environmental 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 also offered by the department are described in the *Graduate School Bulletin.*

FACULTY: Associate Professor McEwen, *chairman.* Professors Campbell and Nacci; Associate Professors Gentile, Lavelle, Moultrop and Poon; Assistant Professors Fang, Kelly, Marcus, Sussman and Wang.

The civil engineer is responsible for the planning, design, construction, management and research and development of systems which are necessary to satisfy the demands of modern civilization. Water supply and distribution, sewerage, solid waste disposal, air pollution, transportation systems, foundations for both land and ocean structures, dams, dock facilities and offshore towers, and buildings and bridges of many types are among the civil engineer's responsibilities.

The curriculum provides the student 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 his last two years the student has a large degree of flexibility in developing his own program to meet his own professional goals through the selection of professional electives in environmental engineering, soil mechanics and foundations, structural engineering, and transportation and construction.

Those students interested in the application of

* These courses must be chosen with the approval of the adviser designated by the department. Areas of concentration include general chemical engineering, bioengineering, materials engineering, nuclear engineering, and pollution control.

civil engineering to the ocean and coastal zone, may select professional electives in Ocean Engineering.

Each student is required near the completion of both the sophomore and junior years to file a proposed plan of study which has been approved by his faculty adviser and the department.

The following courses are required for graduation. While the sequence in which the courses are taken may be modified, the order shown below is recommended.

FRESHMAN YEAR

First Semester

CHM 101 General Chemistry	3
CHM 102 Chemistry Laboratory	1
EGR 101 Introduction to Engineering or EGR 102 Basic Graphics	1
MTH 141 Introductory Calculus with Analytic Geometry	3
General education electives in Division A, C or D	6
	14

Second Semester

Natural science elective	3-5
EGR 101 Introduction to Engineering or EGR 102 Basic Graphics	1
MTH 142 Intermediate Calculus with Analytic Geometry	3
*MCE 162 Statics or MCE 161 Mechanics I or PHY 213 and 285 Elementary Physics and Physics Laboratory	3-4
General education electives in Division A, C or D	6
	16-19

SOPHOMORE YEAR

First Semester

MTH 243 Calculus and Analytic Geometry	3
ELE 210 Introduction to Electrical Engineering	3
MCE 263 Dynamics	3
CVE 216 Metronics	3
CVE 301 Introduction to Professional Practice in Civil Engineering	0
General education elective in Division A, C or D	3
	15

* It is recommended that MCE 162 Statics be selected.

Second Semester

MTH 244 Differential Equations	3
PHY 340 Modern Physics	3
GEL 302 Engineering Geology	3
CVE 220 Mechanics of Materials	3
CVE 302 Introduction to Professional Practice in Civil Engineering	0
General education elective in Division A, C or D	3
	15

JUNIOR YEAR

First Semester

CVE 322 Civil Engineering Laboratory I	2
MCE 354 Fluid Mechanics	3
CVE 303 Introduction to Professional Practice in Civil Engineering	0

Second Semester

CVE 323 Civil Engineering Laboratory II	2
CVE 304 Introduction to Professional Practice in Civil Engineering	0

SENIOR YEAR

First Semester

CVE 305 Introduction to Professional Practice in Civil Engineering	0

Second Semester

CVE 306 Introduction to Professional Practice in Civil Engineering	0

The remaining courses in the junior and senior years shall be selected by the student to satisfy the following requirements:

Core courses. Each student must select at least five of the following:

CVE 315 Surveying
CVE 334 Construction Planning and Specifications
CVE 346 Transportation Engineering
CVE 350 Structural Analysis I
CVE 374 Environmental Engineering I
CVE 380 Soil Mechanics
CVE 396 Civil Engineering Analysis
CPL 410 Fundamentals of Urban Planning

Mathematical science elective. Each student must select at least one course at the 400 level or above in mathematics, statistics or operations research.

Professional electives. Each student, in consultation with his adviser and with the approval of the department, selects at least 24 credits of professional electives from course in engineering, computer science, the sciences, social sciences, community planning, or other areas appropriate to a program in civil and environmental engineering.

General education and free electives. An additional 9 credits in Division A, C or D are required to complete the University general education requirements and all students in the University must select 6 credits of free electives.

Total credits required: 124-127

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 also offered by the department are described in the *Graduate School Bulletin.* For the B.S. degree the students may elect a general program or an emphasis option in the areas listed on page 77.

FACULTY: Professor Polk, *chairman.* Professors Lengyel, Lindgren, Mitra and Tufts; Visiting Professor Seely; Associate Professors Etzold, Haas, Jaron, Markdix, Poularikas, Prince, Sadasiv and Spence; Assistant Professors Birk, Daly and Kelley; Instructor Franklin; Adjunct Professors Biberman, Hall, Kazan, D. Middleton, Stuermer and Zirkind.

Electrical engineers work in all areas in which electrical phenomena are involved. These areas include communication systems, computers, control systems, quantum electronics and electro-optics, electro-acoustics, energy conversion, antennas and radio propagation, design of electronic devices, and bioengineering.

Since electrical instrumentation is at the heart of modern science and technology—electrical engineers are not only employed in the computer, electronics, communications and power industries, but may also be found in 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 atomic physics and the behavior of the solid state, electromagnetic theory and electronics. Creative use of scientific principles in problems of engineering design is stressed particularly in the senior year. Digital computer techniques are 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 "hard-

ware." Separate undergraduate laboratories are available for electrical measurements, electronics, pulse and digital circuits, computer graphics, microwaves and quantum electronics, materials, energy conversion, and systems. Selected students participate in advanced projects including image-tube analysis, micro-electronics, investigation of optical properties of solids, optical and radio propagation, acoustics, computers and biological instrumentation.

Electrical engineering students should also note that the four-year electrical engineering curriculum allows for 9 credits of completely free electives which do not have to satisfy any of the general education requirements. It is recommended, however, that elective courses be selected to satisfy the general education requirements in Divisions A, C and D (27 credits) as early as possible. Although Division B requirements of 18 credits will be satisfied automatically by courses specified in the electrical engineering curriculum, it is recommended that students take some additional natural science such as ZOO 111, AST 108, BOT 111, GEL 103, or courses in mathematics or physics for which prerequisites have been satisfied. In choosing electives students may also consider Division D courses in communications.

FRESHMAN YEAR

First Semester

*CHM 101 General Chemistry Lecture I	3
*CHM 102 Laboratory for CHM 101	1
EGR 101 Introduction to Engineering and/or EGR 102 Basic Graphics	1-2
MTH 141 Introductory Calculus with Analytic Geometry	3
General education electives in Division A, C or D	6
	14-15

Second Semester

Natural science elective in Division B	3
MTH 142 Intermediate Calculus with Analytic Geometry	3
EGR 102 Basic Graphics *if not taken in first semester*	0-1
MCE 161 Mechanics I *preferred* or MCE 162 Statics or PHY 213 and 285 Elementary Physics and Physics Laboratory	3-4
General education electives in Division A, C or D	6
	15-17

SOPHOMORE YEAR

First Semester

†MTH 243 Calculus and Analytic Geometry of Several Variables	3
†ELE 210 Introduction to Electricity and Magnetism	3
†MCE 263 Dynamics	3
PHY 223 Introduction to Acoustics and Optics	3
General education elective in Division A, C or D or Free elective	3
	15

Second Semester

†ELE 211 Linear Systems and Circuit Theory I	3
†ELE 215 Electrical Measurements	2
CSC 201 Introduction to Computing	3
PHY 341 Modern Physics I	3
General education electives in Division A, C or D or Free electives	6
	17

JUNIOR YEAR

First Semester

ELE 312 Linear Systems and Circuit Theory II	4
ELE 322 Electromagnetic Fields I	3
MTH 362 Linear and Complex Analysis for Scientists and Engineers	3
PHY 342 Modern Physics II	3
General education elective in Division A or C	3
	16

Second Semester

ELE 313 Linear Systems	3
ELE 323 Electromagnetic Fields II	3
ELE 342 Electronics I	4
MCE 341 Fundamentals of Thermodynamics or PHY 420 Introduction to Thermodynamics and Statistical Mechanics	3

* Required for graduation and recommended for freshman year, but *not* a prerequisite for the electrical engineering courses of the sophomore and junior years.

† Prerequisite for advanced work in electrical engineering and should be taken before the junior year.

General education elective in Division A or C	3
	16

SENIOR YEAR

A student may elect either the general program which is described below or specialize in one of the following emphasis areas: biomedical engineering, communication and control systems, computer technology, microwaves and quantum electronics, or solid state theory and applications.

A student who selects an emphasis area registers for the appropriate emphasis laboratory and for two applicable emphasis courses. He also chooses two professional electives either to obtain greater depth in his emphasis area or to achieve breadth in his engineering knowledge. Professional electives must be courses in engineering, computer science, mathematics, physical science or a life science approved by the student's adviser.

The selection of the general program must be made after discussion with academic advisers, emphasis area advisers and other faculty. Each student must file (on a form available from the department office) before spring registration for the first semester of the senior year a detailed program of studies which is approved by his emphasis area adviser. Those who elect the general program must obtain approval of their course selections from their regular adviser. Students formally enrolled in the Honors Program remain with the honors adviser of the department who approved their individually determined programs.

First Semester

ELE 443 Electronics II	5
Emphasis course	3
Professional elective or emphasis laboratory	3
Free elective	3
	14

Second Semester

Emphasis course	3
Emphasis laboratory or professional elective	3
Professional elective	3
Free electives	6
	15

Total credits required: 123-124

The general program for the senior year in electrical engineering consists of ELE 443 (5 credits) and 444 (4 credits) and four of the following three-credit courses: ELE 411, 427, 431, 436, 437, 457 or MCE 417.

Emphasis courses and laboratories are indicated below. In each area two emphasis courses and one emphasis laboratory are required. Additional selections from among the emphasis courses and laboratories may be taken as professional or free electives. Course sequences must be scheduled so as to satisfy prerequisites.

Biomedial Engineering emphasis courses include in the first semester, ELE 586 or 588 or 482 and 581, ZOO 345, ELE 457; in the second semester, ELE 587 or 589 or ZOO 484, ELE 436, ELE 458.

Communication and Control Systems emphasis courses include in the first semester, ELE 457, ELE 427 or 501 or 509 or 581 or 520, and professional electives from ELE 411, 431, 437, 482, 505, 586, 588, MTH 215, CSC 410; in the second semester, ELE 436, ELE 444 or 506 or 561 or MCE 417 or ZOO 484, and professional electives from CSC 411, 500, 525, 551, ELE 538, 545, ELE 458 or 444.

Computer Technology emphasis courses include in the first semester, CSC 410, MTH 215 or 451 or ELE 509 or 581 or 501, CSC 411; in the second semester, ELE 444, ELE 436 or 506 or 561, CSC 411 or ELE 444.

Microwaves and Quantum Electronics emphasis courses include in the first semester, ELE 411, ELE 431 or 427 or 437 or 511 or 520 or CSC 410 or MCE 517, ELE 413; in the second semester, ELE 432 or 436 or 444 or 458 or 514 or 515 or 516 or 538 or 539 or 545 or MCE 417.

Solid State Theory and Applications emphasis courses include in the first semester, ELE 431, ELE 411 or 437 or 511 or 520 or MCE 517; in the second semester, ELE 432, ELE 436 or 444 or 515 or 538 or 539 or CHE 437; ELE 433.

ENGINEERING SCIENCE

The curriculum in engineering science is designed to allow more concentration in the basic sciences, engineering sciences, and interdisciplinary areas than is possible in the regular engineering curriculums. The degree earned is the bachelor of science (B.S.).

A core of required courses in the basic and engineering sciences provides the necessary foundation for further work in these areas. The 12 to 15 credits of specialized electives plus 6 credits of free electives afford ample opportunity for concentration, which may be in any one of the five undergraduate engineering departments, in mathematics, or in physics; or it may be in some interdisciplinary area cutting across two departments,

one of which may not necessarily be in engineering.

With the proper choice of electives, this curriculum would prepare the student for either a professional career in industry or for graduate school.

FRESHMAN YEAR

First Semester

CHM 101 General Chemistry Lecture I	3
CHM 102 Laboratory for CHM 101	1
EGR 101 Introduction to Engineering or EGR 102 Basic Graphics	1
MTH 141 Introductory Calculus with Analytic Geometry	3
General education electives in Division A, C or D	6
	14

Second Semester

CHM 112 General Chemistry Lecture II	3
CHM 114 Laboratory for CHM 112	1
EGR 101 Introduction to Engineering or EGR 102 Basic Graphics	1
MTH 142 Intermediate Calculus with Analytic Geometry	3
MCE 161 Mechanics or MCE 162 Statics or PHY 213 and 285 Elementary Physics and Physics Laboratory	3-4
General education electives in Division A, C or D	6
	17-18

SOPHOMORE YEAR

First Semester

CHM 227, 229 Organic Chemistry or CHM 431, 335 Physical Chemistry	4-5
ELE 210 Introduction to Electrical Engineering	3
MTH 243 Calculus and Analytic Geometry of Several Variables	3
MCE 263 Dynamics	3
PHY 223 Introduction to Acoustics and Optics	3
	16

Second Semester

CHM 228, 230 Organic Chemistry or CHM 432, 336 Physical Chemistry	4-5
CVE 220 Mechanics of Materials	3
ELE 211 Linear Systems and Circuit Theory I	3
MTH 244 Differential Equations	3
PHY 341 Modern Physics I	3
	16-17

JUNIOR YEAR

First Semester

ELE 312 Linear Systems and Circuit Theory II	4
ELE 322 Electromagnetic Fields I	3
MCE 341 Fundamentals of Thermodynamics	3
PHY 342 Modern Physics II	3
General education elective in Division A, C or D	3
	16

Second Semester

CHE 344 Introduction to Transfer Rates	3
ELE 323 Electromagnetic Fields II or *Professional elective	3
ELE 342 Electronics I	4
*Professional elective	3
General education elective in Division A, C or D	3
	16

SENIOR YEAR

First Semester

CHE 332 Physical Metallurgy or ELE 431 Electrical Engineering Materials	3
*Professional electives	9
General education elective in Division A, C or D	3
Free elective	3
	18

Second Semester

CHE 425 Process Dynamics and Control or ELE 457 Feedback Control Systems or MCE 428 Mechanical Control Systems	3
*Professional electives	6

* Professional electives shall include at least 3 credits of mathematics. Students planning to do graduate work in biomedical engineering should take either ZOO 111 or BIO 101 before the senior year.

General education electives in Division A, C or D	6
Free elective	3
	18

Total credits required: 131-133

INDUSTRIAL ENGINEERING

The Department of Industrial Engineering offers a curriculum leading to the 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*.

FACULTY: Professor C. James, *chairman*. Professor Nichols; Associate Professors Black, Lawing and Rubinsky; Assistant Professors Branson, Lawson and Shao.

This curriculum is designed to provide a solid background in mathematics, basic science, and engineering science, plus a carefully coordinated set of courses that are of particular importance to the professional industrial engineer. Mathematical modeling of physical systems, optimization, probability and random variables, materials processing, and metrology are areas that receive considerable attention. These areas of study are augmented with computer science education and are used by the student in his assignments in a series of problem courses. In addition, professional electives have been carefully located in the curriculum.

From the sophomore through the senior years, the curriculum consists of five courses each semester which means that the number of courses per week requiring preparation will never exceed five, with the exception of the free electives requirement which may be fulfilled at any time.

Upon completion of the curriculum requirements, the student will be amply prepared to pursue a career in the many engineering opportunities in industry, transportation, government, hospitals, and service organizations. The curriculum also provides an excellent background for further formal study in industrial engineering or related fields of physical science.

FRESHMAN YEAR

First Semester

*CHM 101 and 102 General Chemistry I and Chemistry Laboratory or CHM 191 General Chemistry	4-5
EGR 101 Introduction to Engineering or EGR 102 Basic Graphics	1
MTH 141 Introductory Calculus with Analytic Geometry	3
General education electives in Division A, C or D	6
	14-15

Second Semester

Natural science elective	3-5
EGR 102 Basic Graphics or EGR 101 Introduction to Engineering	1
MTH 142 Intermediate Calculus with Analytic Geometry	3
*MCE 162 Statics or PHY 213 and 285 Elementary Physics and Physics Laboratory	3-4
General education electives in Division A, C or D	6
	16-19

SOPHOMORE YEAR

First Semester

CSC 201 Introduction to Computing	3
ELE 210 Introduction to Electrical Engineering	3
IDE 220 Industrial Engineering I	3
MCE 263 Dynamics	3
MTH 215 Introduction to Algebraic Structures	3
	15

Second Semester

ECN 123 Elements of Economics	3
ELE 220 Electric Circuits, Measurements and Electronics	3
IDE 221 Industrial Engineering II	3
MTH 243 Calculus and Analytic Geometry of Several Variables	3
PHY 223 Introduction to Acoustics and Optics	3
	15

JUNIOR YEAR

First Semester

IDE 411 Engineering Statistics I	3
MCE 341 Fundamentals of Thermodynamics	3
MTH 361 Mathematical Methods for Scientists and Engineers	3
PHY 340 Introduction to Modern Physics or PHY 341 Modern Physics I	3

* Preferred for industrial engineers.

General education elective in Division A, C or D	3
	15

Second Semester

CVE 220 Mechanics of Materials	3
IDE 412 Engineering Statistics II	3
IDE 432 Operations Research I	3
MCE 354 Fluid Mechanics	3
General education elective in Division A, C or D	3
Free elective	3
	18

SENIOR YEAR

First Semester

CHE 437 Materials Engineering or CHE 333 Engineering Materials	3
IDE 350 Industrial Engineering Systems Design I	3
IDE 433 Operations Research II	3
*Professional elective or *Free elective	3
General education elective in Division A, C or D	3
	15

Second Semester

ACC 305 Accounting Principles	3
IDE 351 Industrial Engineering Systems Design II	3
IDE 440 Materials Processing and Metrology	3
*Professional elective or *Free elective	3
General education elective in Division A, C or D	3
	15

Total credits required: 123-127

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 and applied mechanics and, in cooperation with the Department of Ocean Engineering, offers a curriculum leading to the bachelor of science (B.S.) degree in mechanical and ocean engineering. 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 C. Nash, *chairman.* Professors Bradbury, G. Brown, Conta, Dowdell, Ferrante, Schenck, Test and F. White; Associate Professors Bachelder, DeLuise, Goff, Hagist, Hatch, Kim, Parker, Velletri and M. Wilson; Assistant Professors Lessmann and Palm.

This curriculum provides a foundation in basic science, mathematics, engineering science, and general education to prepare the graduate to enter a professional engineering career in a wide range of industries and laboratories which utilize the talents of mechanical engineers. The curriculum is also excellent preparation for graduate school.

The work in the first two years typically consists of basic courses in pure science (mathematics, physics, chemistry, electives), applied science (mechanics, electricity and magnetism, computer science), and general education (arts, humanities, social sciences, communication).

The junior year concentrates upon fundamental courses in mechanical engineering science (thermodynamics, fluid mechanics, systems and design, engineering analysis), plus further general education studies (divisions A, B, C or D). The senior year allows the student to choose between two professional programs of study: (1) mechanical engineering, and (2) ocean engineering. These programs are supplemented by professional electives, free electives, and the completion of the University general education studies. Both programs provide a good foundation for further graduate studies.

In the last five semesters, the student takes an integrated series of five laboratory courses which introduce him to laboratory technique and practical experience with the physical and engineering phenomena which are being covered in concurrent courses. In the senior year, the student carries out an individual project to develop creative ability and integrate the formal studies.

It is the responsibility of each student, in the consultation with his or her adviser, to select electives in such a way as to satisfy the University's general education requirements. The recommended curriculum which follows suggests a procedure for doing this.

No specific courses are required for students from University College who desire to enter the Department of Mechanical Engineering and Applied Mechanics. However, the following

* A professional elective and a free elective are required in the senior year.

list of courses contains all of the prerequisites for a degree in mechanical engineering and should be taken during the first three semesters: CSC 201 (3 credits); EGR 102 (1); MCE 162, PHY 223 and ELE 210 or PHY 213, 285, 214 and 286 (8-9); MCE 263 (3); MTH 141, 142 and 243 (9); Division B electives, except mathematics but including CHM 101 and 102 which are required for graduation (7); Division A, C or D electives (15) for a total of 46-47 credits.

To receive the bachelor of science degree in mechanical engineering and applied mechanics, a student must satisfactorily complete all the courses in the following recommended curriculum, although he is allowed to change the sequence.

FRESHMAN YEAR

First Semester

CHM 101 General Chemistry	3
CHM 102 Chemistry Laboratory	1
EGR 101 Introduction to Engineering or EGR 102 Basic Graphics	1
MTH 141 Introductory Calculus with Analytic Geometry	3
General education electives in Division A, C or D	6
	14

Second Semester

Natural science elective	3
EGR 101 Introduction to Engineering or EGR 102 Basic Graphics	1
MTH 142 Intermediate Calculus with Analytic Geometry	3
MCE 162 Statics or PHY 213 and 285 Elementary Physics and Physics Laboratory	3-4
General education electives in Division A, C or D	6
	16-17

SOPHOMORE YEAR

First Semester

CSC 201 Introduction to Computing	3
ELE 210 Introduction to Electrical Engineering	3
MTH 243 Calculus and Analytic Geometry of Several Variables	3
MCE 263 Dynamics	3
General education elective in Division A, C or D	3
*Free elective	3
	18

Second Semester

CVE 220 Mechanics of Materials	3
ECN 123 Elements of Economics	3
ELE 220 Electric Circuits, Measurements and Electronics	3
MTH 244 Differential Equations	3
MCE 212 Mechanical Engineering Laboratory I	1
PHY 223 Introduction to Acoustics and Optics	3
	16

JUNIOR YEAR

First Semester

MCE 313 Mechanical Engineering Laboratory II	1
MCE 323 Kinematics	3
MCE 341 Fundamentals of Thermodynamics	3
MCE 372 Engineering Analysis I	3
PHY 341 Modern Physics I	3
General education elective in Division A, C or D	3
	16

Second Semester

MCE 314 Mechanical Engineering Laboratory III	1
MCE 342 Mechanical Engineering Thermodynamics	3
MCE 354 Fluid Mechanics	3
MCE 366 Introduction to Systems Engineering	3
MCE 373 Engineering Analysis II	3
General education elective in Division A, C or D	3
	16

SENIOR YEAR

First Semester

CHE 333 Engineering Materials	3
MCE 315 Mechanical Engineering Laboratory IV	1
MCE 423 Design of Machine Elements	3
MCE 448 Heat and Mass Transfer	3
Professional electives	6
	16

Second Semester

MCE 316 Mechanical Engineering Laboratory V	1

* Free electives may be taken at any time selected by the student.

MCE 429 Comprehensive Design	3
Professional electives	6
*Free elective	3
General education elective in Division A, C or D	3
	16

Total credits required: 128-129

OCEAN ENGINEERING

The Department of Chemical 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 or mechanical and ocean engineering 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 Sheets, *chairman.* Professors G. Brown, Middleton, Nacci, Schenck, and F. White; Associate Professors Haas, Kowalski and Rose; Assistant Professors LeBlanc and Moffett; Adjunct Assistant Professor DiNapoli.

CHEMICAL AND OCEAN ENGINEERING

Students enrolled in this curriculum will follow the program of study for chemical engineering (page 72) during the freshman, sophomore and junior years.

SENIOR YEAR

First Semester

**CHE 351 Plant Design and Economics	3
CHE 403 Introduction to Ocean Engineering Processes I	3
CHE 464 Industrial Reaction Kinetics	3
CHE 534 Corrosion and Corrosion Control	3
OCG 401 General Oceanography	3
General education elective in Division A, C or D	3
	18

Second Semester

**CHE 352 Plant Design and Economics II	3
CHE 404 Introduction to Ocean Engineering Processes II	3
OCE 410 Basic Ocean Measurements	3
General education elective in Division A, C or D	3
Free electives	6
	18

MECHANICAL AND OCEAN ENGINEERING

Students enrolled in this curriculum will follow the program of study for mechanical engineering and applied mechanics (page 80) during the freshman, sophomore and junior years.

SENIOR YEAR

First Semester

MCE 401 Introduction to Ocean Engineering Systems I	3
MCE 423 Design of Machine Elements	3
CHE 333 Engineering Materials	3
OCG 401 General Oceanography	3
PHY 425 Acoustics	3
PLP 377 Biological Aspects of Water Quality	3
	18

Second Semester

MCE 402 Introduction to Ocean Engineering Systems II	3
OCE 410 Basic Ocean Measurements	3
General education elective in Division A, C or D	3
†Ocean-related engineering or science elective	3
Free elective	3
	15

URBAN AFFAIRS

The curriculum in Urban Engineering is part of the newly created, interdisciplinary Urban Affairs Program (see page 10). It is designed to prepare students for systems oriented activities in the analysis and solution of urban problems. Beginning with core work in mathematics, physics, chemistry and zoology, the curriculum includes computer science, ecology, systems engineering and operations research, as well as work in the social sciences and humanities which provide a general understanding of contemporary urban society. The curriculum includes a summer internship at the end of the junior year and a Senior Seminar which brings together students in urban affairs concentrations from all parts of the University.

Students who wish to major in this curriculum should consult the appropriate member of the

* See footnote on page 81.

** CHE 351, 352 will include applications to ocean engineering problems for students selecting the Chemical and Ocean Engineering Program.

† The ocean-related elective is chosen by the candidate in consultation with his adviser.

Urban Affairs Program Coordinating Committee (listed on page 242) for assistance in the formulation and approval of their curriculums.

FRESHMAN YEAR

First Semester

MTH 141 Introduction to Calculus and Analytic Geometry	3
*PHY 213 Elementary Physics	3
*PHY 285 Physics Laboratory	1
CHM 103 General Chemistry Lecture I	3
CHM 105 Laboratory for CHM 103	1
†General education elective in Division A	3
	14

Second Semester

MTH 142 Intermediate Calculus with Analytic Geometry	3
*PHY 214 Elementary Physics	3
*PHY 286 Physics Laboratory	1
CHM 124 Organic Chemistry	4
EGR 102 Basic Graphics	1
†General education elective in Division A	3
	15

SOPHOMORE YEAR

First Semester

MTH 243 Calculus and Analytic Geometry of Several Variables	3
CVE 220 Mechanics of Materials	3
ZOO 111 General Zoology	4
SOC 202 General Sociology	3
†General education elective in Division A	3
	16

Second Semester

MTH 244 Differential Equations	3
CSC 201 Introduction to Computing	3
ZOO 242 Introductory Human Physiology	3
SOC 204 Social Psychology	3
ART 260 Short History of Architecture	3
	15

JUNIOR YEAR

First Semester

CHE 333 Engineering Materials	3
MCE 341 Fundamentals of Thermodynamics	3
MCE 372 Engineering Analysis I	3
ZOO 262 Introductory Ecology	3
ECN 123 Elements of Economics	3
	15

Second Semester

MCE 366 Introduction to Systems Engineering	3
ACC 201 Elementary Accounting	3
SOC 338 Population Problems	3
SOC 434 Urban Sociology	3
Professional elective	3
	15

SENIOR YEAR

First Semester

IDE 432 Operations Research I	3
CVE 346 Transportation Engineering	3
Free elective	3
Professional electives	6
Urban Affairs Seminar	3
	18

Second Semester

IDE 433 Operations Research II	3
CVE 374 Environmental Engineering I	3
Free elective	3
Professional electives	6
	15

Total credits required: 128

* PHY 111, 112 General Physics (4 cr. each) may be substituted for PHY 213, 214, 285 and 286.

† A 3-credit course in communications (Division D) may be substituted for one of the general education courses in Division A.

College of Home Economics

BEVERLY DOWNING CUSACK, *Dean*

Study in home economics provides professional and pre-professional education for both men and women as well as opportunity for development of the individual as a person, a citizen and for home and family living.

The program of study includes work in the biological, physical and social sciences, the humanities and home economics. Opportunity for exploration is provided with students choosing their major fields of study at the end of the sophomore year. The degree of Bachelor of Science is awarded upon satisfactory completion of the curriculum. All programs are available to both men and women.

The curriculum requirements listed below are arranged in three groups. Group I includes general education courses, Group II includes home economics courses required of all students in the College, and Group III includes those courses required for the major emphasis. The maximum course load is 18 credits per semester. A student on probation may register for no more than 15 credits per semester.

A total of 128 credits is required for graduation.

CURRICULUM REQUIREMENTS

GROUP I GENERAL EDUCATION, 45 credits

Students are required to select and pass 45 credits of course work from the general education requirements as listed on page 9. Specific requirements of the College in each division are listed below:

Division A (18, 15, or 12 credits). Home economics students must take one course in art, music or theatre; one course in literature.

Division B (18, 15, or 12 credits). Home economics students must take one course in biological sciences and two courses in chemistry (CHM 103, 105 and CHM 124).

Division C (18, 15, or 12 credits). Home economics students must take one course in economics and two courses in psychology and/or sociology.

GROUP II HOME ECONOMICS CORE, 24 credits

CDF 150 Personal Development	3
CDF 200 Growth and Development of Children or CDF 302 Adolescent Growth and Development or CDF 340 Family and Community Health or CDF 355 Marriage and Family Relationships	3
FNS 101 Introductory Food Study	3
FNS 207 General Nutrition	3
HMG 210 Management in Family Living	3
HMG 320 Family Economics or HMG 340 Family Housing or HMG 370 Home Management Residence or HMG 371 Seminar in Home Management	3

TXC 103 Consumer Problems in Textiles and Clothing	3
TXC 205 Introductory Clothing or TXC 206 Home Furnishings or TXC 224 Clothing and Human Behavior or TXC 238 Textile Design or TXC 303 General Textiles or TXC 340 Historic Costume	3
HEC 001 Survey in Home Economics	0

CHILD DEVELOPMENT AND FAMILY RELATIONS

The Department of Child Development and Family Relations offers a curriculum leading to the 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.*

FACULTY: Associate Professor Cohen, *chairman.* Professors Fitzelle and R. C. Smart; Assistant Professors Blood, Conforti, Cooper, Greene, Kohut, Lapin, K. Schroeder and L. S. Votta; Adjunct Professor M. S. Smart.

This curriculum provides a general background for work with children and families, building on the Home Economics Core (Group II) and in conjunction with the 26 elective credits necessary to complete the total of 128 credits required for graduation. Courses in Group II not chosen to fulfill the core requirements should be considered for inclusion among the elective credits.

Most professions that deal with children and families require academic work beyond the bachelor's degree for continuing professional work and advancement. Individuals with a baccalaureate degree are employed as pre-professionals, however, in nursery schools, day care centers, institutions and hospitals for children, recreational, child guidance, case work and other community agencies. Similarly, some of the courses in the curriculum plus certain others in education, meet the requirements for the Provisional Nursery-Kindergarten Certificate in Rhode Island. The Professional Certificate requires successful teaching experience for five years and additional academic work.

GROUP III

In addition to the courses listed in Groups I and II, the courses listed below are required:

*CDF 270 Introduction to Work with Children	3
CDF 340 Family and Community Health	3
CDF 355 Marriage and Family Relationships	3
CDF 390 Contemporary Philosophies of Guiding Children	3
CDF 400 Child Development: Advanced Course or CDF 450 Family Interaction	3

Any courses in the College of Home Economics or related areas, except EDC 484 and CDF 375, with a maximum of 6 credits in any one area outside Home Economics, subject to the approval of the department, for a total of 15

Students who wish to meet the requirements for the Provisional Nursery-Kindergarten Certificate in Rhode Island should apply at the end of the fourth semester for permission to take EDC 484, and should plan to take the following courses in addition to Group III:

EDC 102 Introduction to American Education	3
EDC 312 The Psychology of Learning	3
CDF 330 Curriculum for Young Children	3
CDF 370 Nursery School Practicum	4
EDC 484 Supervised Student Teaching	8
EDC 485 Seminar in Teaching	3

Students interested in pre-professional training in social work should plan to take the following sequence of courses: SWF 311, SWF 313, CDF 375, and SWF 317. They should apply at the end of the fourth semester for permission to take CDF 375.

FOOD AND NUTRITIONAL SCIENCE

The Department of Food and Nutritional Science offers a curriculum leading to the 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.*

FACULTY: Professor Dymsza, *chairman.* Associate Professors Bacon and Constantinides; Assistant Professors Bergan, Caldwell and Goshdigian; Instructor Blecharczyk; Adjunct Professor G. Silverman.

* Since CDF 200 is prerequisite to CDF 270, CDF 200 should be selected as the second course in child development and family relations in Group II.

This curriculum, open to both men and women, offers a broad general study program or specific options as follows:

Dietetics. This program of study meets the requirements of American Dietetic Association approved dietetic internships.

Nutritional Science. Individual programs of study can be prescribed to provide both the broad scientific background and the specialized training necessary for a career in modern nutrition research, education or service.

Food Services Administration and Institution Management. Programs in these areas can be arranged in cooperation with the College of Business Administration.

Programs of study are designed to prepare students as therapeutic or administrative dietitians, food and nutrition research technicians and scientists, quality food service and institution managers, and test kitchen, taste panel and consumer education specialists. Qualified students can prepare for graduate studies.

GROUP III

In addition to the courses listed in Groups I and II, the following courses are required:

FNS 221 Meal Management	3
FNS 331 Advanced Food Study	3
FNS 337 Introductory Food Science	3
FNS 441 Advanced Human Nutrition	3
FNS 445 Readings in Nutrition	2
or	
FNS 504 Food Science and Nutrition Seminar	3

Students planning to major in food and nutritional science should contact the department as soon as possible in order to plan a curriculum to meet individual professional needs. The requirements for a major in the department must include a total of 29-35 credit hours in food and nutritional science and related areas, subject to the approval of the department.

Students who wish to qualify for American Dietetic Association approved internships, or meet the undergraduate curriculum standards established by the Institute of Food Technologists, must meet certain specified requirements.

It is recommended that students interested in food and nutritional science take BIO 102 or ZOO 111 instead of BIO 101 to meet the prerequisites for ZOO 242 and 244.

FOOD SCIENCE AND TECHNOLOGY

This intercollege and interdepartmental program, that follows a course of study meeting the educational standards established by the Institute of Food Technologists, is described under Interdepartmental Study on page 10.

GENERAL HOME ECONOMICS

The curriculum in general home economics leads to the bachelor of science (B.S.) degree. It provides for general education in all areas of home economics and for professional fields such as home economics extension, social work, journalism, radio and other types of work requiring, in addition to a general background in home economics, training which can best be provided by other departments in the University.

Students interested in pre-professional training in social work may enroll in either the general home economics or the child development and family relations curriculum. They should plan to take the following sequence of courses: SWF 311, SWF 313, CDF 375, SWF 317.

GROUP III

The following courses are required in addition to the courses listed in Groups I and II:

ART 120 Introduction to Art or TXC 406 House Planning	3
CDF 340 Family and Community Health	3
CDF 270 Introduction to Work with Children	3
TXC 206 Home Furnishings	3
HMG 350 Household Equipment	3
HMG 370 Home Management Residence or HMG 371 Seminar in Home Management	3
Textiles and clothing elective	3

HOME ECONOMICS EDUCATION

The curriculum in home economics education is interdepartmental within the College of Home Economics and students earn the bachelor of science (B.S.) degree. The master of science (M.S.) degree in home economics education, also offered by the college is described in the *Graduate School Bulletin.*

FACULTY: Associate Professor P. Kelly, *director.* Associate Professors MacKenzie and May; Assistant Professor Cooper.

This curriculum meets the state of Rhode Island requirements for certification. Supervised teaching is included in the program during the senior year.

GROUP III

In addition to the courses listed under Groups I and II, the following courses are required:

CDF elective	3
EDC 102 Introduction to American Education	3
EDC 312 Psychology of Learning	3
EDC 334 Teaching of Home Economics	3
EDC 337 Teaching of Home Economics	3
EDC 484 Supervised Teaching of Home Economics	8
EDC elective	2
FNS 221 Meal Management	3
HMG elective	3
TXC elective (must include advanced clothing construction)	3

Note: TXC 205 and HMG 370 or HMG 371 (married students only) are required and should be elected from the core choices.

HOME MANAGEMENT

The Department of Home Management does not offer a curriculum but does provide courses for students in other curriculums in the College of Home Economics.

FACULTY: Professor Crandall, *chairman*. Assistant Professor Noring; Instructors Goertz and Jackson.

TEXTILES, CLOTHING AND RELATED ART

The Department of Textiles, Clothing and Related Art offers a curriculum leading to the 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*.

FACULTY: Professor V. V. Carpenter, *chairman*. Associate Professor Fry; Assistant Professors Gilbert, Harabin, Helms, Thomas and Weeden; Instructor Avery; Curator Kaye.

This curriculum is planned for students with ability and professional interest in the artistic and technical aspects of textiles, clothing and related art.

GROUP III

In addition to the courses listed under Groups I and II, the courses listed below are required:

TXC 224 Clothing and Human Behavior	3
TXC 303 General Textiles	3
TXC 306 Home Furnishings or TXC 327 Apparel Design	3
TXC 433 Textiles and Clothing Industry	3
TXC 440 Historic Textiles	3
TXC 390 Senior Seminar	1
Textiles and clothing electives	6

If a student elects TXC 224 or TXC 303 to meet the home economics core requirements, another 3-credit course in textiles and clothing must be substituted above.

An additional 15 credits, with at least nine in any one area, must be selected from the following: art, education, business, chemistry, home management, journalism, and social science.

URBAN AFFAIRS

The curriculum in Home Economics in the Urban Environment is part of the newly created, interdisciplinary Urban Affairs Program (see page 10). It is designed for students who wish to prepare for careers as urban extension agents or with social service organizations or agencies; and seeks to integrate the General Home Economics curriculum with a program of courses that will contribute to students' understanding of contemporary urban society.

Students who wish to major in this curriculum should consult the appropriate member of the Urban Affairs Program Coordinating Committee (listed on page 242) for assistance in the formulation and approval of their curriculums.

GROUP III

Students must take the courses listed in Group III under General Home Economics.

GROUP IV

In addition to the courses listed under Groups I, II and III, students must take 27-30 credits as follows: (1) eight or nine urban-related courses selected from offerings by departments throughout the University and (2) one or two semesters of work in the Senior Seminar in Urban Affairs.

An additional 8 credits are taken in free (or non-directed) electives.

College of Nursing

BARBARA L. TATE, *Dean*
ELIZABETH L. HART, *Assistant Dean*

The College of Nursing offers a curriculum leading to the bachelor of science (B.S.) degree. The master of science (M.S.) degree also offered by the College is described in the *Graduate School Bulletin*.

FACULTY: Professors Tate and Cumings; Associate Professors Cumberland, Del Papa, Hart, Hirsch, J. Houston, Jacques, Kang and McElravy; Assistant Professors Barden, Bartholomew, Blount, Boger, Castro, Doyle, Fanning, Foglia, Hosford, C. Pearson and Seeley; Instructors Gould, Hames, MacNeill, Mark, Morretti and Smith; Teaching Assistant Congdon.

The baccalaureate program is designed for men and women with academic, personal and professional potential. 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. The curriculum combines the general and professional, providing an understanding of the scientific principles fundamental to nursing and preparing graduates to work with other professionals in health promotion and care in illness. Throughout the curriculum, a foundation is laid for continuing study, during employment in nursing or for full-time graduate study.

The program consists of eight semesters and one summer session. Courses in the nursing curriculum are conducted by College of Nursing faculty members and include observation and clinical practice in cooperating agencies. These agencies include: Rhode Island Hospital, Providence Lying-In Hospital, Veterans Administration Hospital, Metropolitan Nursing Health Services Association of Rhode Island, Rhode Island Medical Center Institute of Mental Health, Miriam Hospital, South County Hospital, Westerly Hospital, Kent County Visiting Nurse Association, Washington County Public Health Nursing Association, Visiting Nurse Service of Pawtucket, Laurel Foster Home, Division of Vocational Rehabilitation, East Shore District Nursing Association, and Northwest Community Nursing and Health Service.

Students in the College of Nursing meet all of the general education requirements of the University as listed on page 9. A grade of C must be achieved in all 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 and one summer session. The use of an automobile is highly recommended during the semester of community health nursing experience.

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

The following courses should be completed during the first three semesters and summer session:

Selected communications courses	6
CHM 103, 105 Introductory Chemistry	4
CHM 124 Organic Chemistry	4
ZOO 121 Human Anatomy	4
ZOO 242, 244 Introductory Human Physiology	4
MIC 201 General Microbiology	4
PHY 102 Fundamental Physics	3
SOC 202 General Sociology	3
PSY 113 General Psychology	3
PSY 232 Developmental Psychology or CFD 200 Growth and Development of Children	3
PHC 225 Pharmaceutical Calculations and Introduction to Pharmacology	2
*NUR 101 Introduction to Nursing	2
*NUR 220 Fundamentals of Nursing	4
FNS 207 General Nutrition	3

The following courses should be completed during the last five semesters:

NUR 231, 232 Care of the Adult I	10
PCL 226 Pharmacology and Therapeutics	2
NUR 301, 302 Maternal and Child Health Nursing	11
NUR 311, 312 Mental Health and Psychiatric Nursing	6
NUR 320 Public Health and Public Health Nursing	7
NUR 331, 332 Care of the Adult II	12
NUR 350 Conference on Professional Nursing	2

* Registered nurse students will take NUR 211 and 3 credits of electives in lieu of NUR 101 and 220.

The following courses should be distributed throughout the program:

General education electives in Division A	12-15
Social science electives (restricted)	6
Additional general education electives in Division C	12-15
Electives	15

Total credits required: 128†

TYPICAL FRESHMAN YEAR

First Semester

CHM 103, 105 Introductory Chemistry	4
SOC 202 General Sociology	3
ZOO 121 Human Anatomy	4
Communication skills	3
	14

Second Semester

CHM 124 Organic Chemistry	4
PSY 113 General Psychology	3
ZOO 242, 244 Introductory Human Physiology	4
NUR 101 Introduction to Nursing	2
Communication skills	3
	16

Registered nurse graduates of hospital or junior college programs in nursing who wish to earn the baccalaureate degree with a major in nursing are admitted to the basic baccalaureate program. Advanced placement credit for courses taken in an institution other than a college or university may be earned by satisfactory completion of departmental examinations offered by the University. Examinations are available in the sciences and in nursing. Requests for application forms and information should be directed to the Office of Admissions, University of Rhode Island, Kingston, R.I. 02881.

† For students admitted in or after September 1972.

College of Pharmacy

HEBER W. YOUNGKEN, JR., *Dean*
DAVID H. CROMBE, *Assistant Dean*

The College of Pharmacy offers a five-year curriculum leading to the bachelor of science (B.S.) degree in pharmacy and a four-year curriculum leading to the bachelor of science (B.S.) degree in ventilation (inhalation) therapy. The master of science (M.S.) degree, offered by all departments; 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 sciences 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 (clinical) pharmacy practice. In addition, students have opportunities through the selection of professional electives to commence a specialization in one of several other areas of pharmacy, including hospital and clinical pharmacy, manufacturing pharmacy, 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. In preparation for this, students are encouraged to participate in externship or internship programs.

A quality point average of 2.000 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 17.

MEDICINAL CHEMISTRY FACULTY: Professor Bond, *chairman.* Professor Modest; Associate Professors Abushanab, Pringle, C. I. Smith and Turcotte.

PHARMACOGNOSY FACULTY: Professor Worthen, *chairman.* Professor Youngken; Associate Professor Shimizu; Assistant Professor Lyon; Clinical Professor Cannon.

PHARMACOLOGY AND TOXICOLOGY FACULTY: Professor DeFeo, *chairman.* Professor Lal; Associate Professors DeFanti, Fuller and Robinson; Assistant Professors Carlson, Karkalas, Miller, Swonger and Van Loon; Lecturer Yashar.

PHARMACY (pharmaceutics) FACULTY: Professor Ballard, *chairman.* Professors Osborne and Paruta;

Assistant Professors Cooper and Lausier; Clinical Professors Gallina and L. P. Jeffrey; Clinical Assistant Professor Fish; Clinical Instructors Elias, Kaufman, Pinkus and Solomon.

PHARMACY ADMINISTRATION FACULTY: Associate Professor Campbell, *chairman*. Associate Professors Crombe and Jacoff; Clinical Professor Uhl.

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 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 field study.

FIRST YEAR

First Semester

ENG 110 Composition	3
BIO 101 Biology of Plants or BIO 102 General Biology	3
CHM 101, 102 General Chemistry and Laboratory	4
*PEM 172 (or PEW 172) First Aid	1
Elective	3
	14

Second Semester

ENG 120 Literature and Composition or SPH 201 Interpersonal Communication	3
MTH 141 Introductory Calculus with Analytic Geometry	3
CHM 112, 114 General Chemistry and Laboratory	4
BIO 101 Biology of Plants or BIO 102 General Biology	3
*PEM 272 Advanced First Aid	1
Elective	3
	17

SECOND YEAR

First Semester

CHM 227, 226 Organic Chemistry and Laboratory	5
PHY 109 Introduction to Physics or PHY 111 General Physics or Equivalent physics course	4
ECN 123 Elements of Economics or ECN 125 Economic Principles	3
Elective	3
	15

Second Semester

CHM 228 Organic Chemistry	3
ACC 305 Accounting Principles or CSC 201 Introduction to Computing	3
MIC 201 General Microbiology	4
Electives	6
	16

THIRD YEAR

First Semester

PHC 333 General Pharmacy	4
BCH 311 Introductory Biochemistry	3
PAD 351 Pharmaceutical Law and Ethics	3
ZOO 242, 244 Introductory Human Physiology and Laboratory	4
Elective	3
	17

Second Semester

PCL 338 Pharmacology and Biopharmaceutics	4
PAD 451 Pharmacy Administration Principles	3
APA 401 Introductory Pathology	3
MCH 342 Pharmaceutical Analysis	3
Elective	3
	16

FOURTH YEAR

First Semester

PCL 441, 443 General Pharmacology and Laboratory	4
PCG 445, 447 General Pharmacognosy and Laboratory	4
MCH 443 Organic Medicinal Chemistry	3
PHC 353 Physical Pharmacy	3
Elective	3
	17

Second Semester

PCL 442, 444 General Pharmacology and Laboratory	4

* May be taken in second year.

PCG 446 General Pharmacognosy	3
MCH 444 Organic Medicinal Chemistry	3
PHC 344 Dose Forms	4
Elective	3
	17

FIFTH YEAR

First Semester

PAD 461 Clinical Seminar	1
PHC 451 Clinical Pharmacy or PCG 459 Public Health	3
PCL 453 Clinical Pharmacology and Toxicology	3
PHC 383 Pharmacy Practicum	3
Electives	6
	16

Second Semester

PAD 462 Clinical Seminar	1
PCG 459 Public Health or PHC 451 Clinical Pharmacy	3
PHC 384 Pharmacy Practicum	3
Electives	9
	16

Total credits required: 161

VENTILATION THERAPY

The four-year program in ventilation (inhalation) therapy prepares students for an allied health specialty related to the management of respiratory disease. The ventilation 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.

DIRECTOR: Clinical Instructor Gagliardi.

CURRICULUM REQUIREMENTS*

During the first three years on campus, the emphasis is on general education requirements, described on page 9, and basic courses in biology, mathematics, chemistry, pharmacology, and physics as necessary background for this allied health profession. Upon completion of these academic courses, the senior year provides a 52-week course in an approved hospital where didactic and labora-

* This curriculum has undergone revision. Students should consult with the dean's office for details regarding registration for the new curriculum.

tory instruction in a clinical setting is given. After successfully completing the course, the student is eligible for the national examination given by the American Registry of Inhalation Therapists.

Although the three-year University curriculum meets the requirements for application to hospital programs, the hospital staff reserves the right to select applicants for admission to the clinical year in the hospital. Therefore, selection to a hospital program can not always be assured at the completion of the third year on campus.

FRESHMAN YEAR

First Semester

ENG 110 Composition	3
MTH 109 Algebra and Trigonometry or MTH 141 Introductory Calculus with Analytic Geometry	3
ZOO 111 General Zoology	4
CHM 101, 102 or 103, 105 General Chemistry	4
Elective	1-3
Physical education	1
	16-18

Second Semester

ENG 120 Literature and Composition	3
MTH 141 Introductory Calculus with Analytic Geometry or MTH 142 Intermediate Calculus with Analytic Geometry	3
CHM 112, 114 General Chemistry	4
Electives	4-6
Physical education	1
	15-17

SOPHOMORE YEAR

First Semester

PHY 111 General Physics	4
ZOO 121 Human Anatomy	4
History elective	3
CHM 124 Organic Chemistry	3
Physical education	1
	15

Second Semester

PHY 112 General Physics	4
History elective	3
ZOO 142 Introduction to Human Physiology	3
Electives	6
Physical education	1
	17

JUNIOR YEAR

First Semester

PHC 225 Pharmaceutical Calculations and Introduction to Pharmacology	2
BCH 311 Introductory Biochemistry	3
ELE 215 Electrical Measurements or equivalent elective	2
PSY 103 Toward Self Understanding or PSY 113 General Psychology	3
Electives	6
	16

Second Semester

MIC 201 General Microbiology	4
PCL 226 Pharmacology and Therapeutics	3
Electives	9
	16

SENIOR YEAR

The hospital clinical program provides 36 credits.

Total credits required: 131-135

College of Resource Development

GERALD A. DONOVAN, *Dean*
ALBERT L. OWENS, *Director Resident Instruction*

The College of Resource Development provides four-year programs in animal science, plant science, natural resources, food science and technology, and agricultural and resource technology, leading to the bachelor of science (B.S.) degree. It also offers a two-year program in commercial fisheries leading to the associate in science (A.S.) degree. These curriculums are administered by the Director of Resident Instruction working directly with the teaching faculty in the departments.

The activities of the Resource Development faculty differ from those of the other colleges in that most appointments carry joint responsibility for the formal research programs of the Agricultural Experiment Station and Sea Grant, and/or the work of the Cooperative Extension Service, in addition to the graduate and undergraduate teaching.

The departmental organization of the faculty reflects the discipline orientation of the research programs. Graduate programs leading to the master of science (M.S.) degree are offered by most departments and some programs lead to the doctor of philosophy (Ph.D.) degree. The master of community planning (M.C.P.) degree is offered by the Department of Community Planning and Area Development. These are described in the *Graduate School Bulletin*.

ANIMAL PATHOLOGY FACULTY: Professor V. J. Yates, *chairman*. Professor Chang, Assistant Professors Kimball and Wolke; Adjunct Professors Dardiri and Liu.

ANIMAL SCIENCE FACULTY: Professor L. T. Smith, *chairman*. Professor Cobble; Associate Professors Cosgrove, Durfee, Henderson, Hinkson, Meade and Rand; Assistant Professors Gray and Millar; Instructor Nippo; Adjunct Professor Coduri.

COMMUNITY PLANNING AND AREA DEVELOPMENT FACULTY: Associate Professor Hammerschlag, *acting chairman*. Professor Jeffrey; Associate Professors Downe, Foster and Kumekawa; Assistant Professors Barber, Brooks and Mahayni; Instructor Johnson; Adjunct Professors Iatridis and Thomas.

FISHERIES AND MARINE TECHNOLOGY FACULTY: Associate Professor J. C. Sainsbury, *chairman*. Associate Professor Meade; Assistant Professors Hillier, McCauley, Merriam and Motte; Instructor Stout.

FOOD AND RESOURCE CHEMISTRY FACULTY: Professor Felbeck, *chairman*. Professors Chichester, Olney, Salomon and Simpson; Associate Professor Rand; Assistant Professor Gilbert; Adjunct Associate Professor Zaroogian.

FOREST AND WILDLIFE MANAGEMENT FACULTY: Associate Professor W. P. Gould, *chairman*. Professor Patric; Associate Professors Brown and Kupa; Assistant Professor Golet.

PLANT PATHOLOGY-ENTOMOLOGY FACULTY: Professor R. W. Traxler, *chairman*. Professors Beckman and Kerr; Associate Professors Jackson and

Mueller; Assistant Professors Englander and Field; Adjunct Professors Kaplan and Tarzwell.

PLANT AND SOIL SCIENCE FACULTY: Professor W. E. Larmie, *chairman*. Professors Roberts, Shutak, Skogley, Stuckey and Wakefield; Associate Professors Griffiths, Hindle, Hull, McGuire, Sheehan and Wilson; Assistant Professors Duff, McKiel, Shaw and Wright.

RESOURCE ECONOMICS FACULTY: Professor Cummings, *chairman*. Professors Dirlam, Holmsen, Lampe, Norton, Owens, Rorholm and Spaulding; Associate Professor Wallace; Assistant Professors Gates, Grigalunas, McConnell, McFarland, Seay and Weaver; Instructor Hueth.

TEACHER EDUCATION FACULTY: Associate Professor Shontz; Assistant Professor McCreight.

The four-year curriculums are designed to permit students to achieve two basic educational goals. The core requirements insure a basic exposure to the natural sciences, mathematics, social sciences, humanities and communication skills. From this broad base, students, in conjunction with their faculty advisers, develop areas of concentration that meet their individual needs and interests. The concentrations are supported by a block of directed electives. All programs contain a block of free electives for students to use as they choose.

With the exception of the structured programs in food science and commercial fisheries, the curriculum organization reflects a deliberate effort to accommodate students that differ greatly in the development of their career goals. Those with precise professional objectives are able to shape their programs to meet their particular needs. Many others are concerned with discovering their real aptitudes and interests, and use their undergraduate programs for this purpose. Specialized training required for competence in the areas chosen comes from the employer or from additional course work at the undergraduate or graduate level.

The flexibility that appears in the organization of the following curriculums is also intended to force each student to be involved in the direction and development of his program. The student and his adviser are responsible for the selection of courses that are applied to the area of concentration and the directed electives. By meeting the requirements of the curriculum, students will have also met the general education requirements of the University (see page 9).

PRE-PROFESSIONAL TRAINING

Students intending to transfer to a college of veterinary medicine can meet the admission requirements of most of these colleges after two years in the Animal Science curriculum if they have accepted proper advisement.

Resident students who may wish to follow professional programs in agricultural engineering, dairy technology, entomology, environmental design, fisheries biology, forestry, park management, or wildlife management should investigate the opportunities offered under the New England Regional Student Program (NEBHE). See page 17.

TEACHER EDUCATION

Students in any of the following B.S. curriculums will be eligible for teacher certification in Agri-Business and Natural Resources by including the following 36 credits as a part of their directed and free electives: EDC 102 or 103, PSY 113, EDC 312 or 313, EDC 444, EDC 484 (9-12 credits), RDV 486 (0-3 credits), EDC 485, and 9 credits in related mechanics courses.

NATURAL RESOURCES

Society's growing concern for our continuing ability to maintain our way of life in a satisfactory environment means that increasing emphasis will be given to solving the complex problems arising from man's use or misuse of the nation's natural resources. The search for solutions offers challenging careers for more and more people trained as resource scientists and technologists.

BASIC CORE, 66-71 credits

Required Courses (6): RDV 100, 101 and 300.

Biological Sciences (9-11): one course each in animal biology, plant biology, and ecology.

Physical Sciences (18): one course each in general chemistry, organic chemistry, physics, earth science, and soils.

Mathematics (3-6): it is desirable that all students secure a mathematics background that includes an introduction to calculus. For those not intending to pursue a graduate program, the need to reach that level may not be as critical.

Social Sciences (12-15): one course each in resource economics, political science, sociology, plus courses that apply in Division C of the general education requirements.

Humanities (9-12): courses that apply in Division A of the general education requirements.

Communications (6): one course in writing and one in speech. These may be applied in Division D of the general education requirements.

MAJOR AREA OF CONCENTRATION, 24 credits

Course selections to develop an area of specialization are made by the student in conference with his adviser. These require approval by the academic dean.

Resource Management and Conservation. Selection is made from among the advanced undergraduate courses directly related to the student's career goals offered by the basic and applied natural science departments.

Resource Economics. Selection is made from among the advanced undergraduate courses offered by the Departments of Resource Economics and Economics.

Marine Resources. Selection is made from among the advanced undergraduate, marine directed and related courses offered in departments such as Fisheries and Marine Technology, Oceanography, Ocean Engineering, and Geography.

DIRECTED ELECTIVES, 17-22 credits

FREE ELECTIVES, 18 credits

Total credits required: 130

ANIMAL SCIENCE

The modern livestock industry is a continuing source of employment for scientists with a strong, balanced training in the basic and applied animal and related sciences. Students with an interest in fields such as animal nutrition, physiology, or pathology, or in veterinary medicine or graduate study use this curriculum to build their programs.

BASIC CORE, 72-74 credits

Introductory Courses (4): ASC 101 and 102.

Biological Sciences (16-18): one course each in animal biology, animal physiology, genetics, general microbiology and plant biology.

Physical Sciences (16): two courses in general chemistry and one in organic chemistry, one course in physics.

Mathematics and Statistics (9): one course in algebra and trigonometry and one in introductory calculus, one course in statistics.

Social Sciences (9-12): courses that apply in Division C of the general education requirements.

Humanities (9-12): courses that apply in Division A of the general education requirements.

Communications (6): one course in writing and one in speech. These may be applied in Division D of the general education requirements.

MAJOR AREA OF CONCENTRATION, 24 credits

Advanced undergraduate courses to provide specialization in the animal sciences. Course selections are made by the student in conference with his adviser who would normally be a faculty member from the Departments of Animal Science or Animal Pathology. These require approval by the academic dean.

DIRECTED ELECTIVES, 21 credits

FREE ELECTIVES, 11-13 credits

Total credits required: 130

PLANT SCIENCE

This curriculum provides a framework within which students can develop a strong background in the basic and applied plant and related sciences. Many students use the program to prepare themselves for graduate study in fields such as plant breeding, nutrition, physiology and pathology.

BASIC CORE, 75-76 credits

Introductory Courses (7): PLS 104, 105 and 212.

Biological Sciences (16-17): one course each in plant biology, genetics, plant physiology and general microbiology, one course in animal biology or ecology.

Physical Sciences (19): two courses in general chemistry and one in organic chemistry, one course in biochemistry or a second course in organic chemistry, one course in earth science or physics.

Mathematics and Statistics (6): one course in algebra and trigonometry, one course in statistics.

Social Sciences (9-12): courses that apply in Division C of the general education requirements.

Humanities (9-12): courses that apply in Division A of the general education requirements.

Communications (6): one course in writing and one in speaking. These may be applied in Division D of the general education requirements.

MAJOR AREA OF CONCENTRATION, 24 credits

Advanced undergraduate courses to provide specialization in the plant sciences. Course selections

are made by the student in conference with his adviser who would normally be a faculty member from the Departments of Plant and Soil Science or Plant Pathology-Entomology. These require approval of the academic dean.

DIRECTED ELECTIVES, 24 credits

FREE ELECTIVES, 6-7 credits

Total credits required: 130

FOOD SCIENCE AND TECHNOLOGY

This intercollege and interdepartmental program, that follows a course of study meeting the educational standards established by the Institute of Food Technologists, is described under Interdepartmental Study on page 10.

AGRICULTURAL AND RESOURCE TECHNOLOGY

This curriculum is designed for students who do not need the depth in basic sciences required elsewhere, but who want a more practical or technical orientation in their programs. Many students from this program move into positions demanding depth of technical knowledge and skills in a variety of fields related to agricultural resources.

BASIC CORE, 59 credits

Biological Sciences (9): one course each in animal biology, plant biology and genetics.

Physical Sciences (8): two courses in chemistry.

Mathematics (3): one course.

Social Sciences (9-12): courses that apply in Division C of the general education requirements.

Humanities (9-12): courses that apply in Division A of the general education requirements.

Communications (6): one course in writing and one in speaking. These may be applied in Division D of the general education requirements.

Resource Sciences (12): four introductory courses to be taken early in the program from animal science, food science, plant science, soil science and resource economics.

MAJOR AREA OF CONCENTRATION, 24 credits

Advanced undergraduate courses to provide specialization in agricultural and resource technology. Course selections are made by the student in conference with his adviser. These require approval by the academic dean.

DIRECTED ELECTIVES, 30 credits

FREE ELECTIVES, 17 credits

Total credits required: 130

URBAN AFFAIRS

The curriculum in Resource Development in the Urban Environment is part of the newly created, interdisciplinary Urban Affairs Program (see page 10). It is designed for students who wish to prepare for careers as urban extension agents or with social service and community service organizations and agencies, and seeks to provide students with an understanding of how human and natural resources pertain to urban affairs.

Students who wish to major in this curriculum should consult the appropriate member of the Urban Affairs Program Coordinating Committee (listed on page 242) for assistance in the formulation and approval of their curriculums.

BASIC CORE, 57 credits

Biological and Physical Sciences (15): one course each in animal biology, plant biology, earth science, chemistry, and a minimum of one additional course in these areas.

Mathematics (3): one course.

Social Sciences (9-12): courses that apply in Division C of the general education requirements.

Humanities (9-12): courses that apply in Division A of the general education requirements.

Communications (6): one course in writing and one in speaking. These may be applied in Division D of the general education requirements.

Resource Sciences (12): four courses from among the following: animal science, food science, plant science, soil science and resource economics.

MAJOR AREA OF CONCENTRATION, 24 credits

Advanced undergraduate courses to provide specialization in urban affairs. Course selections are to be made by the student in conference with his adviser. For each student, this concentration is to be related to his general and/or unique interest in resource development and the urban environment.

DIRECTED ELECTIVES, 30 credits

FREE ELECTIVES, 19 credits

Total credits required: 130

COMMERCIAL FISHERIES

This two-year program, leading to the associate in science degree, was designed in cooperation with commercial fishermen and federal and state agencies to provide a thorough training for students intending to enter any sphere of commercial fisheries or marine technology. The 71-credit curriculum provides fundamental knowledge of fishing; vessel operation, equipment, handling, and navigation; fishing methods and gear; fishery business, economics, marketing and legislation; fish and their behavior.

Work on board ship, in the net loft, seamanship and navigation laboratories, engineering laboratory, and marine electronics and vessel technology laboratories make up a good proportion of credit hours. Formal classes on the campus will provide a background in the social, biological and physical sciences, as well as the professional subjects of navigation, seamanship, fishing gear and methods, engineering, marine electronics and vessel technology. Laboratory work is conducted on board the training vessel and in the waterfront laboratories.

The program is approved by the New England Board of Higher Education as regional in nature, and students from other New England states will be admitted for the same fees as those resident in Rhode Island (see page 17).

FIRST YEAR

First Semester

ENG 113 Composition	3
FMT 013 Shipboard Work I	2
FMT 118 Introduction to Commercial Fisheries	4
MTH 109 Algebra and Trigonometry	3
PEM 172 First Aid	1
REN 135 Fisheries Economics	5
	18

Second Semester

FMT 014 Shipboard Work II	1
FMT 110 Marine Technology	5
FMT 121 Fishing Gear I	3
FMT 131 Seamanship	3
SPE 101 Fundamentals of Oral Communication	3
General education elective	3
	18

SECOND YEAR

First Semester

FMT 015 Shipboard Work III	1
FMT 235 Fisheries Meteorology	2
FMT 241 Marine Engineering Technology I	4
FMT 261 Marine Electronics	3
FMT 281 Navigation I	4
FMT 351 Fish Preservation	3
	17

Second Semester

FMT 222 Fishing Gear II	3
FMT 242 Marine Engineering Technology II	4
FMT 293 Fish Operations Practicum	1
FMT 371 Ship Technology	4
FMT 382 Navigation II	3
FMT 392 Fishing Operations	3
	18

Total credits required: 71

Courses of Instruction

All 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 pre-freshman 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 open to other advanced undergraduates and to graduate students with permission.

The 500-level courses, listed in this bulletin 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; 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.

Twice a year, at the time of registration for the next semester, a *Schedule Book* is issued by the registrar listing the specific courses to be offered for that semester with the time of meeting, location, and instructor assigned for the section.

ACCOUNTING (ACC)

ACTING CHAIRMAN: Assistant Professor Martin

201, 202 Elementary Accounting *I and II, 3 each*
ACC 201: Basic functions and principles of accounting. *ACC 202:* Partnerships, corporations, manufacturing accounts and specialized areas. *(Lec. 3)* Staff

301 Accounting for Business Teachers *I, 3*
Accounting principles involving assets, liabilities, and owner's equity with emphasis on teaching in high school. *(Lec. 3) Prerequisite: ACC 202. Not open to accounting majors.* Staff

305 Accounting Principles *I and II, 3*
Survey of basic accounting principles and procedures with emphasis on their application to industrial administration of business enterprises. *(Lec. 3) Open to non-business students only. Not open to students who have taken or are required to take ACC 201.* G. Lees

311, 312 Intermediate Accounting *I and II, 3 each*
ACC 311: Theoretical aspects of accounting principles are presented with special emphasis on current and fixed assets and the corporate structure. *ACC 312:* Continuation of the study of accounting theory as applied to selected topics including investments, liabilities, financial statements, application of funds, cash

flow and price-level impacts. *(Lec. 3) Prerequisite: ACC 202.* Staff

321 Cost Accounting *I, 3*
Cost systems including job order, process, and standard costs with emphasis on the managerial control of costs. *(Lec. 3) Prerequisite: ACC 202.* Staff

324 Industrial Accounting *II, 3*
Survey of job order, process and standard cost accounting principles and procedures as related to the administrative aspects of manufacturing enterprises. *(Lec. 3) Not open to accounting majors. Offered in spring of even calendar years. Prerequisite: ACC 202 or 305.* G. Lees

343 A General Survey of the Federal Income Tax *II, 3*
Survey course in taxation for students with little or no previous work in accounting or business administration. Emphasis is placed on those aspects of taxation which are helpful to the individual. *(Lec. 3) Not open to accounting majors.* Staff

347 Fund Accounting *I and II, 3*
Principles of fund accounting as applied to municipalities, educational institutions, hospitals, and other similar organizations, with particular emphasis upon municipal records and statements. *(Lec. 3) Prerequisite: ACC 312 or permission of department.* Staff

371, 372 Special Problems *I and II, 3 each*
Seminar in current accounting problems, the topics of which may vary from semester to semester. *(Lec. 3) Prerequisite: permission of department.* Staff

413 Contemporary Accounting Issues *I, 3*
Study and interpretation of financial data. Case studies of current accounting theory in selected annual corporate reports are utilized. *Prerequisite: ACC 312, or permission of instructor. Not for graduate program credit.* Staff

422 Advanced Cost Accounting *II, 3*
Extension of managerial cost accounting, budgeting and relationship of accounting to other quantitative fields. *(Lec. 3) Prerequisite: ACC 321.* Staff

431 Advanced Accounting *II, 3*
Accounting theory applicable to partnerships, installment sales, insurance, consignments, receiverships, estates and trusts, consolidated statements, and specialized accounting subjects. *(Lec. 3) Prerequisite: ACC 312.* Staff

443 Federal Tax Accounting *I, 3*
Federal laws, regulations, and other authorities affecting taxation of individuals. *(Lec. 3) Prerequisite: ACC 202.* Staff

444 (544) Topics in Federal Taxation *II, 3*
Special topics in areas of partnerships, corporations, trusts, and estates. *(Lec. 3) Prerequisite: ACC 443 and permission of department.* Staff

461 Auditing *II, 3*
Auditing standards, procedures, programs, working papers and internal control. *(Lec. 3) Prerequisite: ACC 312.* Staff

510 (910) Financial Accounting *I and II, 3*

513 Accounting Systems *I, 3*

535 Advanced Problems in Accounting *II, 3*

548 Accounting for Noncommercial Entities *II, 3*

ANIMAL PATHOLOGY (APA)

CHAIRMAN: Professor Yates

331 Anatomy and Physiology *I, 3*
Fundamentals of anatomy and physiology of domesticated animals. *(Lec. 3) Prerequisite: MIC 201, ZOO 111, junior standing. In alternate years, next offered 1974-75.* Kimball

332 Animal Diseases *II, 3*
Specific diseases of mammals. *(Lec. 3) Prerequisite: APA 331. In alternate years, next offered 1974-75.* Kimball

401 Introduction to Pathology *I or II, 3*
Principles of general pathology including the cellular changes, etiology and pathogenesis of inflammatory, metabolic and neo-plastic processes with an overview of systemic pathology emphasizing common diseases of major organ systems. *(Lec. 3) Prerequisite: MIC 201, ZOO 242, and/or equivalent; junior standing, or permission of instructor.* Wolke

422 Avian Diseases *II, 3*
Common avian diseases, their causes, methods of identification, prevention and control. *(Lec. 3) Prerequisite: MIC 201, ZOO 111, and/or equivalent, junior standing. In alternate years, next offered 1973-74.* Yates

461 Laboratory Animal Technology
See Animal Science 461.

501, 502 Seminar *I and II, 1 each*

534 Animal Virology *II, 3*

536 Virology Laboratory *II, 2*

538 Epidemiology of Viral and Rickettsial Diseases *II, 2*

591, 592 Special Projects *I and II, 1-3 each*

ANIMAL SCIENCE (ASC)

CHAIRMAN: Professor L. T. Smith

101 Introduction to Animal Science *I, 3*
Role of the animal industry in world and national economy; general considerations of inheritance, growth, physiology, nutrition and diseases of domestic animals and poultry; geographic distribution and marketing of animal products. *(Lec. 3)* Staff

102 Introduction to Animal Science Laboratory *I, 1*
Laboratory exercise to demonstrate the principles of the animal industries. *(Lab. 2) Prerequisite: ASC 101. May be taken concurrently with ASC 101.* Staff

212 Feeds and Feeding *I, 3*
Principles and practices of feeding farm animals, nutrient requirements of animals, physiology of digestion, indentification and comparative value of feeds, and calculation of rations for all classes of livestock. *(Lec. 2, Lab. 2)* Staff

222 Commercial Poultry Production *II, 3*
Commercial practices involved in hatchery management and in production of hatching and market eggs, broilers, capons, turkeys, ducks, geese and game birds. Laboratory designed to show practical application of management principles. *(Lec. 2, Lab. 2) Prerequisite: ASC 101 or permission of instructor. In alternate years, next offered 1974-75.* Durfee

223 Poultry and Poultry Products *I, 3*
Evaluation of modern high production egg and meat strains of fowl and selection for exhibition characters. Grading live and dressed poultry and eggs, poultry processing, and laws regulating processing and distribution of poultry products. *(Lec. 1, Lab. 4) In alternate years, next offered 1973-74.* Durfee

228 Dairy Cattle Selection *II, 3*
Study of breed type and principles of selection and judging of dairy animals. Relationship of type to other economic traits. Trips to breeding establishments. *(Lec. 2, Lab. 2)* Gray

252 The Pleasure Horse *I and II, 2*
Principles of light horse management and horsemanship, including appreciation and use. *(Lec. 1, Lab. 2) Open to all students interested in the pleasure horse.* Henderson

253 Livestock Science *I, 3*
Problems relating to the scientific production and management of beef cattle, sheep, and swine. *(Lec. 2, Lab. 2)* Henderson

321 Dairy Cattle Management *I, 3*
Care and management of dairy herd. Emphasis on practical aspects of milk production and selection of breeding stock. *(Lec. 2, Lab. 2) In alternate years, next offered 1973-74.* Gray

352 General Genetics *I, 3*
Fundamental concepts of inheritance and variation in plants, animals, bacteria and viruses. *(Lec. 3) Prerequisite: BOT 111, or BIO 101 or 102, or ZOO 111. Not open to students who have taken BOT 352.* Smith

354 Genetics Laboratory *I, 2*
Basic principles of heredity demonstrated with various organisms ranging from viruses and bacteria to higher plants and animals. *(Lab. 4) Prerequisite: ASC 352 or BOT 352 and permission of instructor. May be taken concurrently with ASC 352. Not open to students who have taken BOT 354.* Smith

378 (or FNS 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 and Food and Nutritional Science Staff

382 Poultry Business *II, 3*
Poultry and enterprises, methods of organization, financing, and business management, with particular emphasis on current developments within the industry affecting business decisions. *(Lec. 2, Lab. 2) Prerequisite: ASC 122, REN 105 or permission of instructor. In alternate years, next offered 1973-74.* Millar

401, 402 Animal Science Seminar *I and II, 1 each*
Preparation and presentation of papers on recent scientific developments and selected subjects in animal and poultry science and food science. *(Lec. 1) Prerequisite: senior standing.* 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) Prerequisite: ASC 212, organic chemistry, junior standing.* Henderson

414 Advanced Ration Formulation *II, 3*
Ration formulation for livestock and poultry, use of ingredient composition tables, nutrient requirement handbooks, current literature, electronic computer techniques, and industry practices. *(Lec. 1, Lab. 4) Prerequisite: ASC 111. In alternate years, next offered 1973-74.* Ousterhout

415 Physiology of Lactation *I, 3*
Emphasis on endocrine control, milk precursors, general physiology of milk production and gross anatomy of udder, including vascular, lymphatic and nervous systems in dairy cattle. *(Lec. 3) Prerequisite: junior standing. In alternate years, next offered 1974-75.* Hinkson

432 Biology of the Fowl *II, 3*
Anatomy and physiology of the developing and adult domestic fowl emphasizing character of greatest economic interest, embryology, meat and egg production. Physiological responses to environmental conditions imposed in commercial production practices and their influences on productive performance. *(Lec. 2, Lab. 2) Prerequisite: ZOO 111 or BIO 102, CHM 221 or equivalent, junior standing. In alternate years, next offered 1973-74.* Durfee

441 Food Analysis *I, 3*
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) Prerequisite: organic chemistry.* Rand

442 Animal Breeding *II, 3*
Consideration of the inheritance of economic and morphological characteristics of domestic animals and poultry. Emphasis on development of criteria for selection and development of genetically sound breeding programs. *(Lec. 3) Prerequisite: ASC 352. In alternate years, next offered 1974-75.* Gray

444 Food Quality *II, 3*
Technological problems dealing with procurement, manufacture, transportation, grading, packaging and storage of food products. Field trips required. *(Lec. 2, Lab. 2) Prerequisite: MIC 101 and CHM 201.* Cosgrove

461 (or APA 461) Laboratory Animal Technology *I, 3*
Selection, breeding, and management of laboratory animals. *(Lec. 2, Lab. 2) Prerequisite: ZOO 111 or BIO 102.* Henderson and Yates

470 Population Genetics *II, 3*
Genetic structure of breeds or other population. Effect of gene number, degrees of dominance, gene interaction, non-genetic factors. Conditions of equilibrium. Rates of change in population mean and variability. Inbreeding, outbreeding, assortative mating, mass selection, family selection, progeny testing, selection indices, comparison of various breeding plans in plant and animal breeding. *(Lec. 3) Prerequisite: ASC 352 or BOT 352 or equivalent. In alternate years, next offered 1974-75.* Smith

472 Physiology of Reproduction *II, 3*
Anatomical and physiological study of reproduction with emphasis on domestic farm animals and fowl. Endocrine aspect of reproduction. *(Lec. 2, Lab. 2) Prerequisite: ZOO 111 and permission of instructor. In alternate years, next offered 1973-74.* Gray

491, 492 Special Projects *I and II, 1-3 each*
Special work to meet individual needs of students in various fields of animal and poultry science, and food science. *(Lec. and/or Lab. according to nature of project) Prerequisite: permission of department.* Staff

512 Adanced Animal Nutrition *II, 3*

532 Experimental Design *II, 3*

591, 592 Research Problems *I and II, 3 each*

Note: for Biochemistry of Foods, see FRC 431, 432.

ANTHROPOLOGY (APG)

CHAIRMAN: Associate Professor Poggie (Sociology and Anthropology)

201 Human Origins *I or II, 3*
Survey of anthropological knowledge of the biocultural evolution of man. Current trends of human evolution. *(Lec. 3) Prerequisite: sophomore standing.* Senulis

202 World Prehistory *I or II, 3*
Comparative study of cultural development until the advent of the Iron Age. Emphasis on events from the Neolithic and the course of development of old and new world civilizations. *(Lec. 3) Prerequisite: sophomore standing.* Senulis

203 Cultural Anthropology *I and II, 3*
Introduction to concepts and methods of cultural anthropology and an application of these to contemporary preliterate and peasant societies. *(Lec. 3) Prerequisite: sophomore standing.* Staff

301 Topics in Physical Anthropology *I or II, 3*
Intensive study of the evolution of man and related species including modern human variation. Anthropometric determination of age, sex, and racial differences. Interpretations will emphasize genetic and ecological models. *(Lec. 3) Prerequisite: APG 201.* Senulis

303 New World Archeology *I, 3*
Survey of the culture history of the American Indians from the earliest times to the period of European discovery and colonization, using archeological evidence and methods. *(Lec. 3) Prerequisite: APG 202 or 203.* Senulis

305 Peoples of the Far East *I or II, 3*
Survey of anthropological knowledge of peoples of the Far East from Southeast Asia through Japan and Asiatic Russia. Tribal and folk cultures analyzed as aid to understanding cultural configurations in the region. *(Lec. 3) Prerequisite: APG 203.* Gutherie

309 Religions of Non-literate Peoples *I or II, 3*
Religious systems of select non-literate peoples over the world; examination of theories concerning the origins, functions, and nature of religion. *(Lec. 3) Prerequisite: APG 203.* Gutherie

311 Native North Americans *I or II, 3*
Ethnographic analysis of selected American Indian and Eskimo groups from before European contact until the present. An examination of modern reservation life and the continuing influence of the federal government on Indian life. *(Lec. 3) Prerequisite: APG 203.* Lynch

313 The Ethnology of Africa *I or II, 3*
Ethnological survey of the cultural development of Africa's peoples from prehistoric times to the present, with emphasis on the traditional cultures prior to foreign influences; impact of European cultures. *(Lec. 3) Prerequisite: APG 203.* Pollnac

315 Cultures and Societies of Latin America *I or II, 3*
Contemporary cultures and societies in Latin Amer-

ica, with emphasis on the adjustment of the people to modern social and economic changes. *(Lec. 3) Prerequisite: APG 203.* Poggie

317 Archeology *II, 3*
Theory and method of archeology, stressing the problems of classification, dating and interpretation of archeological materials. Laboratory exercises and field work will be integral parts of the course. *(Lec. 3, Lab. 2) Prerequisite: APG 201 or 203 and permission of department.* Senulis

319 Cultural Behavior and the Environment *I or II, 3*
A survey and analysis of the variety of cultural adaptations made by traditional and industrial societies to the surrounding physical environment; the inter-relations between cultural creations, including technologies and belief systems, and the limits and possibilities of the environment. *(Lec. 3) Prerequisite: APG 201 or 203.* Lynch

321 Social Anthropology *II, 3*
Social structure and organization in the full range of types of human societies. The structural-functional approach in anthropology. *(Lec. 3) Prerequisite: APG 203.* Staff

322 Anthropology of Modernization *II, 3*
Examination of the patterns and processes of contemporary social and cultural change among traditional people. *(Lec. 3) Prerequisite: APG 203.* Poggie

323 Politics in Small-scale Societies *I or II, 3*
Anthropological approach stresses ethnographic field research. Both a cross-cultural perspective and inductive theory construction are used to examine political behavior among tribal and peasant peoples around the world. *(Lec. 3) Prerequisite: APG 203.* Lynch

324 Peasant Societies *II, 3*
Examination of the evolutionary development and sociocultural characteristics of the world's peasantry. Case studies of adaptations of peasants to a variety of ecological settings. *(Lec. 3) Prerequisite: APG 203. In alternate years, next offered 1973-74.* Poggie

325 Language and Culture *I or II, 3*
A cross-cultural survey of the interaction of culture and language. Introduction to the various fields of linguistic research emphasizing descriptive and semantic investigations. Selected linguistic studies used as illustrative material. *(Lec. 3) Prerequisite: APG 203.* Pollnac

401 History of Anthropological Theory *I or II, 3*
Anthropological theory from the sixteenth century to the present; readings from such writers as Tylor, Morgan, Boas, Sapir, Kroeber, Benedict, Malinowski and Radcliffe-Brown. *(Lec. 3) Prerequisite: APG 203 and two 300-level courses in anthropology or permission of department. In alternate years, next offered in 1974-75.* Staff

402 Methods of Anthropological Inquiry *I or II, 3*
The logic, techniques, and problems associated with obtaining true information in anthropological inquiry. Problems associated with anthropological field work and use of crosscultural data. *(Lec. 3) Prerequisite: APG 203 and two 300-level courses in anthropology or permission of department. In alternate years, next offered in 1973-74.* Staff

405 (506) Psychological Anthropology *I or II, 3*
Examination of behavior in different cultures employing psychological concepts and theories. *(Lec. 3) Prerequisite: APG 203 and 6 credits of 300-level courses in anthropology or permission of department.* Staff

407 Economic Anthropology *I or II, 3*
Introduction to theoretical concepts and methodologies used in the analysis of tribal and peasant economies, with emphasis on examination of case studies from the anthropological literature. *(Lec. 3) Prerequisite: APG 203.* Staff

470 Problems in Anthropology *I and II, 3*
Staff-guided study and research offered as a seminar or individual program. *(Lec. 3 or Lab. 6) Prerequisite: permission of department.* Staff

ART (ART)

CHAIRMAN: Professor Fraenkel

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

103 Three-dimensional Studio *I and II, 3*
Introductory studies emphasizing problems in three-dimensional organization and figure modeling in clay or plaster, observations from the live model with discussion and application of various molds and casting techniques. *(Studio 6) Prerequisite: ART 101 or permission of instructor.* Staff

120 Introduction to Art *I and II, 3*
Basic course designed to foster and develop an understanding of the fundamental principles of the visual arts, the evolution of styles and conceptions through the ages in different forms of creative expression. *(Lec. 3) May not be taken after ART 251, 252 for credit.* Staff

203 Color *II, 3*
The visual perception of color and the manipulation of light as they pertain to two- or three-dimensional formulations. *(Studio 6) Prerequisite: ART 101 and 103 or permission of instructor.* Leete

207 Drawing I *I and II, 3*
Basic studies in visual perception and observation, using nature structures, drawing from live models, still life and landscape, exercises in basic drawing

techniques and principles. *(Studio 6) Prerequisite: ART 103 or permission of department.* Staff

208 Drawing II *I and II, 3*
Advanced studio practice in graphic conceptions; exercises in spatial problems, organizing relationships of abstract forms and structures; advanced studies of drawing media. *(Studio 6) Prerequisite: ART 103 and 207 or permission of department.* Staff

213 Cinegraphics I *I and II, 3*
Introduction to photography and an exploration of related techniques using light sensitive materials. *(Lec. 3) Prerequisite: art majors who have completed ART 101 and ART 103 or permission of instructor.* Parker

221 Two-dimensional Studio II *I and II, 3*
Studio practice in the techniques of painting, utilizing as reference the natural and man-made environments. Both traditional and contemporary materials will be used. *(Studio 6) Prerequisite: ART 103.* Staff

231 Printmaking I *I and II, 3*
Introduction to relief, intaglio, lithographic and stencil printing mediums with consideration of processes in printmaking which have related application in painting, sculpture and photography. *(Studio 6) Prerequisite: ART 101 or permission of department.* Clapsaddle

233 Graphic Design I *I and II, 3*
Introduction to the basic elements of graphic design, a study of letter forms, their relationship to the page and to the image. Exploration of various traditional and modern reproduction techniques, workshop practice in type setting and layout. *(Studio 6) Prerequisite: ART 101 or permission of department.* Richman

243 Three-dimensional Studio II *I and II, 3*
Formation of three-dimensional forms employing basic sculptural materials and techniques. Exploration of the basic media with emphasis on form, material and structural means in studio practice. *(Studio 6) Prerequisite: ART 103 or permission of instructor.* Staff

251, 252 Introduction to History of Art *I and II, 3 each*
ART 251: Survey of the stylistic development of architecture, sculpture and painting from prehistory through the Middle Ages. *(Lec. 3) Prerequisite: sophomore standing. ART 252:* Continuation from the early Renaissance to the present. *(Lec. 3)* Staff

260 Short History of Architecture *II, 3*
Building styles on a roughly chronological basis emphasizing structure as an outgrowth of climate, materials and technology. *(Lec. 3) In alternate years, next offered 1974-75.* Staff

263 American Art *I, 3*
Painting, sculpture and architecture from their origins in the seventeenth century to the present, with special emphasis on the nineteenth and twentieth centuries. *(Lec. 3)* Staff

264 History of Decorative Arts *I, 3*
Pottery, textiles, silver and furniture as universal arts, and as seen by consumers. *(Lec. 3) In alternate years, next offered 1973-74.* Staff

265, 266 History of Asian Art *I and II, 3 each*
ART 265: Survey of the art of India, China, Japan, Persia and neighboring centers of Asian culture. *(Lec. 2) ART 266:* Continuation. *(Lec. 3)* Killen

272 Pre-Columbian Art *II, 3*
Introduction to the art of Mexico, Peru, Yucatan, Central America, and the Caribbean, tracing the development of art in middle America from the second millennium to the Spanish Conquest. *(Lec. 3) In alternate years, next offered 1974-75.* Killen

273 African Art *I, 3*
Introduction to the art of the Western Congo, Lower Congo, Bushongo, Eastern Congo, Gabon, Southern Nigeria, the Sudan, Guinea Coast, Nigeria, Benin, Ife, and the Cameroons. *(Lec. 3) In alternate years, next offered 1974-75.* Killen

309 Drawing III *I, 3*
Further problems in drawing with emphasis on independent investigation in the areas of analysis, planning, and supportive notation. *(Studio 6) Prerequisite: ART 208 or permission of instructor.* Staff

310 Drawing IV *II, 3*
Continuation of ART 309. *(Studio 6) Prerequisite: ART 309.* Klenk

314 Cinegraphics II *I and II, 3*
Continuation of ART 213. *(Lec. 3) Prerequisite: ART 213.* Parker

322 Two-dimensional Studio III *I and II, 3*
Continuation of ART 221. *(Studio 6) Prerequisite: ART 221.* Staff

332 Printmaking II *I and II, 3*
Continuation of ART 231 or 233 with experience in more complex printmaking techniques and processes. Special emphasis given to color and photo-printmaking techniques. *(Studio 6) Prerequisite: ART 231 or 233.* Clapsaddle

334 Graphic Design II *I and II, 3*
Continuation of ART 233. Applications of previous studies in graphic design to experimental workshop assignments leading to the production of book pages, folders, posters and other visual material incorporating type and print in a contemporary idiom. *(Studio 6) Prerequisite: ART 233 or permission of department.* Richman

337 Printmaking III *I and II, 3*
Advanced projects in printmaking demanding a broad

range of technical experience in the various graphic mediums. *(Studio 6) Prerequisite: ART 332.* Clapsaddle

338 Printmaking IV *I and II, 3*
Continuation of ART 337 with the option of self-direction in specific graphic mediums selected by the student. *(Studio 6) Prerequisite: ART 337.* Clapsaddle

344 Three-dimensional Studio III *I and II, 3*
Continuation of ART 243. *(Studio 6) Prequisite: ART 243 or permission of instructor.* Staff

352 Photography and Art in the Nineteenth Century *I, 3*
Intensive exploration of the interactions of photography and painting during the nineteenth century. *(Lec. 3) Prerequisite: ART 252 or permission of department. In alternate years, next offered 1973-74.* Lindquist-Cock

353 Art of Egypt and Mesopotamia *I, 3*
Art from 3000 B.C. to Alexander the Great in Egypt and the empires of the Near East. Consideration of archeological work and art historical interpretation. *(Lec. 3) Prerequisite: ART 251 or permission of department.* Staff

354 The Art of Greece and Rome *II, 3*
Developments in architecture, painting and sculpture in Greece and Rome from 800 B.C. to 400 A.D. This will include a brief analysis of the art of the Aegean from 2500 to 1500 B.C. *(Lec. 3) Prerequisite: ART 251 or permission of department.* Staff

355 Early Christian and Byzantine Art *I, 3*
Transformation of the late antique into Judaeo-Christian art, with emphasis on painting and mosaic. Sculpture and architecture will be discussed. Use of pagan styles and motifs in Jewish and Christian religious context. *(Lec. 3) Prerequisite: ART 251 or permission of department. In alternate years, next offered 1973-74.* Staff

356 Medieval Art *II, 3*
Development of medieval art from the Carolingian Renaissance through the end of the Gothic period (800-1400 A.D.), including an appraisal of painting, sculpture, architecture and the minor arts. *(Lec. 3) Prerequisite: ART 251 or permission of department.* Staff

357 Italian Renaissance *I, 3*
Painting, sculpture and architecture from the fourteenth century to the end of the sixteenth century. *(Lec. 3) Prerequisite: ART 251 or permission of department.* Staff

358 Northern Renaissance Art *I, 3*
Developments in French, Flemish and German art of the fifteenth and sixteenth centuries. *(Lec. 3) Prerequisite: ART 252 or permission of department. In alternate years, next offered 1973-74.* Staff

359 Baroque Art *II, 3*
Study of the transitional phases of mannerism to the seventeenth century Baroque synthesis in Italy and Northern Europe, and the international Rococo style. *(Lec. 3) Prerequisite: ART 251 and 252 or permission of department.* Staff

361, 362 Modern Art *I and II, 3 each*
Survey of main developments in painting, sculpture and architecture in Europe and America during the nineteenth and twentieth centuries. *(Lec. 3) Prerequisite: ART 252 or permission of department.* Killen

375 Nineteenth Century European Art outside France *I, 3*
Introduction to Scandinavian, German, Austrian, English, Netherlandish, and Italian painting and sculpture from the Nazarenes, Canova and Thorvaldsen through the Chelsea group, Klimt and Meunier. *(Lec. 3) Prerequisite: ART 252 or permission of department. In alternate years, next offered 1974-75.* Staff

376 Drawing and Drawings *II, 3*
The great draftsmen in the Western world from the fourteenth to the twentieth centuries. Emphasis will be put on the interaction of purpose, style, and drawing materials. *(Lec. 3) Prerequisite: ART 252 or permission of department. In alternate years, next offered 1973-74.* Staff

403 Studio—Seminar I *I and II, 3-6*
Problems in visual structures developed by the student in consultation with course instructors. Weekly critiques and discussions related to studio work and assigned topics. Intended for third-year art majors. *(Studio 6-12) Prerequisite: permission of department.* Staff

404 Studio—Seminar II *I and II, 3-6*
Continuation of ART 403. Intended for third-year art majors. *(Studio 6-12) Prerequisite: permission of department.* Staff

405 Studio—Seminar III *I and II, 3-6*
Intensive independent work conducted under the guidance of a project adviser selected by the student. Periodic critiques and discussions related to work of all participants in the course. Intended for fourth-year art majors. *(Studio 6-12) Prerequisite: permission of department.* Staff

406 Studio—Seminar IV *I and II, 3-6*
Continuation of ART 405. Intended for fourth-year art majors. *(Studio 6-12) Prerequisite: permission of department.* Staff

462 Modern Art Seminar: Art since 1945 *II, 3*
Reports on contemporary work and its relation to earlier movements. *(Lec. 3) Prerequisite: ART 262 or permission of department.* Staff

469, 470 Art History—Senior Projects *I and II, 3-6 each*
Intensive, independent work on a project to be deter-

mined after consultation with the student's project adviser. *(Lec. 3-6) Prerequisite: permission of department.* Staff

501 Graduate Studio—Seminar I *I and II, 3-12*

502 Graduate Studio—Seminar II *I and II, 3-12*

ASTRONOMY (AST)

CHAIRMAN: Professor Dietz (Physics)

108 Introductory Astronomy *I and II, 3*
Introductory course dealing with celestial sphere, earth as an astronomical body, sun, motions and characteristics of members of solar system, constellations, constitution of stars and nebulae. Planetarium will be used freely for lectures and demonstration. *(Lec. 3)* Penhallow

408 Introduction to Astrophysics *II, 3*
The application of photometry and spectroscopy to the study of stellar composition, structure, and evolution. Radio astronomy and the structure of our galaxy. Energy production in stars and galaxies. Observational cosmology. *(Lec. 3) Prerequisite: PHY 112 or 214. AST 108 is recommended but not required.* Penhallow

BIOCHEMISTRY (BCH)

CHAIRMAN: Professor Purvis

311 Introductory Biochemistry *I, 3*
Introduction to the chemistry of biological transformations in the cell. The chemistry of carbohydrates, fats, proteins, nucleic acids, enzymes, vitamins, hormones will be integrated into a general discussion of the energy yielding biosynthetic reaction in the cell. Designed as a terminal course in biochemistry. *(Lec. 3) Prerequisite: CHM 124 or equivalent.* Bell

400 Chemistry and Biochemistry of Carbohydrates *II, 3*
Advanced course in the chemistry of carbohydrates and their derivatives and their biological role. *(Lec. 3) Prerequisite: CHM 422 or BCH 582 or permission of department. In alternate years, next offered 1973-74.* Dain

411 Biochemistry Laboratory *II, 3*
Biochemical approach to biological research, guides the student through the study of a biological problem in metabolism at the level of enzymology. The effect of an alteration of the hormonal or nutritional status of an organism on enzyme-systems will be evaluated. Use of instruments and biochemical methods associated with each project. *(Lec. 1, Lab. 4) Prerequisite: BCH 311 or equivalent and permission of department.* Tremblay

531, 532, 533, 534 Seminar in Biochemistry *I and II, 1 each*

541, 542 Laboratory Techniques in Biochemistry *I and II, 3 each*

581, 582 General Biochemistry *I and II, 3 each*

BIOLOGY (BIO)

CHAIRMEN: Professor Goos (Botany) and Professor Chipman (Zoology)

101 Biology of Plants *I and II, 3*
Principles of biology sewed with an ecological thread to emphasize importance of plants on contemporary human life, thought, welfare and cultural history. Designed for non-majors. *(Lec. 2, Lab./Rec. 1)* Caroselli

102 General Biology *I and II, 3*
Important concepts and scientific methodologies are stressed in developing our understanding of the organic world and man's relationship to it; emphasizing animals, with special reference to man as an organism. *(Lec. 2, Lab. 2)* Heppner and Staff

Note: students who elect BIO 101 may not enroll in BOT 111, and those who elect BIO 102 may not enroll in ZOO 111.

BIOPHYSICS (BPH)

CHAIRMAN: Professor N. P. Wood (Microbiology and Biophysics)

302 The Molecular Basis of Life *II, 3*
The molecular basis of life as a key to the origin of life, evolution, expression of genetic information, and biological control. Designed for the non-biology major interested in gaining an overall view of biology at the molecular level. *(Lec. 3) Prerequisite: junior standing.* Fisher, Hartman, Cohen and Tremblay

401 Quantitative Cell Culture *I, 3*
Methods of mammalian cell culture used to examine the normal and abnormal cell in the study of cancer, genetic diseases, the radiation syndrome, nutrition and other problems. *(Lec. 3) Prerequisite: any two of following: BIO 101, 102, BOT 111, ZOO 111 or MIC 201; senior standing or above.* Fisher

491, 492 Research in Biophysics *I and II, 1-6 each*
Special problems in biophysics. Student required to outline his problem, carry on experimental work, and present his conclusions in a report. *(Lab. 2 to 12) Prerequisite: permission of instructor. Not for graduate credit.* Staff

521 Introductory Biophysics *I, 3*

522 Intermediate Biophysics *II, 3*

523, 524 Special Topics in Biophysics *I and II, 1-6 each*

526 Nuclear and Radiation Physics in Biology *II, 4*

595, 596 Seminar *I and II, 1 each*

BOTANY (BOT)

CHAIRMAN: Professor Goos

111 General Botany *I and II, 4*
Introductory course dealing primarily with study of 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 various groups of plant kingdom. *(Lec. 3, Lab. 2) Not open to students who have passed BIO 101.* Palmatier and Staff

216 Algae and Man *II, 2*
Importance of algae in the environment; their impact upon man and his technologies. *(Lec. 2) Prerequisite: BOT 111 or BIO 101.* Harlin

221 General Morphology *II, 3*
Representative forms of algae, fungi, bryophytes and vascular plants with emphasis on heredity, evolution, ecology, life cycle, and plant geography. *(Lec. 1, Lab. 4) Prerequisite: BOT 111 or BIO 101.* Hauke

245 Plant Physiology *I, 3*
Processes underlying the physiology of the whole plant. Emphasis on fundamental principles and interrelationships of plant functions in growth and development. *(Lec. 3) Prerequisite: BOT 111 or BIO 101, CHM 104 and 112.* Albert

262 Introductory Ecology
See Zoology 262.

315 Aquatic Plant Ecology *I, 2*
General marine and freshwater plant ecology. Considers habitats, environmental factors, vegetation types, community structure, periodicity, culture and bioassay, productivity, radioisotope use and mineral recycling. *(Lec. 2) Prerequisite: BOT 111 or BIO 101; ZOO 262 recommended. One all-day field trip.* Wood

323 Field Botany *I, 3*
Primarily a field course concerned with collection, identification and study of vascular plants with special emphasis on native flora of Rhode Island. Practice in use of manuals, interpretation of morphological characters, problems in nomenclature and herbarium technique. *(Lec. 1, Lab. 4) Prerequisite: BOT 111 or BIO 101.* Palmatier

332 Plant Pathology: Introduction to Plant Diseases *II, 3*
Covers wide range of plant diseases from standpoints of both host and taxonomy of fungi; the nature, cause and control of disease. As far as possible, types selected for study are taken from most common and serious plant diseases found in the state. *(Lec. 1, Lab. 4) Prerequisite: BOT 111 or BIO 101, or equivalent.* Caroselli

352 Genetics *II, 3*
Fundamental concepts of inheritance and variation in plants, animals, bacteria and viruses. Emphasis on methods of recombination, the process of mutation, gene structure and gene function. *(Lec. 3) Prerequisite: BOT 111, BIO 101 or 102, or ZOO 111; sophomore standing. Not open to students who have taken ASC 352.* Mottinger

354 Genetics Laboratory *II, 2*
Basic principles of heredity demonstrated with fungi, Drosophila and maize. *(Lab. 4) Prerequisite: BOT 352 or ASC 352 and permission of instructor. May be taken concurrently with BOT 352.* Mottinger

402 Systematic Botany *I, 3*
Diversity existing in vascular plants, its origin through evolution, and its organization into a hierarchy of categories. Orders and families of vascular plants. Methods of identification and analysis of variation. Brief consideration of rules of nomenclature and important systematic literature. *(Lec. 2, Lab. 3) Prerequisite: BOT 111 or BIO 101. In alternate years, next offered 1973-74.* Hauke

411 Plant Anatomy *I, 3*
Structure and development of tissues and organs in vascular plants with particular emphasis on ontogenetic approach. *(Lec. 1, Lab. 4) Prerequisite: BOT 111 or BIO 101 and junior standing or permission of department.* Hauke

417 Methods of Aquatic Plant Ecology *I, 3*
Field and laboratory work in marine and freshwater ecology. Designed to provide practical experience in aquatic biology. Provides the practicum for BOT 315. *(Lab. 6) Prerequisite: prior or concurrent enrollment in BOT 315 or equivalent.* Wood

418 Marine Botany *II, 3*
Field and laboratory study of marine algae with emphasis on classification and use of keys, and with consideration of their morphology, ecology and physiology. *(Lec. 2, Lab. 3) Prerequisite: BOT 111 or BIO 101 and junior standing. In alternate years, next offered 1973-74.* Wood

419 Freshwater Botany *II, 3*
Field and laboratory study of freshwater algae, and certain other plants, with emphasis on classification and use of keys, and with consideration of their morphology, ecology, and physiology. *(Lec. 2, Lab. 3) Prerequisite: BOT 111 or BIO 101 and junior standing. In alternate years, next offered 1974-75.* Wood

421 Advanced Practicum in Aquatic Plant Ecology *II, 3*
Experience in team research involving group selection of field project, preparation of proposal, design of experiment, investigation, and final report. *(Lab. 6) Pre-*

requisite: BOT 417 or equivalent. In alternate years, next offered 1973-74. Wood

424 Plant Ecology *II, 3*
Principles and problems concerning the composition of plant communities, methods of distinguishing and describing them, with a bearing on the landscape and man's role as an agent for change. Field trips, ecological techniques, literature, special projects and reports. One all-day field trip. *(Lec. 1, Lab. 4) Prerequisite: BOT 402 or 323.* Palmatier

432 Mycology: Introduction to the Fungi *I, 4*
Basic course in the identification, structure, cytology, development and distribution of fungi. Recognition of types important in organic decomposition, disease, medicine, industry, and as food. *(Lec. 2, Lab. 4) Prerequisite: BIO 101 or BOT 111; BOT 221 or 332 recommended.* Goos

445 (442) Advanced Plant Physiology *II, 3*
Covers major areas with emphasis on quantitative and metabolic aspects of plant processes and their relationships to growth. *(Lec. 2, Lab. 3) Prerequisite: CHM 124 or 227, BOT 245, or equivalent or permission of instructor.* Albert

453 Cytology *I, 3*
Structure and development of plant and animal cells with particular reference to nuclear and cell divisions, meiosis and fertilization. Special attention to bearing of cytology on taxonomy, physiological behavior and theories of heredity and evolution. *(Lec. 1, Lab. 4) Prerequisite: BOT 111, BIO 101, or ZOO 111, permission of department.* Hargraves

455 Marine Ecology
See Zoology 455.

457 Marine Ecology Laboratory
See Zoology 457.

491, 492 Special Problems *I and II, 1-3 each*
Selected areas of study pertinent to the needs of individuals or small groups. Instruction may be offered in class, seminar or tutorial situations. *(Lec. 1-3 or Lab. 2-6) Offered only to undergraduates on arrangement with staff.* Staff

511 Developmental Plant Anatomy *II, 3*

512 Morphology of Vascular Plants *II, 3*

524 Methods in Plant Ecology *I, 3*

526 (or GEG 526) Plant Geography *I, 3*

534 Physiology of the Fungi *I, 3*

536 Phytopathological Techniques *I, 3*

540 Experimental Mycology *II, 3*

542 Medical Mycology *II, 3*

554 Cytogenetics *I, 4*

559 Physiological Ecology of Marine Macroalgae *I, 4*

562 Seminar in Plant Ecology *II, 2*

579 Advanced Genetic Seminar *I and II, 1*

581, 582 Botany Seminar *I and II, 1 each*

591, 592 Botanical Problems *I and II, 3 each*

593, 594 Botanical Problems *I and II, 3 each*

BUSINESS EDUCATION (BED)

CHAIRMAN: Assistant Professor Langford

Note: BED 121, 122, 227, 321, 322, 325, 326, or 328 may be elected by students other than those majoring in office administration or business education.

120 Personal Typewriting *II, 1*
Development of basic skill in the operation of the typewriter. *(Lab. 3)* Staff

121 Elementary Typewriting *I, 2*
Development of basic skill in the operation of the typewriter, and an understanding of office procedures using the typewriter. Students are expected to attain a speed of 40 words a minute. *(Lab. 4)* Staff

122 Advanced Typewriting *II, 2*
Continuation of BED 121 with emphasis on business applications for typewriting. A speed of 55 words a minute is required by the end of the semester. *(Lab. 4) Prerequisite: BED 121 or equivalent.* Staff

227 Business Communications *II, 3*
Effective business communication with an interdisciplinary approach. Practice and discussion of the basic types of business messages, written and oral. Developing and presenting effective reports through the use of integrated case problems. *(Lec. 3) Prerequisite: permission of instructor.* Staff

321 Elementary Shorthand *I, 4*
Fundamental principles of Gregg shorthand, Diamond Jubilee Series. *(Rec. 4)* Staff

322 Advanced Shorthand *II, 4*
Continuation of BED 321. Development of speed and accuracy in taking dictation. A speed of 80 words a minute is required by the end of semester. *(Rec. 4) Prerequisite: BED 321 or equivalent.* Staff

323 Dictation and Transcription *I, 4*
Synchronization of the three elements of transcription: shorthand, typewriting, and English. *(Rec. 3, Lab. 5) Prerequisite: for other than business educa-*

tion and office administration majors, permission of instructor. Staff

324 Advanced Dictation and Transcription *II, 2*
Refinement of techniques in dictation and transcription to meet business standards. *(Rec. 1, Lab. 3) Prerequisite: for other than business education and office administration majors, permission of department.* Staff

325 Records Administration *I, 2*
Comprehensive study of the establishment and maintenance of business records, including an analysis of the various information processing/storage systems. *(Lab. 4)* Staff

326 Business Machines *I and II, 3*
Operation of business machines, their appropriate use in business and in the business departments of secondary schools. *(Lab. 6) Prerequisite: for other than business education and office administration majors, permission of department.* Staff

328 Office Procedures and Administration *II, 3*
Seminar in the administrative procedures of the business office. *(Lec. 3)* Staff

421 Directed Study *I and II, 3*
Independent study. Development of an approved project supervised by a member of the department faculty. *Prerequisite: junior standing, permission of department and instructor. Not for graduate degree program credit.* Staff

422 Special Problems *I and II, 3*
Lectures, seminars, and instruction with special emphasis on student research projects. *Prerequisite: junior standing, permission of department and instructor. Not for graduate degree program credit.* Staff

427 Organization, Administration and Methods of Teaching Distributive Education *I, 3*
Background, aims, coordination techniques and administrative policies for organizing and operating distributive education programs in secondary schools, post-secondary schools, and adult education programs. Planning and developing effective techniques in teaching distributive education. *(Lec. 3) Prerequisite: senior standing and permission of department. Not for graduate degree program credit.* Staff

428 Coordinating and Developing Curriculum for Cooperative Vocational Business and Distributive Education *I, 3*
Duties of the coordinator: selecting training agencies, developing job analysis, selecting and briefing the training supervisor, selecting and working with advisory committee, utilizing other community resources. Principles and problems in the construction of the high school and post-secondary school cooperative vocational and distributive education curriculums. *(Lec. 3) Prerequisite: senior standing and permission of department.* Staff

520 Research and Methods in Teaching Office Occupations Subjects *I, 3*

522 Improvement of Instruction in Social Business Subjects *II, 3*

524 Foundations and Recent Developments in Business Education *II, 3*

525 Research Seminar in Business Education *I, 3*

526 Field Study and Seminar in Business Education *I and II, 3*

BUSINESS LAW (BSL)

CHAIRMAN: Professor Coates (Organizational Management and Industrial Relations)

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) Prerequisite: junior standing. Open to non-business students only by permission of department.* Geffner, Peck, and Staff

334 Law in a Business Environment *II, 3*
The operation of the system of jurisprudence as it affects agency, business organizations and the sales of merchandise. *(Lec. 3) Prerequisite: BSL 333. Open to non-business students only by permission of department.* Geffner, Peck, and Staff

342 Property Interests *II, 3*
Creation and transfer of personal and real property interests. The legal protection and security of personal and real property interests is given broad consideration. *(Lec. 3) Prerequisite: BSL 333 and senior standing.* Geffner

500 (900) Legal Environment of Business *I and II, 2*

CHEMICAL ENGINEERING (CHE)

CHAIRMAN: Professor Treybal

211 Introduction to Chemical Engineering *I, 2*
Orientation in chemical engineering followed by an introduction to the use of computers and numerical methods. *(Lec. 1, Lab. 3) Prerequisite: credit or registration in MTH 142.* Votta

212 Chemical Process Calculations *I, 2*
Material balance computations on chemical processes, use of gas laws, vapor pressure, humidity, solubility and crystallization. *(Lec. 1, Lab. 3) Prerequisite: CHM 112 or 192 and registration in CHE 211.* Shilling

313 Chemical Engineering Thermodynamics *II, 3*
Applications of the first, second and third laws of thermodynamics involving thermophysics, thermo-

chemistry, energy balances, combustion and properties of fluids. *(Lec. 2, Lab. 3) Prerequisite: CHE 212 or CHM 441 and MTH 243.* Votta

314 Chemical Engineering Thermodynamics *I, 3*
Continuation of CHE 313 with applications to compression, refrigeration and chemical equilibrium. *(Lec. 2, Lab. 3) Prerequisite: CHE 313.* Votta

322 Chemical Process Analysis *I, 1*
Quantitative experimental studies of selected unit chemical processes. *(Lab. 3) Prerequisite: credit or registration in CHE 344.* Staff

328 Industrial Plants *I, 1*
Field trips to nearby plants demonstrating various phases of chemical engineering. Written reports are required. *(Lab. 3) Prerequisite: credit or registration in CHE 344.* Staff

332 Physical Metallurgy *I and II, 3*
Lectures and laboratory experiments teach the 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) Prerequisite: CHM 101, 103 or 191 and junior standing.* Mairs

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) Prerequisite: junior standing or permission of instructor.* Mairs

341 Thermodynamics and Transfer Rates *I, 4*
Principles and applications of the first and second laws of thermodynamics involving energy balances, properties of fluids, compression and power cycles. An introduction to heat and mass transfer. *(Lec. 4) Prerequisite: credit or registration in MCE 354.* Knickle or Votta

342 Introduction to Transport Phenomena *I, 4*
Theory and basic principles underlying the unit operations of chemical engineering: flow of fluids, flow of heat, evaporation, diffusion, humidification, and drying. Solution of problems based on actual operating data from industrial process equipment. *(Lec. 3, Lab. 3) Prerequisite: CHE 212.* Barnett

343 Mass Transfer Operations *II, 3*
Continuation of CHE 342 including distillation, gas absorption, extraction, crystallization. *(Lec. 2, Lab. 3) Prerequisite: CHE 344.* Knickle

344 Introduction to Transfer Rates *I and II, 3*
Introduction to fluid mechanics, heat transfer and mass diffusional processes. *(Lec. 3) Prerequisite: credit or registration in MCE 341 or CHE 314.* Madsen or Barnett

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) Prerequisite: CHE 343.* 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) Prerequisite: CHE 314 and 343.* Madsen

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. *Prerequisite: 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. Discussion of desalinization, mining, combating oil spills, seawater as a coolant, seawater as a waste diluent, food processing, sulfur and petroleum production and recovery minerals. *(Lec. 2, Lab. 3) Prerequisite: permission of instructor.* Barnett and Knickle

425 Process Dynamics and Control *II, 3*
Principles involved in the automatic control of processing plants. Modeling and responses of dynamic systems, feedback control. *(Lec. 3) Prerequisite: MTH 243 and ELE 211 or ELE 220 and credit or registration in CHE 341, 344 or MCE 354.* Shilling

437 Materials Engineering *I and II, 3*
Introduction to engineering aspects of the chemical and physical properties and fundamentals of the solid state. Structure and properties of engineering materials with emphasis on ceramics, polymeric and composite materials. *(Lec. 3) Prerequisite: CHM 101, 103 or 191 or permission of department.* Gielisse

464 Industrial Reaction Kinetics *I, 2*
Introduction to the design of chemical reactors. *(Lec. 2) Prerequisite: CHE 314.* Shilling

471 (571) 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 1973-74.* Votta

501, 502 Graduate Seminar *I and II, 1 each*

530 Polymer Chemistry *I, 3*

531 Polymer Engineering *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*

538 Nuclear Metallurgy *II, 3*

539 Electron and Light Microscopy of Solids *I, 3*

572 X-ray Diffraction and Fluorescence *I, 3*

573 Mechanical Metallurgy *I or II, 3*

574 Biochemical Engineering *I, 3*

581 Introduction to Nuclear Engineering *I and II, 3*

582 Radiological Health Physics *I, 3*

583 Nuclear Reactor Theory *II, 3*

585 Measurements in Nuclear Engineering *I, 3*

586 Nuclear Reactor Laboratory *II, 3*

591, 592 Special Problems *I and II, 1-6 each*

CHEMISTRY (CHM)

CHAIRMAN: Professor Goodman

101 General Chemistry Lecture I *I and II, 3*
Treatment of 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 CHM 103 or 191.* Cruickshank

102 Laboratory for Chemistry 101 *I and II, 1*
Experimental work illustrating certain concepts and principles now a part of general chemistry. Experiments in solution, reaction rates, enthalpy, molar heat capacity, and electro-chemistry. *(Lab. 3) Prerequisite: prior or concurrent registration in CHM 101.* Staff

103 Introductory Chemistry Lecture *I, 3*
A qualitative examination of the structure and properties of everyday materials using models of chemical bonding and molecular interactions. Elementary chemical calculations. *(Lec. 3) Not open to students who have received credit for CHM 101 or 191.* Hamlet

104 General Chemistry Lecture II *II, 3*
Continuation of CHM 101 or CHM 103 for students who plan no further training in chemistry and wish to complete a year's study in general chemistry. *(Lec. 3) Prerequisite: CHM 101 or 103.* Cruickshank

105 Laboratory for Chemistry 103 *I, 1*
Designed to fit the course content of CHM 103. *(Lab. 3) Prerequisite: prior or concurrent registration in CHM 103.* Staff

106 Laboratory for Chemistry 104 *II, 1*
Designed to fit the course content of CHM 104. *(Lab. 3) Prerequisite: prior or concurrent registration in CHM 104.* Staff

107 Chemistry of Our Environment *I and II, 3*
Elementary chemistry for non-science majors, emphasizing the chemical aspects of the human environment. Chemistry of the biosphere, chemistry of pollution and aspects of industrial chemistry. *(Lec. 3)* Staff

108 General Chemistry Laboratory *I and II, 1*
General principles of chemistry to accompany CHM 107 for those who want a laboratory as part of their chemistry course. *(Lab. 3) Prerequisite: prior or concurrent registration in CHM 107.* Staff

112 General Chemistry Lecture II *I and II, 3*
Elementary thermodynamics, chemical equilibria in aqueous solutions, properties and reactions of inorganic species, and practical applications of chemical principles. *(Lec. 3) Prerequisite: CHM 101 or 103. Not open to students who have passed CHM 104.* Staff

114 Laboratory for Chemistry 112 *I and II, 1*
Semi-micro-qualitative analysis and its applications. *(Lab. 3) Prerequisite: prior or concurrent enrollment in CHM 112. Not open to students who have passed CHM 106.* Staff

124 Organic Chemistry *II, 4*
Elementary principles of organic chemistry with emphasis on aliphatic compounds, including especially those of physiological significance such as amino acids and proteins, carbohydrates, fats and waxes. *(Lec. 3, Lab. 3) Prerequisite: CHM 101 or 103. Not open to students in chemistry or chemical engineering.* Staff

191 General Chemistry *I, 5*
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 CHM 101 or 103.* Staff

192 General Chemistry *II, 5*
Continuation of CHM 191. *(Lec. 4, Lab. 3)* Staff

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) Prerequisite: CHM 112 and 114.* Rosie and Fasching

226 Organic Chemistry Laboratory I and II *I and II, 2*
Laboratory combination of CHM 229 and 230 to be

completed in one semester. *(Lab. 6) Prerequisite: prior or concurrent registration in CHM 228. Not open to students who have passed CHM 229 or 230.* Staff

227 Organic Chemistry Lecture I *I and 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) Prerequisite: CHM 104 and 106 or 112 and 114 or 192.* Staff

228 Organic Chemistry Lecture II *II, 3*
Continuation of CHM 227 with emphasis on the aromatic series. *(Lec. 3) Prerequisite: CHM 227.* Staff

229 Organic Chemistry Laboratory I *I, 1*
Common techniques and typical preparative methods in aliphatic series. *(Lab. 3) Prerequisite: prior or concurrent registration in CHM 227.* Staff

230 Organic Chemistry Laboratory II *II, 1*
Continuation of CHM 229 with emphasis on the aromatic series. *(Lab. 3) Prerequisite: CHM 229 and prior or concurrent registration in CHM 228.* Staff

335, 336 Physical Chemistry Laboratory *I and II, 2 each*
Physical chemical properties of gases, liquids and solutions; electrochemical cells; phase diagrams of binary and ternary systems; and chemical kinetics are studied in the laboratory. Designed for chemistry majors. *(Lab. 4) Prerequisite: CHM 431 for CHM 335 and CHM 432 for CHM 336. May be taken concurrently with CHM 431, 432.* Kraus

353, 354, 355, 356 Undergraduate Research *I and II, 3 each*
Methods of approach to a research problem. Use of the literature, laboratory work, and a report on an original problem or problems. Seniors may elect maximum of 6 credits with permission of advisers and approval of research faculty concerned. Honors students may elect 12 credits. *(Lab. 9) Prerequisite: CHM 228, 432 and permission of department.* Staff

391 The Literature of Chemistry *I, 1*
Survey of publications in field including primary literature sources, abstracting serials, monographs, patents, government publications. Reports on assigned topics required. For seniors and graduate students in chemistry. *(Lec. 1) Prerequisite: prior or concurrent registration in CHM 228 or 432.* 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. Prerequisite: prior or concurrent registration in CHM 228 or 432.* Staff

401 Intermediate Inorganic Chemistry *I, 3*
Nucleus of the atom, isolated atom, chemical bond, magnetic effects in chemistry, complex ions, hydrides, rare-earths, inorganic polymers, inorganic reaction mechanisms, thermodynamics. *(Lec. 3) Prerequisite: CHM 432.* Nelson

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, voltammetric titration methods. *(Lec. 3) Prerequisite: CHM 228 and 432.* Rosie and Fasching

414 Instrumental Methods of Analysis Laboratory *II, 2*
Applications of the methods of analysis covered in CHM 412 to physical-chemical separations are studied in the laboratory. *(Lab. 6) Prerequisite: CHM 412. May be taken concurrently with CHM 412.* Rosie and Fasching

425 Qualitative Organic Analysis *I, 4*
Methods of identification of typical organic compounds. Consideration given to separation and identification of components of mixtures. Use of infrared and nuclear magnetic resonance spectra is emphasized. *(Lec. 2, Lab. 6) Prerequisite: CHM 228 and 226 or 230.* Staff

431, 432 Physical Chemistry *I and II, 3*
CHM 431: Gas laws, kinetic theory, laws of thermodynamics, chemical equilibrium, phase equilibria, and electrochemistry. *CHM 432:* Atomic theory, quantum chemistry, bonding, molecular interactions and chemical kinetics. *(Lec. 3) Prerequisite: CHM 112 or 192 and MTH 141. May be taken for graduate credit only by students whose disciplines do not require physical chemistry as part of their undergraduate programs.* Staff

501 Molecular Structure in Inorganic Chemistry *I or II, 3*

503 Chemistry of the Representative Elements *I, 3*

504 Physical Methods of Inorganic Chemistry *II, 3*

508 Inorganic Reaction Mechanisms *II, 3*

511 Chemical Spectroscopy *I, 3*

512 Advanced Instrumental Analysis *II, 3*

513 Advanced Analytical Laboratory *I, 3*

514 Thermal Methods of Analysis *II, 3*

516 Ion Exchange and Gas Chromatography *II, 3*

518 Radiochemistry *II, 3*

520 Radiochemistry Laboratory *II, 1*

521 (421) Advanced Organic Chemistry *I, 3*

522 Advanced Organic Chemistry *II, 3*

528 Organo-inorganic Chemistry *II, 3*

531 Chemical Kinetics *I, 3*

533 Elementary Chemical Thermodynamics *I, 3*

535 Chemical Applications of Group Theory *I, 2*

536 Molecular Spectroscopy and Structure *II, 3*

537 Quantum Chemistry I *I, 3*

544 (434) Applications of Chemical Data Processing *II, 3*

551, 552 (651, 654) Research *I and II, 3 each*

CHILD DEVELOPMENT AND FAMILY RELATIONS (CDF)

CHAIRMAN: Associate 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 Growth and Development of Children *I and II, 3*
Planned 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

270 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. *Students should have two free hours between 9 and 11:30 and 1 and 3:30 one day per week. (Lec. 2, Lab. 2) Prerequisite: CDF 200.* Nursery School Staff

290 Fundamentals of Preschool Education *I and II, 2*
Philosophy and theory basic to teaching and guiding the young child. This course is restricted to professional and semi-professional persons with experience in the field. *(Lec. 2) Prerequisite: permission of instructor.* Staff

302 Adolescent Growth and Development *I and II, 3*
Physical, psychological, social and emotional growth and development of individual during adolescent years. *(Lec. 3) Prerequisite: CDF 200 or PSY 232.* Staff

320 Human Relations Laboratory *I and II, 1*
Understanding individual behavior in the context of a social group; discussion and selected group dynamics techniques. *(Lab. 2) Open only to students concurrently enrolled in HMG 370. S/U credit.* Fitzelle

330 Curriculum for Young Children *I and II, 3*
Program planning for nursery school and kindergarten. Theory and teaching techniques that foster full development of the young child through language, arts, creative activities, science and mathematics. *(Lec. 3) Prerequisite: CDF 270.* Staff

331 Literature for Children *I and II, 3*
Consideration of the literary heritage of American children and criteria for the selection and presentation of literature to children. *(Lec. 3) Prerequisite: junior standing.* Staff

340 Family and Community Health *I and II, 3*
Health maintenance throughout life. Specific health concerns of various age groups. Study of community and world health needs and agencies concerned with meeting these needs. Homenursing demonstration and practice. *(Lec. 3) Prerequisite: junior standing.* Votta

355 Marriage and Family Relationships *I and II, 2-3*
Emphasis on relationships between men and women in courtship, engagement and first years of marriage. These are seen as influenced by development and functioning of the individuals' personalities which in turn are influenced by cultural factors. *(Lec. 2 or 3) Prerequisite: junior standing.* Staff

370 Nursery School Practicum *I and II, 4*
Supervised participation in the nursery school. Discussion and conferences. *(Lec. 2, Lab. 4) Prerequisite: prior or concurrent registration in CDF 330 and permission of department.* Nursery School Staff

375 Supervised Practice *I and II, 4-8*
One quarter of the senior year spent in full-time practice in an agency for children or families. Students work under properly qualified persons, supervised by the staff. Application for permission to take this course should be made by beginning of junior year. *(Lab. arranged) Prerequisite: permission of department. S/U credit.* Staff

390 Contemporary Philosophies of Guiding Children *I and II, 3*
Emphasis on factors involved in developing a philosophy of guidance of children and adolescents. The evolution of present-day theory. Contemporary writers are read and discussed. *(Lec. 3) Prerequisite: CDF 270 or permission of department.* Staff

400 Child Development: Advanced Course *I, 3*
Presentation of theory of human development and consideration of some of the classical and current investigations in the field. *(Lec. 3) Prerequisite: CDF 200 or equivalent.* Staff

403 Human Development During Adulthood *I or II, 2-3*
Major social and psychological factors influencing development after attainment of physiological maturity and prior to senescence. Study of family relationships and relevant aspects of the contributions of a number of theorists including the following: Erikson, Maslow,

Peck, Riesman and Selye. *(Lec. 2 or 3) Prerequisite: CDF 200, 302 or equivalent.* Staff

450 Family Interaction *I, 3*
Interdisciplinary approach to the dynamics of intra-family relationships, interactions of family units and family members with elements of the socio-cultural environment. *(Lec. 3) Prerequisite: SOC 202 or CDF 355.* Staff

460 Family Life Education *II, 3*
Interdisciplinary consideration of relationships between the sexes during childhood and adolescence, including the following topics of interest to school personnel: family health, normal psycho-sexual development, marriage, ethics, sex education, teaching of family relations. *(Lec. 3) Prerequisite: CDF 355 or permission of department.* Staff

480 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. 1) Prerequisite: permission of department.* Staff

497, 498 Special Problems *I and II, 2-4 each*
Open to qualified seniors or graduate students who wish to do advanced work. *(Lec. or Lab. according to nature of problem.) Prerequisite: senior standing and permission of department.* Staff

500 Child Development Seminar *I or II, 3*

550 Family Relations Seminar *II, 3*

570 Field Experience with Exceptional Children *I and II, 3*

595 (595, 596) Masters Project: Action Research *I and II, 1-6*

597, 598 Advanced Study *I and II, 3 each*

CIVIL AND ENVIRONMENTAL ENGINEERING (CVE)

CHAIRMAN: Associate Professor McEwen

216 Metronics *I, 3*
Applications of numerical analysis and computer programming to traverse, coordinate geometry, curves, and earth work computations. *(Lec. 2, Lab. 3) Prerequisite: MTH 141.* Gentile

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) Prerequisite: MCE 162.* Staff

301, 302, 303, 304, 305, 306 Introduction to Professional Practice in Civil Engineering *I and II, 0*
Discussion with faculty and visiting 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 sophomore, junior and senior years. S/U credit.* 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) Prerequisite: MTH 141.* Gentile

322, 323 Civil Engineering Laboratory I and II *I and II, 2 each*
Sequence of laboratory courses investigating the properties and behavior of engineering materials. Includes directed work in concrete, soils and bituminous materials and experimental stress analysis. Independent student projects. *(Lec. 1, Lab. 3) Prerequisite: CVE 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) Prerequisite: CVE 220.* Gentile

346 Transportation Engineering *II, 3*
Development, planning, location and design aspects of the major transportation systems. *(Lec. 3)* Moultrop

350 Structural Analysis I *I, 3*
Structural systems: beams, frames, arches, plates, shells. Analysis of determinate and indeterminate structures. Virtual work, conjugate beam, general method for indeterminate structures. *(Lec. 3) Prerequisite: CVE 220.* Staff

351 Structural Analysis II *II, 3*
Advanced topics in truss and frame analysis: energy methods, slope deflection, moment distribution, matrix methods, influence lines, stability, approximate methods. *(Lec. 3) Prerequisite: CVE 350.* Staff

374 Environmental Engineering I *I, 3*
Systems concerned with urban environmental problems of water supply and treatment, sewerage treatment of municipal and industrial waste waters, stream pollution, air pollution, and disposal of solid waste materials. *(Lec. 3) Prerequisite: MCE 354.* Staff

377 Biological Aspects of Water Quality
See Plant Pathology 377.

380 Soil Mechanics *I, 3*
Engineering properties of soils. Seepage, drainage, and frost action investigation. Theory of earth pressures, slope stability, and consolidation. *(Lec. 3) Prerequisite: credit or registration in CVE 220.* Nacci or Wang

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. *Prerequisite: junior standing or permission of department.* Staff

393 Senior Seminar *II, 1*
Participation in seminar discussions with members of the faculty and visiting engineers on the broad aspects of the practice of civil engineering. *(Lab. 3) S/U credit.* 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. Special problems requiring use of the University computer will be assigned in the area of each student's interest. *(Lec. 2, Lab. 3) Prerequisite: CVE 216.* Lavelle or Marcus

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) Prerequisite: CVE 346.* Moultrop

447 Highway Engineering *II, 3*
Principles of design of modern highways and streets including economic consideration, capacity, geometric layout, drainage, pavements and construction. *(Lec. 2, Lab. 3) Prerequisite: CVE 346.* Moultrop

453 Computer Analysis of Structures *I, 3*
Introduction to matrix methods of structural analysis. Solutions of planar structures using a digital computer. *(Lec. 3) Prerequisite: CVE 351 and 396.* Lavelle

460 Analysis and Design of Metal Structures *I, 3*
Properties of metals. Current design criteria and practice for the design of steel elements. Elastic and inelastic behavior and design of tension, compression, flexural, and beam-column members. Design of connections. Comprehensive design problems. *(Lec. 2, Lab. 3) Prerequisite: CVE 350. Not for graduate degree program credit.* Staff

465 Analysis and Design of Concrete Structures *II, 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) Prerequisite: CVE 350. Not for graduate degree program credit.* Staff

470 Water Supply and Treatment *II, 3*
Development of surface and ground water supplies, water transportation and distribution systems. Water treatment processes including chemical coagulation and precipitation, water softening, iron and manganese removal, disinfection, corrosion control, and saline water conversion. *(Lec. 2, Lab. 3) Prerequisite: CVE 374 or permission of instructor. Not for graduate degree program credit.* Campbell

471 Municipal Waste Water Systems *I, 3*
Development of systems for the collection and conveyance of municipal waste waters. Treatment of waste waters by physical, chemical, and biological systems. Reuse of waste waters. Regional systems development and financing. *(Lec. 2, Lab. 3) Prerequisite: CVE 374 or permission of instructor. Not for graduate degree program credit.* Campbell

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) Prerequisite: permission of department.* Staff

473 Analysis of Air Pollutants *I or II, 3*
Pollutants in the atmosphere. Methods of sampling and interpretation, and methods of analysis of pollutants in gases, vapors, mists, dusts and fumes. Laboratory includes methods of sampling and analysis of air pollutants. *(Lec. 2, Lab. 3) Prerequisite: CHM 110 or permission of department.* Staff

478 Solid Waste Disposal and Management *II, 3*
Sources, collection and treatment methods for the removal of solid wastes from the environment. Recovery and reuse of waste materials. Economics of solid wastes and by-products. Interrelation between solid wastes, air and water pollution. *(Lec. 3) Prerequisite: permission of department.* Sussman and 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) Prerequisite: CVE 380 or permission of instructor.* Nacci or Wang

482 Soil Engineering *II, 3*
Strength, stability and settlement considerations in the design of foundation, retaining wall, and earth dam structures. Sub-surface investigations and economic factors involved in the selection of suitable foundations. *(Lec. 2, Lab. 3) Prerequisite: CVE 380.* Nacci or Wang

483 Foundation Engineering *I or 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 of actual engineering problems. *(Lec. 2, Lab. 3) Prerequisite: CVE 380.* Nacci

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 problems. Credits not to exceed a total of 12.) Prerequisite: permission of department.* Staff

521 Advanced Strength of Materials *I or II, 3*

524 (or OCE 524) Marine Structural Design *I or II, 3*

551 Advanced Structural Analysis *I, 3*

565 Response of Structures to Dynamic Loads *I or II, 3*

570 Sanitary Chemistry *I, 3*

571 Sanitary Chemistry Laboratory *II, 3*

572 Biosystems in Sanitary Engineering *I or II, 3*

575 Open Channel Hydraulics *I or II, 3*

584 Principles of Pavement Design *I or II, 3*

585 Soil Stabilization *I or II, 3*

586 Physico-chemical Properties of Soils *II, 3*

587 Ground Water Flow and Seepage Pressures *I, 3*

596 Numerical Methods in Structural Engineering *I or II, 3*

CLASSICS (CLA)

SECTION HEAD: Assistant Professor Cashdollar

391 Masterpieces of Greek Literature *I, 3*
Representative genres of the Greek classics in translation. *(Lec. 3)* Cashdollar

392 Masterpieces of Roman Literature *II, 3*
Representative genres of the Roman classics in translation. *(Lec. 3)* Campbell

393 Literature of Greek Mythology *I and II, 3*
Myths, folk-tales and legends of ancient Greece. Readings from Greek and Roman literature in translation. Emphasis on literary, historical and religious aspects of mythology. *(Lec. 3)* Cashdollar

COMMUNICATIONS

Business Education
227 Business Communications

English
110 Composition
120 Literature and Composition

Journalism
212 News Writing and Reporting
324 Magazine Article and Feature Writing

Scratch
000W Basic Composition
000X College Writing
000Y Advanced Composition
000Z Research Paper Writing

Speech
101 Fundamentals of Oral Communication
102 Public Speaking
215 Argumentation and Debate
220 Group Discussion

COMMUNITY PLANNING (CPL)

ACTING DIRECTOR: Associate Professor Hammerschlag

410 Fundamentals of Urban Planning *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.* Foster

503 Urban Planning and Politics in the Metropolis *I or II, 3*

505 Values and Prediction in Planning *I, 3*

511 Introduction to Community Planning, History and Theory *I, 3*

532 (or REN 532) Land Resource Economics *II, 3*

551, 552 Problems in Planning Practice *I and II, 3 each*

COMPUTER SCIENCE (CSC)

CHAIRMAN: Professor Hemmerle (Computer Science and Experimental Statistics)

201 Introduction to Computing *I and II, 3*
Algorithms, programs, and computers. Basic programming and program structure. Programming and computing systems. Debugging and verification of programs. Data representation. Organization and characteristics of computers. Survey of computers, languages, systems, and application. Computer solution of several numerical and non-numerical problems using one or more programming languages. *(Lec. 3) Not open to students who have received credit for CSC 101.* Staff

410 Introduction to Computer Science and Algorithmic Processes *I and II, 3*
Concepts and properties of algorithms, language and notations for describing algorithms, analysis of com-

putational problems and the development of algorithms for their solution, application of a specific procedure oriented language to solve simple numerical and non-numerical problems using a computer. *(Lec. 3) Prerequisite: MTH 142 and CSC 201.* Staff

411 Computer Organization and Programming *I and II, 3*
Logical structure of computer systems, information representation, instruction codes, arithmetic and logical operations, flow of control. Assembly language programming, input-output, sub-routines, linkages, macros, conditional assemblers. *(Lec. 3) Prerequisite: CSC 410 or equivalent.* Tetreault and Carrano

412 Programming Systems *II, 3*
Structure of monitor and executive systems, time-sharing systems, real-time systems, input-output systems, file organization and manipulations, command languages. *(Lec. 3) Prerequisite: CSC 411.* Tetreault

413 Data Structures *I, 3*
Formal data structures. Algorithms for handling such common structures as arrays, linear lists, trees and multi-linked lists. Searching and ordering techniques. Data management systems. Data structures in programming languages. *(Lec. 3) Prerequisite: CSC 410, MTH 215.* Staff

491, 492 Problems in Computer Science *I and II, 1-3 each*
Advanced work in computer science. Courses will be conducted as seminars or as supervised individual projects. *(Lec. or Lab. arranged)* Staff

500 Scientific Applications of Digital Computers I *I, 3*

502 Theory of Algorithmic Languages and Compilers *II, 3*

505 Design of Digital Circuits *I, 3*

512 Advanced Programming Systems *I, 3*

515 Theory of Computation *I, 3*

525 (or IDE 525) Simulation *II, 3*

535 Information Organization and Retrieval *II, 3*

551 Scientific Applications of Digital Computers II *II, 3*

581 (or ELE 581) Intelligence in Machines and Humans *I or II, 3*

591, 592 Problems in Computer Science *I and II, 1-3 each*

DENTAL HYGIENE (DHY)

CHAIRMAN: Associate Professor B. Wilson

101 Orientation to Dental Hygiene *I, 1*
Philosophies, concepts, and procedures needed before beginning experience in dental hygiene clinic. Factors which contribute to healthful conditions of the mouth, study of toothbrush and methods of toothbrushing, and chair instruction in dental health of patient. *(Lec. 1)* Wilson

125 Oral Anatomy *I, 3*
Morphology of tooth structure, laboratory instruction in drawing, carving, and identifying tooth forms. *(Lec. 2, Lab. 4)* Bliss

126 General and Oral Histology and Embryology *II, 3*
Consideration of cytology, development and microscopic anatomy of oral cavity. *(Lec. 2, Lab. 2) Prerequisite: DHY 125.* Persechino

128 Periodontics *II, 1*
Classification of periodontal disease, clinical picture, causative factors, and types of treatment. *(Lec. 2)* DeCesare

135 Prophylactic Technique Laboratory *I, 1*
Dental prophylaxis as a treatment in preventive and corrective dentistry. Instruction on mannikin heads to develop operative technique in removing deposits and stains from exposed surfaces of teeth. *(Practicum 6) Prerequisite: permission of department chairman.* Ladd

136 Dental Hygiene Clinic *II, 2*
Clinical training in dental prophylaxis on children and adult patients. Clinical experience in mouth examination and charting, dental X-ray exposure and development, tooth decay preventive treatments for children, and patient education in dental health. *(Practicum 9)* Staff

141 Dental Assisting *I, 1*
Lectures, clinical observations, and practice devoted to methods of assisting dentists. *(Practicum 4)* Cowen and Staff, Dental Clinic, NAS, Quonset Point

227 General and Oral Pathology *I, 3*
Study of disease with emphasis on relationship of general disease to diseases of teeth and supporting tissues. Specific study of oral diseases and importance of recognition of abnormal conditions in mouth by dental hygienist. *(Lec. 2, Lab. 2)* Allegra, Broderick and England

231 Roentgenology *I, 2*
Lecture, demonstration, and practice course covering elementary electricity, theory and development of X-ray and X-ray apparatus, and technique for taking and processing dental X-ray films with practice in operating X-ray equipment. *(Lec. 1, Practicum 3)* Wilson

237 Dental Hygiene Clinic *I, 2*
Continuation of DHY 136. *(Practicum 12)* Staff

238 Dental Hygiene Clinic *II, 2*
Continuation of DHY 237. *(Practicum 12)* Staff

244 Dental Materials and Operative Technique *II, 1*
Lectures and demonstrations, including laboratory exercises, in preparation and manipulation of materials used in restorative dentistry. Visual aids used to demonstrate construction of restorations and correct identification and use of dental instruments. *(Practicum 2)* Mazzucchelli

246 Ethics, Jurisprudence, and Office Management *II, 1*
Dental office procedures with emphasis on patient recall programs. Laws and ethics relating to practice of dentistry and dental hygiene. *(Lec. 2)* Kershaw

250 Dental Health Education *II, 2*
Methods and materials used in teaching dental health to patients in private dental practice and in schools. *(Lec. 2)* Wilson

252 Public Health *II, 2*
Philosophy and background of public health practice. Observation and patient counseling in maternal and child health programs and prenatal clinics, and surveys to determine existing dental needs in community. *(Lec. 2)* Wilson

254 Survey of Dental Specialties *II, 1*
Survey of major specialties in dentistry: endodontics, pedodontics, orthodontics, and oral surgery. *(Lec. 2)* Feldman, Holton, Nelson and Schwab

260 Preventive Dentistry *II, 2*
Measures employed to arrest dental caries including bacteriology of dental caries, fluoridation, and diet therapy, and a review of current literature in preventive dentistry. *(Lec. 1, Lab. 2)* Yacovone

EARTH SCIENCE (ESC)

CHAIRMEN: Professor Alexander (Geography) and Professor J. A. Cain (Geology)

104 (or GEG 104) Geographical Earth Science *I and II, 4*
The earth's physical environment, its atmosphere and hydrosphere: the earth as a globe, weather, storms, air pollution, climate, and glaciers. Reciprocal relationships between man and his environment are emphasized. *(Lec. 3, Lab. 2) Not open to students who have passed GEG 101.* Havens

105 (or GEL 105) Geological Earth Science *I and II, 3*
Introductory study of the earth for nongeology majors. Includes volcanism, earthquakes, mountain-building, Ice Ages, history of the earth, evolution of life. Current topics such as continental drift, seafloor spreading, environmental geology and lunar geology are introduced. *(Lec. 3) Not open to students who have passed GEL 103 or 104. ESC 104 is not prerequisite to ESC 105.* Staff

106 (or GEL 106) Geological Earth Science Laboratory *I and II, 1*
Investigative problems in geological earth science emphasizing both collection of field data and the experimental approach. Several afternoon field trips. *(Lab. 2) Prerequisite: prior or concurrent registration in ESC 105.* Staff

301 Environmental Remote Sensing *II, 3*
Introduction to interdisciplinary aspects of environmental remote sensing. Topics include image and non-image sensing applied to geographic mapping, land-use, forestry, geology, engineering, urban-industrial patterns, wildlife management and ecology. *(Lec. 3) Prerequisite: RDV 100 or junior standing or permission of instructor.* Fisher and Staff

ECONOMICS (ECN)

CHAIRMAN: Professor Sabatino

123 Elements of Economics *I and II, 3*
Survey of principles and institutions underlying the production and distribution of goods and services and the determination of income, employment and the general level of prices. *(Lec. 3) Not open to students who have passed ECN 125.* Staff

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) Prerequisite: for ECN 126, ECN 123 or 125 or permission of department. ECN 125 is not open to students who have passed ECN 123.* Staff

300 Radical Critiques of Contemporary Political Economy *II, 3*
Radical right and radical left critiques of the mainstream of economics. Radical views on values, methodology, production planning, income distribution, economic power, the military-industrial complex, imperialism and racial and sexual discrimination. *(Lec. 3) Prerequisite: ECN 123 or 125, or permission of the instructor.* Rayack

302 Economic Development of the United States *I or II, 3*
Developmental factors in American economic life are discussed with the object of introducing students to the past and present business environment. *(Lec. 3) Prerequisite: ECN 123 or 126 or permission of department.* Haller and Brown

327 Intermediate Economic Theory: Income and Employment *I or II, 3*
Measurement of national income. Theory of the de-

termination of the general level of income, employment, and prices. Business fluctuations. *(Lec. 3) Prerequisite: ECN 126, 990 or permission of instructor.* Latos

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) Prerequisite: ECN 126 or permission of instructor.* Rayack

333 Transportation Principles *I, 3*
Role of transportation agencies in the American economy. Organization, management and operation of agencies. Pattern of regulations, state and federal. Relation of regulation to current transportation problems. *(Lec. 3) Prerequisite: ECN 123 or 126 or permission of department.* 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) Prerequisite: ECN 126 or permission of instructor.* Barnett and Brown

337 Business and Government *I or II, 3*
Historical and present attitudes and policies of the various levels of government toward the changing structure of American business. Emphasis upon the legal and economic concepts of business activity. *(Lec. 3) Prerequisite: ECN 123 or 126 or permission of instructor.* Dirlam and Hellman

342 Public Finance *I or II, 3*
Examination of the theory and practice of public expenditures, revenues, debt and fiscal policy, with major emphasis on federal fiscal affairs. *(Lec. 3) Prerequisite: ECN 123 or 126 or permission of instructor.* Starkey

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) Prerequisite: ECN 126 or permission of instructor. S/U credit.* Staff

361 A Survey of Economic Thought *I or II, 3*
Economic thought from ancient times to present; characteristics of classical, neo-classical and contemporary development. *(Lec. 3) Prerequisite: ECN 123, 126 or permission of instructor.* Schurman

363 Economic Growth and Development *I or II, 3*
Basic problems in economic growth and development of so-called backward or pre-industrial countries of world. Emphasis on population trends, agrarian reforms, capital formation, international aid programs and respective roles of private and public enterprise. *(Lec. 3) Prerequisite: ECN 123, 126 or permission of instructor.* Suzawa

375 Introduction to Quantitative Methods I *I or II, 3*
Introduction to the mathematical techniques used in modern economic theory. Linear algebra, the calculus of several variables, constrained maximization and differential equations. Applications to economic problems. *(Lec. 3) Prerequisite: ECN 126 and MTH 141 or permission of instructor.* Hume

376 Introduction to Quantitative Methods II *I or II, 3*
Introduction to the application of econometric methods to economic problems. Econometric tools applied to micro- and macroeconomic problems. *(Lec. 3) Prerequisite: ECN 126 and 375, or permission of instructor.* Staff

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) Prerequisite: ECN 123 or 126, or permission of instructor.* Latos

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) Prerequisite: ECN 123 or 126, or permission of instructor.* Haller

438 International Trade and Policy *I or II, 3*
Basic theory and major institutions of international economic relations. Analysis includes determinants of foreign trade, the balance of payments, foreign exchange, foreign investment, protectionism, free trade and aid to underdeveloped countries. *(Lec. 3) Prerequisite: ECN 123, 126 or permission of instructor.* Farrell

464 Comparative Economic Systems *I or II, 3*
Economic organization in capitalist and non-capitalist nations with particular emphasis on Soviet-U.S. comparisons. Market and planning mechanisms, industrial structure, growth rates, and allocation of economic resources. *(Lec. 3) Prerequisite: ECN 123, 126 or permission of instructor.* Schurman

503 Development of the United States Economy *I, 3*

512 History of Economic Analysis *II, 3*

515, 516 Economic Research *I and II, 3 each*

527 Macroeconomic Theory *I, 3*

528 Microeconomic Theory *I, 3*

532 Industrial Organization and Public Policy *II, 3*

538 International Economics: Theory and Policy *I or II, 3*

539 Welfare Economics *I or II, 3*

543 Public Finance and Fiscal Policy *I, 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 or II, 3*

576 Econometrics I *II, 3*

577 Econometrics II *II, 3*

595 (or PSC 595, GEG 595, SOC 595 or REN 595) Problems of Modernization in Developing Nations *II, 3*

EDUCATION (EDC)

CHAIRMAN: Professor R. MacMillan

102 Introduction to American Education *I and II, 3*
The school as an agency of modern society with emphasis on role of teacher in school and community. *(Lec. 3)* Staff

103 Introduction to Education *I and II, 3*
Parallels EDC 102. Integrated series of professional laboratory experiences. Required for students in the general teacher education curriculum. *(Lec. 3, Lab. 1) Open only to students admitted into the general teacher education curriculum.* Staff

305 Fundamentals of Theatre Practice
See Theatre 305.

312 The Psychology of Learning *I and II, 3*
Principles of psychology as related to learning and teaching processes. *(Lec. 3) Prerequisite: EDC 102, PSY 113.* Staff

313 The Psychology of Learning *I and II, 3*
Parallels EDC 312. Integrated series of professional laboratory experiences. Required for students in the general teacher education curriculum. *(Lec. 3, Lab. 1) Prerequisite: EDC 103 and PSY 113. Open only to students admitted into the general teacher education curriculum.* Staff

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 an integral part of the curriculum in the elementary school. *(Lec. 3) Open only to elementary GTE students.* Staff

334 Teaching of Home Economics *I and II, 3*
Selection, organization and use of instructional materials, study of methods and techniques. *(Lec. 3) Prerequisite: EDC 102 or permission of department.* May and MacKenzie

337 Teaching of Home Economics *I and II, 3*
Evaluation of existing homemaking programs in public schools and development of curriculum materials for beginning teachers. Observation in nearby schools. *(Lec. 2, Lab. 3) Prerequisite: EDC 334.* May and P. Kelly

367 School Health Program
See Physical Education for Men 367.

368 Methods and Materials in Physical Education
See Physical Education for Men 368.

371 Educational Measurements *I and II, 3*
Aptitude, achievement tests, and other measuring instruments used in classification and guidance of pupils, improvements of instruction and other activities of the teacher. Principles applied in construction and use of tests and to interpretation and evaluation of scores. General course for elementary and secondary school teachers. *(Lec. 3) Prerequisite: EDC 312 or 313.* Allen

372 Educational Measurements *I and II, 3*
Parallels EDC 371. Integrated series of professional laboratory experiences. Required for students in the general teacher education curriculum. *(Lec. 3, Lab. 1) Prerequisite: EDC 103, concurrent registration in EDC 313, and enrollment in general teacher education curriculum.* Allen and Soderberg

401 Development and Utilization of Intructional 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) Prerequisite: senior standing and six hours of education.* Cresser and Howard

403 History of Education *I, 3*
Historical growth of educational theories, institutions and practices for purpose of introducing student to problems of democratic education of present. *(Lec. 3) Prerequisite: junior standing. In alternate years, next offered 1975-76.* Calabro

407 Philosophy of Education *II, 3*
Philosophies underlying modern education; relates education to contemporary society. *(Lec. 3) Prerequisite: junior standing. In alternate years, next offered 1974-75.* Russo

409 Health Aspects of Aging *I and II, 3*
Seminar approach in dealing with health problems of aging, maintenance of optimal physical and mental health, and health programs and facilities for the elderly. Field trips to selected health programs or health care facilities. *(Lec. 3) Prerequisite: EDC 505 or permission of department.* Staff

410, 411 Seminar and Supervised Field Practicum in Education of the Aging *I and II, 3 each*
Adult educational methods as applied to older adults,

including preretirement education, current education programs for the elderly, and evaluation of educational activities with the aging. Supervised field practicum of 150 hours. *(Lec. 2, Lab. 3) Prerequisite: EDC 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 development understanding. *(Lec. 3) Prerequisite: EDC 313 or graduate standings.* Aukerman and Bumpus

427, 428 Child and Curriculum I and II *I and II, 3 each*
Principles and practices of guiding children in skillful use of basic means of communication (speaking, writing, listening and reading), and with materials in social studies, science and mathematics in their applications for educating elementary school children. *(Lec. 3) Prerequisite: PSY 113 and 232, EDC 313, concurrent registration in both courses, and permission of department. Open only to students admitted into the elementary education curriculum. Not for graduate degree program credit.* Nagel, Nally, and Whitcomb

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) Prerequisite: EDC 103 and 313, PSY 232, senior standing and permission of instructor. Open only to students admitted into the secondary education curriculum. Sectioned in accordance with the student's academic major: business, English, mathematics, modern language, science, social studies. Sem. II: Business Administration students only. Not for graduate degree program credit.* Staff

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 Agri-Business and Natural Resources *I, 3*
Organization of instructional programs; development of resource units, teaching plans, methods, techniques, and occupational experience programs. *(Lec. 3) Prerequisite: EDC 103 and 313. Not for graduate degree program credit.* McCreight

450 Introduction to Guidance *I and II, 3*
Principles and techniques of guidance, study of philosophies of guidance, history and development of guidance movement, counseling methods and general organization of student personnel facilities. *(Lec. 3) Prerequisite: graduate standing or permission of department.* Staff

478, 479 Problems in Education *I and II, 1-3 each*
Advanced work in education. Conducted as seminars or as supervised individual projects. *(Lec. or Lab.) Prerequisite: 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 for student teaching are: Secondary non-vocational, S/U credit; Elementary Education, S/U credit; Home Economics, S/U credit; Resource Development; Business; Music; Physical Education; Theatre. *Prerequisite: 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, the use of resource materials and cooperative help of other members of seminar. Areas for seminar are: Secondary non-vocational, Elementary Education, Home Economics, Resource Development, Business, Music, Physical Education, Theatre. *(Lec. 3) Prerequisite: concurrently with EDC 484, permission of department. Not for graduate degree program credit.* Staff

490 Home Economics Education Grades 1 through 6 *I and II, 2*
Development of home economics curriculum for the elementary school with emphasis on integration of home economics objectives with existing school curriculum. Guided field experience. May be taken concurrently with EDC 484, 485. *(Lec. 4) Prerequisite: CDF 200, EDC 312, EDC 334 or permission of department.* MacKenzie

491 Home Economics Education Teaching Adults *I and II, 2*
Planning and preparing curriculum materials for adult education classes in home economics, based on a study of adult needs and interests. Participation in actual teaching of adult classes. One-half semester course which may be taken concurrently with EDC 484, 485. *(Lec. 4) Prerequisite: EDC 334 or permission of department.* P. Kelly and May

503 Education in Contemporary Society *I and II, 3*

504 Adult Basic Education *I and II, 3*

505 Principles and Practices of Leadership Development for Youth and Adult Programs *I or II, 3*

506 Methods of Teaching Home Economics *I or II, 3*

507 Curriculum Study in Home Economics *I or II, 3*

508 Supervision of Home Economics *I or II, 3*

509 Seminar in Home Economics Education *I or II, 3*

510 Practicum in Incorporating Televised Media *I, 3*

511 Evaluation of Film and Recorded Material *I, 3*

512 Organization and Administration of Audiovisual Programs *II, 3*

513 Research and Theory in Instructional Technology *II, 3*

514 Current Trends in Elementary Education *I, 3*

520 Teaching of Arithmetic *I, 3*

523 Physical Factors Related to Reading Disability *I, 3*

526 Teaching the New Grammars *I, 3*

528 Teaching Language Arts *II, 3*

529 Foundations of Educational Research *I and II, 3*

531 (or FNS 531) Teaching of Nutrition *I or II, 3*

534 Mathematics in the Secondary School *II, 3*

541 Reading in Secondary School Content Subjects *I and II, 3*

550 Vocational Information and Career Development *I and II, 3*

551 Counseling Techniques *I and II, 3*

552 Group Procedures in Guidance *I and II, 3*

553 Counseling Practicum *I and II, 3*

554 Individual Appraisal in Guidance *II, 3*

555, 556 Supervised Field Work and Seminar in Guidance and Counseling *I and II, 3 each*

557 Principles and Practices of Student Personnel Services in Higher Education *I, 3*

558 Organization and Administration of Student Personnel Services in Higher Education *II, 3*

561 Analysis of Reading Disabilities *I, 3*

562 Techniques in Remedial Reading *II, 3*

563 Reading Programs for the Disadvantaged *I, 3*

564 Beginning Reading Programs *II, 3*

565 Analysis and Evaluation of Current Research in Reading *II, 3*

566, 567 Practicum in Reading *I and II, 3 each*

570 Elementary School Curriculum *II, 3*

571 The Secondary School Curriculum *II, 3*

572 Cooperative Supervision *I and II, 3*

573 Seminar—Educational Research *I and II, 1*

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*

580 Organizing and Administering Youth Programs *I or II, 3*

581 Organizing and Administering Programs of Adult Education *I or II, 3*

582 Curriculum Development in Vocational-Technical and Extension Education *I, 3*

583 Analyzing Community Needs and Resources for Youth and Adult Programs *I, 3*

584 The Adult and the Learning Process *I and II, 3*

585 Seminar on Leadership for Youth and Adult Programs *II, 3*

586, 587 Problems in Education *I and II, 3 each*

588, 589 Supervised Field Practicum and Seminar in Youth and Adult Education *I and II, 3 each*

590 Social Issues in Urban Education *II, 3*

594 Organization and Supervision of Reading Programs *II, 3*

ELECTRICAL ENGINEERING (ELE)

CHAIRMAN: Professor Polk

210 Introduction to Electricity and Magnetism *I, 3*
Static electric and magnetic fields; Gauss's and Coulomb's laws; capacitance and inductance. Behavior of electric charges in stationary and moving fields. Lumped vs. distributed parameters, electric and mechanical circuit concepts, topological circuit principles and circuit theorems. *(Lec. 3) Prerequisite: MTH 141 and 142.* Staff

211 Linear Systems and Circuit Theory I *II, 3*
Application of Kirchhoff'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) Prerequisite: ELE 210 or PHY 214.* Staff

215 Electrical Measurements *II, 2*
Methods of measurement, theory of operation and proper use of certain electrical instruments, nature and theory of errors of measurement, and treatment of data. *(Lec. 1, Lab. 3) Prerequisite: ELE 210 or PHY 214.* Staff

220 Electric Circuits, Measurements, and Electronics *II, 3*
Passive and active electric circuits; introduction to electronic devices; theory of electrical measurements. *(Lec. 3) Prerequisite: ELE 210 or PHY 214. Open only to students not majoring in electrical engineering or engineering science.* Staff

312 Linear Systems and Circuit Theory II *I, 4*
Continuation of ELE 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, Lab. 3) Prerequisite: ELE 211.* Staff

313 Linear Systems *II, 3*
Fourier series, Fourier transform, bilataeral 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) Prerequisite: ELE 312.* 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) Prerequisite: MTH 244.* 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) Prerequisite: ELE 322.* 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) Prerequisite: ELE 211 and ELE 215.* 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. *Prerequisite: junior standing and permission of department.* Staff

Prerequisites for all 400, 500, and 600 level electrical engineering courses: mathematics through differential equations (MTH 244) 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 ELE 481, 482, 505, 537, 588, and 589 for students with suitable backgrounds.

411 Microwave and Quantum Electronics *I, 3*
Impedance transformation and matching on transmission lines and wave guides. Solution of wave equation for wave guides and resonant cavities. Modes in laser resonators. Refraction and diffraction phenomena, antennas, holography. Introduction to generation of electromagnetic energy at microwave and optical frequencies. *(Lec. 3) Prerequisite: ELE 323.* Staff

413 Microwave and Quantum Electronics Laboratory *I, 3*
Measurements on distributed parameter systems such as transmission lines, wave guides and cavity resonators. Experimental study of tube and solid state microwave and optical generators (lasers), antenna systems, diffraction, refraction, imaging properties of lenses, spatial filtering, optical information processing and holography. *(Lec. 1, Lab. 4) Prerequisite: ELE 411, which may be taken concurrently.* Staff

417 Direct Energy Conversion
See Mechanical Engineering 417.

427 Electromechanical Devices *I, 3*
Principles of electromechanical energy conversion. Development of models for stationary and rotating electromagnetic devices. Introduction to special transducers and sensors. *(Lec. 2, Lab. 3) Prerequisite: ELE 313, 322.* Staff

431 Electrical Engineering Materials I *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) Prerequisite: ELE 322, PHY 342 and MCE 341 or PHY 420.* Staff

432 Electrical Engineering Materials II *II, 3*
Continuation of ELE 431. Further application of semiconductors and P-N junction devices and theory of dielectric and magnetic materials. *(Lec. 3) Prerequisite: ELE 431 or equivalent.* Staff

433 Electrical Engineering Materials Laboratory *II, 3*
Supplements ELE 431 and ELE 432. Students fabricate simple devices and measure their electrical and/or optical properties or study the basic properties of some solid, usually semiconducting samples. Practical aspects of solid state engineering are emphasized. *(Lec. 1, Lab. 4) Prerequisite: credit or registration in ELE 431 and 432.* Staff

436 Communication Systems *I and II, 3*
Representation of signals and noise. Basic principles of modulation and demodulation. Waveform and digital transmission systems. *(Lec. 3) Prerequisite: ELE 312 and ELE 313 or equivalent knowledge of linear circuit theory, elementary electronics and transform methods.* Staff

437 Introduction to Photo-electronic Devices *I and II, 3*
Elemental solid state sensors, scanners, remote and

direct viewing image tubes and solid state devices, electron optics. *(Lec. 3) Prerequisite: ELE 431, which may be taken concurrently, or equivalent.* Staff

443 Electronics II *I, 5*
Continuation of ELE 342. Application of signal flowgraphs as an aid to design. Thermal stability of stages. Applications of circuit analysis program, ECAP. Design of multiple transistor circuits. Feedback. *(Lec. 3, Lab. 5) Prerequisite: ELE 342.* Staff

444 Electronics III, Pulse and Digital Circuits *II, 4*
Extension of the fundamental ideas of ELE 342 and 443 to the analysis and design of pulse forming and switching circuits. Piece-wise linear approach to the non-linear behavior of electronic devices. *(Lec. 3, Lab. 3) Prerequisite: ELE 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) Prerequisite: ELE 313.* Staff

458 Systems Laboratory *II, 3*
Analytical, experimental, and computer simulation studies of typical control, communication, and biosystems problems. *(Lec. 1, Lab. 4) Prerequisite: ELE 457.* Staff

481, 482 Biomedical Engineering Seminar *I and II, 1 each*
Discussion, analysis and presentation of biomedical engineering topics related to current literature in field of student's interest. *Prerequisite: permission of department.* Bird or Jaron

New 10-71 **484 Modeling of Physiological Systems**
See Zoology 484.

491, 492, 493 Special Problems *I and II, 1 each*
Special engineering problems assigned to student according to his interests and capabilities. *(Lec. or Lab) Prerequisite: permission of instructor.* Staff

501 Linear Systems Theory *I, 3*

503 (or MCE 503) Linear Control Systems *I, 3*

505 (or CSC 505) Design of Digital Circuits *I, 3*

506 Digital Signal Processing *II, 3*

509 Systems with Random Inputs *I or II, 3*

511 Electromagnetic Fields *I, 3*

514 Microwave Electronics *I or II, 3*

515 Quantum Electronics *I or II, 3*

516 Planetary Electrodynamics *I or II, 3*

517 Magnetofluidmechanics *I or II, 3*

520 Fourier Optics *I or 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 Electronic Instrumentation and Control Circuits *I and II, 3*

538 Principles of Remote Sensing *I or II, 3*

539 Infrared Imaging Techniques *I or II, 3*

545 Optimization and Variational Problems in Electrical Engineering *I or II, 3*

561 Information Transmission *I or II, 3*

565 Fundamentals of Signal Theory *I and II, 3*

571 (or OCE 571) Underwater Acoustics I *I, 3*

575 Electroacoustical Engineering I *I and II, 3*

576 Electroacoustical Engineering II *I and II, 3*

581 (or CSC 581) Intelligence in Machines and Humans *I or II, 3*

586 Biomedical Electronics I *I and II, 3*

587 Biomedical Electronics II *I and II, 3*

588 Biomedical Engineering I *I and II, 3*

589 Biomedical Engineering II *I and II, 3*

591, 592 Special Problems *I and II, 1-3 each*

ENGINEERING (EGR)

COORDINATOR: Assistant Dean Goodwin

101 Introduction to Engineering *I and II, 1*
A survey of the field of engineering, and a study of the different branches in particular. An introduction to methods and means of computation for solving engineering problems. *(Lec. 1)* Goodwin

102 Basic Graphics *I and II, 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)* Bachelder and Staff

110 The Energy Crisis *I or II, 1*
Energy sources available to man, and their conversion by internal combustion engine, gas turbine, steam turbine, fuel cell, nuclear reactor, and other means. Problems of supply and demand, potential exhaustion and pollution. Future availability of nonpolluting energy sources. *(Lec. 3 for one-third semester) Prerequisite: high-school physics or chemistry.* Conta

111 Mathematical Formulation of Engineering Problems *I or II, 1*
Brief recapitulation of high-school mathematics, always emphasizing and testing the student's ability to employ the material. Carefully selected and challenging sequence of problems drawn from simple engineering, physics and everyday life. *(Lec. 3 for one-third semester) Prerequisite: high-school algebra and trigonometry.* Lengyel or Tufts

112 Radio Propagation and Antennas *I or II, 1*
Preview of more advanced engineering courses concerned with questions concerning tall towers used as broadcast antennas, "dishes" employed as radar antennas and in microwave relays of the telephone company, radio reception differences at night and during the day, etc. *(Lec. 3 for one-third semester) Prerequisite: high-school algebra and trigonometry.* Polk

113 Engineering Approaches to Contemporary Societal Problems *I or II, 1*
Review of selected global problems from an elementary engineering standpoint. Input-output analyses, quantitative approaches to world energy needs, population control, poverty, urban growth and decay, ecological crises. Comparison of quantitative and qualitative methods. *(Lec. 3 for one-third semester)* Nash

114 Environmental Pollution Control *I or II, 1*
Sources, effects and the control of pollution. Problems involved in water, atmospheric and solid waste pollution. Technological, political and economic factors of pollution control. *(Lec. 3 for one-third semester) Prerequisite: high-school chemistry or physics.* Sussman and Poon

115 Structural Engineering: Past, Present and Future *I or II, 1*
The historical development of structural engineering, the effects of building codes on present structures, structures of the future. *(Lec. 3 for one-third semester)* Marcus and Fang

F 118X F 120X F 123X
F 119X F 121X S 117X

203 Engineering Graphics *I and II, 1*
Advanced theory of descriptive geometry with applications to engineering problems, including line and plane problems, plane curves, ruled, warped and double-curved surfaces, intersections and developments, axonometric and perspective projections. *(Lab. 3) Prerequisite: EGR 102.* Bachelder and Staff

204 Technology and Society (304) *I and II, 3*
Development of technology and its interrelationship with social conditions from the historical point of view, including a survey of the technological basis of modern society. A background in technology and its importance for non-engineers and for engineers an appreciation of the historical development of their profession. No prior engineering or science required. *(Lec. 3)* Bradbury

ENGLISH (ENG)

CHAIRMAN: Professor J. Y. Miller

101 Introduction to Literature: Genres *I and II, 3*
Extensive reading in various forms of literature. Discussion and regular written criticism. *(Lec. 3) Not for English concentration credit.* Staff

102 Introduction to Literature: Theme *I and II, 3*
A theme such as Love and War, the Hero, Social Protest, Utopia, etc., in literature. Discussion and regular written criticism. *(Lec. 3) Not for English concentration credit.* Staff

110 Composition *I and II, 3*
Emphasizes correctness in writing and clear presentation of ideas. Reading exercises in exposition, and composition of essays. *(Lec. 3) Not a prerequisite for ENG 120. Not for English concentration credit.* Staff

112 Composition (Foreign) *I and II, 3*
Same as ENG 110, but restricted to students whose mother tongue is not English and who have need of special and closely supervised assistance in expressing themselves in English. *(Lec. 3) Prerequisite: admission upon recommendation of department.* R. M. Tutt

113 Composition (Fisheries) *I, 3*
Same as ENG 110. Admission restricted to students in the special two-year fisheries program upon recommendation by the College of Resource Development. *(Lec. 3)* Staff

120 Literature and Composition *I and II, 3*
Continuation of ENG 110. Extensive reading in various forms of writing. Training in appreciation and criticism of good literature. Regular written criticism and literary exercises. *(Lec. 3) ENG 110 not a prerequisite for ENG 120. Not for English concentration credit.* Staff

122 Literature and Composition (Foreign) *I and II, 3*
Same as ENG 120, but continuation of ENG 112. *(Lec. 3) Prerequisite: admission upon recommendation of department. Students enrolled in ENG 112 will be assumed to continue in ENG 122 unless otherwise recommended by the instructor.* R. M. Tutt

231 Literature of the Bible *II, 3*
Introduction to poetry and narrative in the Old Testament and the Apocrypha, primarily in the Authorized (King James) Version. *(Lec. 3)* Sorlien

241, 242 American Literature *I and II, 3 each*
ENG 241: Selections from American literature, be-

ginnings to the Civil War. *ENG 242:* Selections from American literature, latter part of the nineteenth century to the present. *(Lec. 3) ENG 241 not prerequisite for ENG 242.* Staff

251, 252, 253 English Literature *I and II, 3 each*
ENG 251: Selections from English literature, beginnings to 1660. *ENG 252:* Selections from English literature, 1660-1832. *ENG 253:* Selections from English literature, 1832 to the present. *(Lec. 3) None of these courses is prerequisite for any other.* Staff

255 A Survey of English Drama *I, 3*
Development of English drama from its beginnings to present day. Plays read will be selected on basis of their historical importance and intrinsic worth. *(Lec. 3)* Staff

261, 262 World Literature *I and II, 3 each*
Introduction to some masterpieces of literature other than English and American. *ENG 261:* Selective literary history of civilization revealed through Greek, Roman, Italian, and Spanish literature. *ENG 262:* Selections from great works of French, Russian, German, and Scandinavian literature. Reading is done in translation. *(Lec. 3) ENG 261 is not prerequisite for ENG 262.* Staff

263 Introduction to Poetry *I, 3*
Promotes intelligent reading of various forms of poetry which have developed through the ages. *(Lec. 3)* Staff

264 Introduction to Drama *I or II, 3*
Various forms of Western drama. Designed to promote an intelligent understanding of drama as a literary art form. *(Lec. 3)* Staff

265 Introduction to the Novel *I or II, 3*
Introduction to the novel form which will include appreciation of fictional themes and methods as well as significant shifts of mode, the comic, sentimental, Gothic, novel of purpose, and others. *(Lec. 3)* Staff

304 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) Prerequisite: permission of instructor.* Mathews and Petrie

305 Advanced Creative Writing *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) Prerequisite: ENG 304 and permission of department.* Mathews and Petrie

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 Structure and Development of Modern American English *I, 3*
The historical development of the English language with particular attention to the structure and analysis of present-day American English and American-English dialects. *(Lec. 3)* Titus

340 The American Short Story *I and II, 3*
Critical study of the short story in America from early nineteenth century to the present. *(Lec. 3)* Staff

341, 342 The American Novel *I and II, 3*
ENG 341: Survey of the American novel through nineteenth century. *ENG 342:* Survey of the American novel since 1900. *(Lec. 3) ENG 341 is not prerequisite for ENG 342.* Staff

343 Modern American Poetry *I and II, 3*
Major contributions and movements in American poetry from 1900 to the present. *(Lec. 3)* Goldman and Potter

345 American Negroe Literature: 1920 to the Present *I and II, 3*
Intensive study of major contributions to American literature by Negroes from the Harlem Renaissance of the 1920's to the present. Representative works in poetry, drama, fiction and essays. *(Lec. 3)* Staff

351, 352 The English Novel *I and II, 3*
ENG 351: Survey of English novel through first quarter of nineteenth century. Emphasis on Defoe, Richardson, Fielding, Smollett, Sterne, and Austen. *ENG 352:* Outstanding developments of nineteenth- and early twentieth-century novels are stressed. *(Lec. 3) ENG 351 not prerequisite for ENG 352.* Staff

353 Modern British Poetry *I and II, 3*
Major contributions and movements in British poetry from 1900 to the present. *(Lec. 3)* Staff

361, 362 The European Novel *I and II, 3 each*
ENG 361: Major developments of European novel through early nineteenth century. Special attention to Cervantes, LeSage, Goethe, Stendhal, Balzac, and Gogol. *ENG 362:* Important contributions of nineteenth- and early twentieth-century novel. Special attention to Flaubert, Turgenev, Dostoevsky, Tolstoy, Zola, and Gide. *(Lec. 3) ENG 361 not prerequisite for ENG 362.* Collins and Gullason

365 Modern Drama *I and II, 3*
Critical study of modern drama: Continental British and American. *(Lec. 3)* Staff

397, 398 Senior Honors Seminar *I and II, 3 each*
A flexible seminar restricted to those students eligible for honors in English and requiring extensive individual study and research which will culminate in a substantial honors essay. *(Lec. 3) Prerequisite: eligibility for honors in English.* Staff

433 The Elizabethan Drama *II, 3*
Critical study of outstanding plays written by Shake-

speare's predecessors, contemporaries and successors, with emphasis on Elizabethan playhouse practice. *(Lec. 3) Prerequisite: junior or senior standing.* Barker, Hills and Smith

440 Literary Heritage of New England to 1860 *I, 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) Prerequisite: ENG 241 or permission of department.* Robinson and Schoonover

441, 442 American Authors *I and II, 3 each*
Intensive study of the work of one or two outstanding American writers. *ENG 441:* Dickinson, Emerson, Hawthorne, James, Melville, Poe, Thoreau, Twain and Whitman. *ENG 442:* Eliot, Faulkner, Fitzgerald, Frost, Hemingway, O'Neill, Arthur Miller, and Tennessee Williams. *(Lec. 3) Fall, 1973: O'Neill,* Smith; *Melville and Whitman,* Marshall. *Spring 1974: Faulkner,* Goethals

444 The American Writer and the Negro *II, 3*
General survey of writings about Negroes in American literature by white as well as black authors. Study of representative works from all of American literature, providing an aesthetic and social view of the American Negro. *(Lec. 3)* Staff

445 American Romanticism *II, 3*
Major American Transcendentalists and Poe, Hawthorne, and Melville. *(Lec. 3) Prerequisite: permission of department.* Robinson

446 Modern American Drama *II, 3*
Major contributions and movements in modern American drama. *(Lec. 3)* Miller

450 The English Renaissance *II, 3*
Early developments of sonnet form and blank verse as illustrated by work of Wyatt, Surrey, Sidney and others. Attitudes and theories of period as expressed in More's *Utopia* and Bacon's *Essays* are examined in detail. *(Lec. 3) Prerequisite: junior or senior standing. In alternate years, next offered 1974-75.* Neuse and Sorlien

452 The Seventeenth Century, 1603-1660 *I, 3*
Poetical and prose works of Bacon, Johnson, Donne, Milton, and others. *(Lec. 3)* Sorlien

453 The Restoration Period *II, 3*
Major trends and developments in second half of seventeenth century as reflected in drama, verse satire, and prose of the age of Dryden, Bunyan, Locke, and Congreve. Special attention to Restoration comedy. *(Lec. 3)* Kunz and Sorlien

456 The Augustan Tradition in England *I, 3*
First half of eighteenth century in English literature, with emphasis on Addison and Steele, Pope, Gay, Swift, and Defoe. *(Lec. 3) Prerequisite: junior or senior standing.* Reaves

457 The Age of Johnson *II, 3*
Second half of eighteenth century with emphasis on Johnson, Goldsmith, Gibbon, Gray, Blake, Burns, and collapse of pseudo-classicism. *(Lec. 3) Prerequisite: junior or senior standing.* Joel

461 The Classical Epic *I, 3*
Survey of Greek and Latin epic poetry in translation, beginning with Homer and attempting to determine some principles of epic art. *(Lec. 3)* Sharpe

462 The Medieval and Modern Epic *II, 3*
Survey of nonclassical epic poetry with special emphasis upon Dante's *Divine Comedy* and Joyce's *Ulysses. (Lec. 3)* Sharpe

465 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)* Gullason

470 Chaucer *I, 3*
Study of syntax and pronunciation of Chaucer's language and appreciation of Chaucer as a poet. Emphasis on *The Canterbury Tales. (Lec. 3) Prerequisite: junior or senior standing.* MacLaine, Malina and Neuse

472, 473 Shakespeare *I and II, 3 each*
ENG 472: Introduction to plays of Shakespeare as living theatrical productions. One or more examples from each main type. Character delineation, plot construction, and stagecraft devices emphasized. *ENG 473:* A second course in Shakespeare. Critical study of those plays not included in ENG 472. *(Lec. 3) Prerequisite: junior standing. ENG 472 not prerequisite for ENG 473.* Smith, Barker and Hills

474 Milton *II, 3*
Poetry and prose of John Milton, with special emphasis on *Paradise Lost. (Lec. 3) Prerequisite: junior or senior standing and permission of department.* Neuse

475 Major English Authors of the Eighteenth Century *I or II, 3*
Intensive study of the work of one or two outstanding English authors of the eighteenth century: Defoe, Swift, Fielding, Pope, Johnson, Blake, and Boswell. *(Lec. 3) Prerequisite: junior standing or permission of instructor.* Staff

476 Browning *II, 3*
Intensive study of work of Robert Browning as the most significant of Victorian poets. *(Lec. 3) Prerequisite: permission of department.* Staff

480 The Romantic Movement, 1798-1832 *I, 3*
Major poetry and significant nonfiction prose of Wordsworth, Coleridge, Scott, Byron, Shelley, Hunt, Landor, and Keats. *(Lec. 3) Prerequisite: junior, senior or graduate standing.* Petrie and Tutt

482, 483 English Literature, 1832-1900 *I and II, 3 each*
ENG 482: The poetry, nonfiction prose, and selected novels of the early and mid-Victorian period. Emphasis will be on the work of Tennyson, Browning, Arnold, Carlyle, Dickens, Thackeray, and others. *ENG 483:* The literature of the latter nineteenth century. Emphasis will be on Rossetti, Swinburne, Meredith, Hopkins, Hardy, Housman, Wilde, and others. *(Lec. 3) Prerequisite: junior, senior or graduate standing. ENG 482 not prerequisite for ENG 483.* Goldman and Seigel

484 Modern British Literature *II, 3*
Poetry, drama, non-fiction prose, and selected fiction of the modern period. Emphasis on the work of Conrad, Joyce, Lawrence, Woolf, Yeats, Auden, Thomas, and others. *(Lec. 3) Prerequisite: junior or senior standing.* Goldman, Mathews, and McCabe

510 Bibliography and Literary Research *II, 3*

530 History of the English Language *I, 3*

531 History of Critical Theory *I, 3*

532 Modern Literary Criticism *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*

548 American Poetry to 1900 *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*

572 Spenser *II, 3*

573 Problems in Shakespeare *II, 3*

574 The Scots' Poetic Tradition through Robert Burns *I, 3*

575 Modern Southern Literary Renaissance *II, 3*

576 English Novel of the Eighteenth Century *I, 3*

577 English Novel of the Nineteenth Century *I, 3*

578 Problems in Milton *II, 3*

590 Selected Topics *I and II, 3*

EXPERIMENTAL STATISTICS (EST)

CHAIRMAN: Professor Hemmerle (Computer Science and Experimental Statistics)

220 Statistics in Modern Society *II, 3*
Elementary concepts in sampling, polls, surveys, random samples. Foundations of statistical inference; estimation, comparison prediction. Statistics for the consumer, quality of data, creditability of statistical evidence. Environmental measurements and experiments. *(Lec. 3)* Lawing

408 (411) 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 simple correlations. *(Lec. 3) Prerequisite: MTH 109.* Staff

409 (411) Statistical Methods in Research I *I, 3*
Same as EST 408, but for students who have better mathematical preparation. *(Lec. 3) Prerequisite: MTH 142.* Staff

412 Statistical Methods in Research II *II, 3*
Multiple linear regression and correlation analysis, curvilinear regression. Analysis of variance and covariance. Analysis of enumerative data. Some nonparametric methods. *(Lec. 3) Prerequisite: EST 408 or 409.* Carney and Hanumara

500 Nonparametric Statistical Methods *II, 3*

511 Linear Statistical Models *I, 3*

520 Fundamentals of Sampling and Applications *II, 3*

532 (or ASC 532) Experimental Design *II, 3*

541 Multivariate Statistical Methods *I, 3*

576 Econometrics I *I, 3*

577 Econometrics II *II, 3*

591, 592 Problems in Experimental Statics *I and II, 1-3 each*

FINANCE (FIN)

CHAIRMAN: Professor Poulsen

306 (OMR 306) Managerial Economics *II, 3*
Role of risk, product development, marketing and promotional policies, pricing, cost control, planning of capital expenditures, forecasting, the alternative nature of decision-making. *(Lec. 3) Prerequisite: ECN 126.* Staff

321 Fundamentals of Financial Management *I and II, 3*
Forms and sources of financing business firms, large and small, corporate and non-corporate. Emphasis is on financial planning and decision making. Financial policies are also considered in their social, legal and economic effects. *(Lec. 3) Prerequisite: ECN 123, 125 and 126, and ACC 202, MGS 202.* Staff

322 Investments *I, 3*
Problems of investing funds from point of view of individual and institutional investors. Basic principles of mechanics of investing, investment banking, investment counseling and evaluation of forecasting market trends. *(Lec. 3) Prerequisite: junior standing.* Pitterman

330 Problems in Financial Management *II, 3*
Computer assisted study of selected advanced problems in business finance. Case problems are also used. *(Lec. 3) Prerequisite: FIN 321.* Staff

332 Financial Institutions *I, 3*
Comprehensive analysis of American financial institutions, both private and governmental; their influence upon the operations of the economy; their relationships to the individual enterprise. Emphasis is on the internal problems of asset management of the institutions. Readings and cases. *(Lec. 3) Prerequisite: ECN 125 and 126, ACC 202 and MGS 202.* Staff

341 Fundamentals of Real Estate *I, 3*
Nature and importance of real estate; principles of land utilization, urban development, property rights, markets, government regulations. *(Lec. 3) Prerequisite: junior standing.* Staff

410 Capital Markets *I, 3*
Explanation, analysis, and clarification of the economic foundations on which money and capital markets are based. Factors of supply and demand for funds are analyzed. Emphasis is on all sources of long-term and short-term capital. *(Lec. 3) Prerequisite: FIN 332 or permission of instructor.* Staff

415 Working Capital Management *I, 3*
The role that working capital management makes upon corporate liquidity and profitability. *(Lec. 3) Prerequisite: FIN 321 and upper-class standing.* Staff

416 Intermediate Financial Management Theory *II, 3*
An analytical exposition concerning the problems of selecting and financing long-term investments. The application of mathematical and model building techniques to these problems is emphasized. *(Lec. 3) Prerequisite: FIN 321 and upper-class standing.* Staff

433 Bank Financial Management *I, 3*
The nature of the financial decisions facing the management of an individual bank. Current bank financial practices and research. A computer simulations exercise provides decision-making experience. Appropriate financial banking models considered. *(Lec. 3) Prerequisite: FIN 332 or permission of instructor.* Booth

440 Problems in Security Investments *II, 3*
Examination of specific industries, companies, and securities from the individual and institutional point of view. Techniques of investment analysis, management of risks, return on investment values. Annual reports and current cases will be used. *(Lec. 3) Prerequisite: FIN 422.* Pitterman

452 International Financial Management *II, 3*
Methods of financing multi-national corporations. Foreign exchange, international cash flow, multinational funds flow and international liquidity. Problems of international financial control. *(Lec. 3) Prerequisite: permission of instructor and junior or senior standing.* Staff

491, 492 Special Problems *I and II, 3 each*
Directed readings and research work involving financial problems under the supervision of a member of the staff. *Prerequisite: permission of instructor and junior or senior standing.* Staff

540 (940) Theory of Finance *I and II, 2*

FISHERIES AND MARINE TECHNOLOGY (FMT)

CHAIRMAN: Associate Professor Sainsbury

013 Shipboard Work I *I, 2*
Work aboard training vessels in port and at sea. Experience is gained in operating vessels, their equipment and principal methods of fishing. *(Lab. 6)* Sainsbury and Hillier

014 Shipboard Work II *II, 1*
Work aboard training vessels at sea and in port. Experience gained in rigging and working common gear

used in the commercial fishing industry. *(Lab. 3) Prerequisite: FMT 013.* Sainsbury

015 Shipboard Work III *I, 1*
Work aboard training vessels at sea and in port. Rigging, working and evaluation of fishing gear. *(Lab. 3) Prerequisite: FMT 014.* Hillier

110 Marine Technology *II, 5*
Application of basic physical principles of statics, dynamics, heat, light, sound, magnetism and electricity to problems encountered in vessel operation, fishing gear, navigation, fish finding, handling and storage of fish, engineering and electrical systems. *(Lec. 5)* Taber

113 Vessel Operations *I, 1*
Practical laboratory course in the conduct and handling of vessels and small craft with emphasis on procedures and seamanship for safe and efficient operation. Work consists of actual operations in port and at sea. *(Lab. 3) Prerequisite: permission of department.* Staff

118 Introduction to Commercial Fisheries *I, 4*
Commercial fisheries of the world, the United States and New England, including fishing grounds, resources, catch statistics and legislation. Introduction to fisheries biology with emphasis on the natural history of important commercial species and the food chain. Effect of fishing pressure and introduction to management of fishery resources. Utilization and principal catching methods for the various important commercial species, including vessels and gear. *(Lec. 4)* Meade and Sainsbury

121 Fishing Gear I *II, 3*
Detailed study of bottom and mid-water trawls and other dragging gear. Emphasis on construction, repair and use of different rigs and net designs, including the seine net. *(Lec. 2, Lab. 3) Prerequisite: FMT 013.* Hillier

131 Seamanship *II, 3*
Basic shipboard terminology and orientation. Safety at sea. Characteristics and use of rope and wire, tackles, gear systems, stress factors. Shipboard maintenance. Ship handling. International rules of the road. Knots, bends, hitches, rope and wire splicing. *(Lec. 2, Lab. 3)* Motte

222 Fishing Gear II *II, 3*
Detailed study of the purse seine, gillnet, trap and longline. Emphasis on the construction, repair and use of the various arrangements and designs of each. Brief treatments of other fishing methods. *(Lec. 2, Lab. 3) Prerequisite: FMT 121.* McCauley and Hillier

235 Fisheries Meteorology *I, 2*
Basic practical meteorology and weather forecasting for the mariner. The atmosphere, heat budget of the earth, hydrometeors. Fundamental pressure systems, air masses, formation of fronts and associated weather. Precursory signs, tracks and vessel conduct for tropical revolving storms. Ice, icebergs and icing-up conditions. World meteorological organization, coding and decoding of weather reports. *(Lec. 2) Not open to students who have taken GEG 403.* Motte

241 Marine Engineering Technology I *I, 4*
Diesel engine operation, maintenance, testing, timing, and overhaul. Basic principles of diesel designs in common use, including fuel systems, combustion chambers, piston and liner assemblies, camshafts and crankshafts, cooling systems, and lubrication systems. *(Lec. 3, Lab. 3)* McCauley

242 Marine Engineering Technology II *II, 4*
Introduction to hydraulics, including operation, maintenance, troubleshooting, installation and applications. Study of basic hydraulic systems, design of common hydraulic components, and selection of components for various applications. Study and application of mechanical and hydraulic diesel powered drive units. Layout and uses of shipboard water pumps. *(Lec. 3, Lab. 3)* McCauley

261 Marine Electronics *I, 3*
Basic electricity applied to fishing. Basic solid state and vacuum tube electronics, DC and AC machinery, ship wiring, communications, depth and fish finders, radar, electronic navigation systems. Noise control, siting and preventive maintenance of equipment. *(Lec. 2, Lab. 3)* Merriam

281 Navigation I *I, 4*
Fundamental rules and methods of chartwork. Chart projections and types. Position fixing, wind and tide allowance. Variation, deviation and compass error. Principle of transferred position line and doubling angle on the bow. Use of sextant angles, radar, hyperbolic, and celestial position lines for chartwork. Tidal theories and calculations involving parallel, plane and mercator sailings. *(Lec. 2, Lab. 4)* Motte

293 Fishing Operations Practicum *II, 1*
Practical fishing vessel operation; planning and working nearby fishing grounds for principal commercial species; rigging and handling gear and vessel. Conducted at sea in nearby waters. *(Pract. 3) Prerequisite: FMT 015, concurrent registration in FMT 192.* McCauley

351 (151) Fish Preservation *I, 4*
Introduction to microbiology and biochemistry of fish spoilage. Preservation methods at sea and ashore including icing, mechanical refrigeration, freezing, salting, smoking, dehydration, canning, plant sanitation and quality control. *(Lec. 3, Lab. 3) Prerequisite: permission of instructor.* Meade

371 (171) Ship Technology *II, 4*
Principles of naval architecture and ship construction applied to smaller vessels, with special emphasis on fishing craft. Basic ship geometry and calculations, stability, powering and propellers. Construction methods and materials, vessel planning. *(Lec. 3, Lab. 3)*

Prerequisite: MTH 109, PHY 111 or FMT 110, or permission of instructor. Sainsbury

382 (182) Navigation II *II, 3*
Elements of astronomy and spherical trigonometry applied to celestial navigation. Kepler's laws, the solar system, star recognition and study of time; the altitude/intercept method and sight reduction by various techniques. *(Lec. 2, Lab. 3) Prerequisite: FMT 281 or permission of instructor.* Motte

392 (192) Fishing Operations *II, 3*
Commercial fishing procedures as they relate to the vessel operator, in the use of navigation, engineering, vessel layout, economics, marketing, fishing gear, accounting, and on-board fish processing. *(Lec. 3) Prerequisite: FMT 281, 222, 118.* McCauley

416 Marine Transportation *II, 3*
Marine transport and the carriage of seaborne cargoes: trade and cargo patterns, ship types, international and governmental organizations, business, legal and insurance aspects, position of U. S. merchant marine, ports. *(Lec. 3) Prerequisite: permission of instructor. Offered in alternate years, next offered spring 1975.* Motte

452 Industrial Fishery Technology *II, 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) Prerequisite: permission of instructor.* Meade

FOOD AND NUTRITIONAL SCIENCE (FNS)

CHAIRMAN: Professor Dymsza

101 Introductory Food Study *I and II, 3*
Basic principles of food selection in today's market and preparation to retain maximum nutritive values and palatability. *(Lec. 2, Lab. 3)* Staff

207 General Nutrition *I and II, 3*
Fundamental concepts of science of nutrition with application to world, community and personal aspects. *(Lec. 3)* Staff

221 Meal Management *I and II, 3*
Managerial aspects of planning, preparing and serving food for family meals and special occasions. Food economics and problems of purchasing. *(Lec. 2, Lab. 3) Prerequisite: FNS 101.* Staff

331 Advanced Food Study *I, 3*
Application of principles, techniques, and advanced theory to selected problems of food preparation. *(Lec. 2, Lab. 3) Prerequisite: FNS 101, CHM 124.* Bacon

333 Quantity Food Production *I or II, 3*
Adaptation of recipes, use of equipment, and methods suitable for large quantity food preparation, with experience in cafeteria service and catering. *(Lec. 1, Lab. 4) Prerequisite: FNS 101, junior standing or permission of department. Next offered fall 1973.* Goshdigian

336 Demonstration Methods of Food and Equipment *II, 2*
Basic principles and techniques of demonstrations. Evaluation of the educational effectiveness of the presentations. *(Lab. 4) Prerequisite: permission of department.* Staff

337 Introductory Food Science *I, 3*
Survey of the basic principles of food science and technology. Technology of food products. Food utilization and the world food problem. *(Lec. 3) Prerequisite: 1 year of chemistry.* Constantinides

378 Sensory Evaluation of Foods
See Animal Science 378.

401, 402 Special Problems *I and II, 2-4 each*
Open to qualified seniors and graduate students who wish to do advanced work *(Lec. or Lab. according to nature of problem) Prerequisite: senior standing and permission of department.* Staff

438 Experimental Food Science *II, 3*
Principles and instrumentation techniques of basic and applied food research. Investigation of special food problems. *(Lec. 1, Lab. 6) Prerequisite: FNS 337 or permission of department.* Constantinides

441 Advanced Human Nutrition *I, 3*
Advanced study of principles of nutrition, factors affecting nutritional requirements and the role of nutrients in metabolic processes and in processed food products. *(Lec. 3) Prerequisite: FNS 207, biochemistry which may be concurrent, or permission of department.* Dymsza

444 Diet Therapy *II, 3*
Role of nutrition and diet in treatment of disease. *(Lec. 3) Prerequisite: FNS 441 or permission of department.* Staff

445 Readings in Nutrition *II, 2*
Reports and discussion of scientific developments. *(Lec. 2) Prerequisite: FNS 441 or permission of department.* Dymsza

451, 452 Field Experience in Food and Nutrition *I and II, 1-3*
Individual supervised field experiences and seminar in community, educational, government, health-oriented or commercial activities and services related to food and nutrition. *(Lec. and Lab.) Prerequisite: permission of department. Maximum total of 4 credits. Not for graduate degree program credit.* Goshdigian and Staff

502 Advanced Experimental Foods *II, 3*

503 Nutrition Research Methods *I, 3*

504 Food Science and Nutrition Seminar *II, 3*

505, 506 Marine Foods Seminar *I and II, 1 each*

531 Teaching of Nutrition *I or II, 3*

591, 592 Special Research Problems *I and II, 2-4 each*

FOOD AND RESOURCE CHEMISTRY (FRC)

CHAIRMAN: Professor Felbeck

411 (or PLS 411) Soil Chemistry and Fertilizers *1, 3*
Emphasis on laboratory analysis of soils. *(Rec. 2, Lab. 3, TBA). Prerequisite: junior standing, PLS 212 or equivalent. Quantitative analysis advised.* Staff

412 (or PLS 412) Soil Biochemistry *II, 3*
Origin, chemical and physical characteristics, and transformations of organic compounds and biological polymers in soils. Previous courses in organic chemistry and soils advised. *(Lec. 1, Lab. 6) Prerequisite: junior standing. In alternate years, next offered 1973-74.* Felbeck

431 Biochemistry of Foods *I, 3*
Introduction to food science with special emphasis on the chemistry and biochemistry of the essential components common to foods of plant and animal origin. *(Lec. 3) Prerequisite: organic chemistry.* Simpson and Rand

432 Biochemistry of Food Processing *II, 3*
Major emphasis on the problems of biochemical deterioration of foods and the principles of unit processes for the preservation of foods. Field trips and laboratory sessions will be scheduled. *(Lec. 2, Lab. 2) Prerequisite: organic chemistry.* Simpson and Rand

452 Plant Biochemistry *II, 3*
Basic course in the biochemistry of plant metabolism with emphasis on laboratory study of plant constituents. *(Lec. 2, Lab. 3, TBA) Prerequisite: organic chemistry and junior standing.* Salomon

491, 492 Special Projects *I and II, 3 each*
Advanced work under supervision of staff member. Arranged to suit individual requirements of student. *(Lab. 9) Prerequisite: permission of department.* Staff

501, 502 Seminar *I and II, 1 each*

521 Pesticide Chemistry *I, 3*

526 (or MCH 526) Lipid Chemistry *II, 3*

FOOD SERVICES (FDS)

CHAIRMAN: Professor Dymsza (Food and Nutritional Science)

335 Food Service Management *I or II, 3*
Job analysis, employee training, personnel relations, equipment requirements, and sanitation in institutional food service. *(Lec. 1, Lab. 4) Prerequisite: FNS 101 and junior standing or permission of department. Next offered spring 1974.* Goshdigian

336 Quantity Food Purchasing *I or II, 3*
Principles and methods of purchasing by specification, menu planning and cost analysis. Field trips required. *(Lec. 1, Lab. 4) Prerequisite: FNS 101 and junior standing or permission of department. Next offered fall 1974.* Staff

481, 482 Special Problems *I and II, 2-4 each*
Open to qualified seniors who wish to do advanced work. *(Lec. or Lab. according to nature of problem.) Prerequisite: senior standing and permission of department.* Staff

FOREST AND WILDLIFE MANAGEMENT (FOR)

CHAIRMAN: Associate Professor Gould

301, 302 General Forestry *I and II, 3 each*
Scope of forestry, professional opportunities, present forest conditions and problems. Small forest management covering identification and characteristics of Rhode Island forest trees, surveying and inventory of tracts, management of various Rhode Island timber types, forest protection and marketing of forest products. Laboratory includes field application of forest techniques. *(Lec. 2, Lab. 2) Prerequisite for 302: FOR 301.* Brown and Gould

305 General Wildlife Management *I, 3*
Introduction to wildlife management. Typical forest and farm game species are studied. Forest and farm habitats are analyzed and management techniques emphasized. *(Lec. 2, Lab. 2) Prerequisite: BOT 111, ZOO 111, or BIO 101 and 102.* Gould

306 General Wildlife Management *II, 3*
Continuation of FOR 305 with introductory wetlands management. Typical furbearers, waterfowl and fish. Emphasis on habitat management. *(Lec. 2, Lab. 2) Prerequisite: FOR 305.* Gould

390 Fresh Water Fishery Management Techniques *I, 3*
Basic theories, methods, purposes and problems in the management of fresh water fishery resources; life history and ecology of important game and commercial fishes, sampling methods, age and growth analysis, habitat evaluation and population estimates. *(Lec. 2, Lab. 3) Prerequisite: BIO 101, 102, BOT or ZOO 262, and permission of department.* Staff

401 Forest Influences *I, 3*
Effects of forest vegetation on local climate, the hydrologic cycle, soil, and man; relationships to water yield and runoff. Measurement of precipitation, runoff and other variables. *(Lec. 3) Prerequisite: junior standing; one course in field botany recommended. In alternate years, next offered 1973-74.* Brown

402 Wildlife Populations *II, 3*
Ecological presentation of the characteristics of exploitable animal populations and the mechanisms that regulate their numbers through time with a survey of methods used in wildlife population research. *(Lec. 2, Lab. 3) Prerequisite: ZOO 111 or BIO 102; ZOO 362 recommended. In alternate years, next offered 1973-74.* Kupa

421 The Wetland Environment *I, 3*
Characteristics and values of freshwater and saltwater wetlands. Survey of North American wetland environments, with emphasis on the Northeast. Man's use of wetlands; review of wetland legislation; evaluation of wetlands as wildlife habitat. *(Lec. 2, Lab. 3) Prerequisite: FOR 305 and either ESC 104, 105 or GEL 103; BOT 323 recommended.* Golet

491, 492 Special Projects *I and II, 1-3 each*
Special work to meet the needs of individual students in the fields of forestry and wildlife management. *(Lec. and/or Lab. according to nature of project.) Prerequisite: permission of department.* Staff

FRENCH (FRN)

SECTION HEAD: Assistant Professor Toloudis

101, 102 Elementary French *I and II, 3 each*
Fundamentals of grammar and pronunciation; exercises in reading, writing, and conversation. *(Lec. 3)* Staff

103, 104 Intermediate French *I and II, 3 each*
Development of facility in reading texts of moderate difficulty; supplemented by further work in grammar, conversation, and composition. *(Lec. 3) Prerequisite: FRN 102.* Staff

205, 206 Conversation and Composition *I and II, 3 each*
Emphasis on comprehension of spoken French, on 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) Prerequisite: FRN 104 or equivalent.* Staff

301, 302 The Civilization of France *I and II, 3 each*
A review of the geographical, historical, economic, social and esthetic factors contributing to the cultural development of France. *(Lec. 3) Prerequisite: for FRN 301, FRN 206; for FRN 302, FRN 301 or permission of department. Recommended for French majors in the General Teacher Education curriculum. In alternate years, next offered 1973-74.* Demers

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) Prerequisite: FRN 206 or equivalent.* Porter

306 Oral Expression in French *II, 3*
Designed to improve ability in conversation, discussion, short speech-making, pronunciation, everyday vocabulary. Deals with matters of current interest in France selected by instructor and students. *(Lec. 3) Prerequisite: FRN 206 or equivalent.* Staff

325 Introduction to Literary Forms *I, 3*
Studies in the novel, poetry, theatre and the essay. *Explication de texte* and short compositions. *(Lec. 3) Prerequisite: FRN 206. FRN 325 and FRN 206 may be taken concurrently by permission of instructor.* Staff

326 Introduction to Literary Movements *II, 3*
Evolution of literary movements from the Middle Ages to the present. *Explication de texte, exposés* and short compositions. *(Lec. 3) Prerequisite: FRN 206. FRN 326 and FRN 206 may be taken concurrently by permission of instructor.* Staff

391 Survey of French Literature from the Middle Ages *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) This course may not be taken for credit toward concentration requirements in French.* J. Hyland

392 Survey of Nineteenth-Century French Literature *I or II, 3*
Reading in translation of selected literary works from representative nineteenth-century authors. *(Lec. 3) This course may not be taken for credit toward concentration requirements in French.* J. Hyland

393 Survey of Twentieth-Century French Literature *I or II, 3*
Reading in translation of selected literary works from representative twentieth-century authors. *(Lec. 3) This course may not be taken for credit toward concentration requirements in French.* J. Hyland

402 French Phonetics *II, 3*
Introduction to articulatory phonetics and to phonetic notation; practical work on phonetic transcription. Rudiments of recognizing and reproducing French intonation patterns. Practical work in the language laboratory in phonetics and intonation. *(Lec. 3) Prerequisite: FRN 205 or permission of instructor. Not for graduate degree program credit in French. In alternate years, next offered 1974-75.* Rogers

411 Medieval Franch Literature *I, 3*
Readings of representative works of the late eleventh century through the fourteenth century. *(Lec. 3) Prerequisite: FRN 325 or 326 or permission of instruc-*

tor. Not for graduate degree program credit in French. Rogers

422 French Literature of the Renaissance *II, 3*
Historical study of the Renaissance in France as seen in representative writings of the fifteenth and sixteenth centuries. *(Lec. 3) Prerequisite: FRN 325 or 326 or permission of instructor. Not for graduate degree program credit in French.* Benson

431, 432 French Literature of the Seventeenth Century *I and II, 3 each*
Special attention to principal literary movements of the century as illustrated by leading writers of the period. *FRN 431:* theatre of Corneille, Racine and Molière. *FRN 432:* the Moralistes and other representative writers. *(Lec. 3) Prerequisite: FRN 325 or 326 or permission of instructor. Not for graduate degree program credit in French.* Morello

441, 442 French Literature of the Eighteenth Century *I and II, 3 each*
Special attention to principal literary movements of the century as illustrated by leading writers of the period. *(Lec. 3) Prerequisite: FRN 325 or 326 or permission of instructor. Not for graduate degree program credit in French. In alternate years, next offered 1973-74.* Rothschild

451 Romanticism *I, 3*
General survey of Romantic poets and prose writers. Authors studied are Chateaubriand, Constant, Lamartine, Musset, Vigny, Hugo. *(Lec. 3) Prerequisite: FRN 325 or 326 or permission of instructor. Not for graduate degree program credit in French.* Toloudis

452 Realism and Symbolism *II, 3*
Realist and Symbolist movements of the nineteenth century. Writers usually read are Balzac, Stendhal, Flaubert, Zola, Baudelaire, Verlaine, Rimbaud, Mallarmé. *(Lec. 3) Prerequisite: FRN 325 or 326 or permission of instructor. Not for graduate degree program credit in French.* Chartier

461 Drama of the Twentieth Century *I, 3*
Representative dramatists. *(Lec. 3) Prerequisite: FRN 325 or 326 or permission of instructor. Not for graduate degree program credit in French.* Waters

462 Poetry of the Twentieth Century *II, 3*
Representative poets of the period. *(Lec. 3) Prerequisite: FRN 325 or 326 or permission of instructor. Not for graduate degree program credit in French.* Staff

463 Twentieth-Century Prose through 1950 *I, 3*
Special emphasis on the novelists of that period. *(Lec. 3) Prerequisite: FRN 325 or 326 or permission of instructor. Not for graduate degree program credit in French.* Demers

464 Twentieth-Century Prose since 1950 *II, 3*
Special emphasis on the *nouveau roman. (Lec. 3) Prerequisite: FRN 325 or 326 or permission of instructor. Not for graduate degree program credit in French.* Demers

471 Black French Prose and Poetry *I or II, 3*
Sub-Saharan and Caribbean French language authors such as Senghor, Cesaire, Rabemananjara, Ouologuem and Kourouma. *(Lec. 3) Prerequisite: FRN 325 or 326 or permission of instructor. Not for graduate degree program credit in French.* Waters

472 Black and Arab French Theatre *II, 3*
French-language plays by authors of the Maghrib, the sub-Sahara, and the black diaspora. *(Lec. 3) Prerequisite: FRN 325 or 326 or permission of instructor. Not for graduate degree program credit in French.* Waters

497, 498 Directed Study *I and II, 3 each*
Designed particularly for the advanced student. Individual research and reports on problems of special interest. *Prerequisite: acceptance of a project by a member of the staff and departmental approval. Not for graduate degree program credit.* Staff

501 Advanced Composition *I, 3*

502 Stylistics *II, 3*

503, 504 History of the French Language *I and II, 3 each*

511, 512 French Literature of the Middle Ages *I and II, 3 each*

521 The French Renaissance *I, 3*

522 The Rise of Introspective Writings in Sixteenth-Century France *II, 3*

531 The Tragic Theatre of the Seventeenth Century *I, 3*

532 The Comic Theatre of the Seventeenth Century *II, 3*

541 The Age of Enlightenment *II, 3*

542 The Theatre of the Eighteenth Century *I, 3*

543 The Novel of the Seventeenth and Eighteenth Centuries *I, 3*

551 The Romantic Movement *I, 3*

552 Realism and Naturalism *I, 3*

553 The Symbolist Movement *I, 3*

561 Contemporary French Theatre through 1950 *I and II, 3*

562 French Theatre since 1950 *II, 3*

563 The Novel of the Twentieth Century *I, 3*

591 Proust and Claudel *II, 3*

594 Special Problems *I and II, 3*

GENERAL BUSINESS ADMINISTRATION (GBA)

CHAIRMAN: Professor Coates (Organizational Management and Industrial Relations)

110 Introduction to Business *I and II, 3*
Nature, philosophy, objectives, and scope of the American business system. Emphasis on the interrelations of the functional areas. *(Lec. 3) Limited to students in the Fisheries and Marine Technology program.* Staff

410 Business Policy *II, 3*
Analysis of the problems of top management and integration of all areas in the business curriculum into management decision making. Conducted primarily on a case method basis. *(Lec. 3) Prerequisite: senior standing.* Staff

GENETICS

COORDINATOR: Assistant Professor Mottinger

Animal Science
352 General Genetics
354 Genetics Laboratory
470 Population Genetics

Botany
352 General Genetics
354 Genetics Laboratory
554 Cytogenetics
579 Advanced Genetics Seminar

Microbiology
552 Microbial Genetics

Plant and Soil Science
472 Plant Improvement

Zoology
471 Evolution
476 Human Genetics
576 Ecological Genetics
579 Advanced Genetics Seminar

GEOGRAPHY (GEG)

CHAIRMAN: Professor Alexander

Note: For additional courses: see Earth Science.

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)* Higbee

103 Economic Geography *I and II, 3*
Surveys the geographic backgrounds of economic activities. Populations and the resources of agriculture, industry, and commerce are studied in terms of their world and regional distribution. *(Lec. 2, Rec. 1)* Capelle

104 Geographical Earth Science *I and II, 4*
See Earth Science 104.

121 Cultural Geography *I and II, 3*
Introductory survey of cultural variations in the spatial organization of man's total environment. Attention to developmental processes affecting contemporary spatial patterns in agrarian and urban settings with emphasis on non-Western experiences. *(Lec. 3)* Brand

131 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

403 Meteorology and Climatology I *I, 3*
Introduction to the basic meteorological processes, their spatial and temporal variations. Energy and moisture budgets at the surface of the earth. *(Lec. 3) Prerequisite: ESC 104 or permission of department.* Havens

404 Meteorology and Climatology II *II, 3*
Selected topics in climatic classification, regional climate, micro-climatology, climatic change, and applied aspects of meteorology and climatology. *(Lec. 3) Prerequisite: GEG 403.* Havens

407 Selected Topics in Meteorology *II, 2*
Seminar, with each student exploring in depth some topic in meteorology germane to his particular interests. *(Lec. 2) Prerequisite: GEG 403 or equivalent.* Staff

411 Urban Geography *I, 3*
Growth and spatial organization of urban places at macro- and micro-regional scales of investigation in cross-cultural contexts. Emphasis on evolution of internal socio-cultural patterns and on the role of urbanization in modernization processes. *(Lec. 3) Prerequisite: one 100-level geography course or permission of department.* Brand

412 Seminar in Urban Geography *I and II, 3*
Urban patterns, their development, sizes, spacing, structure, and relationship to the global urban network. Emphasis on the urban environment as a context for geographic studies. *(Lec. 3) Prerequisite: GEG 100 or permission of department.* Higbee

421 Introductory Cartography *I and II, 3*
Compilation, design, and interpretation of maps. Practice in drawing maps and in cartographic use of statistical materials. *(Lec. 2, Lab. 3)* Staff

422 Advanced Cartography *II, 3*
Elementary photogrammetry, uncontrolled mosaics, and photo interpretation with an emphasis on the use of aerial photographs to supplement and simplify field research. Techniques for the automated graphic display of quantitative geographic information on the printer and increment plotter; interpolation algorithms; introduction to automated map interpretation. *(Lec. 2, Lab. 3) Prerequisite: GEG 421 or 6 credits in computer science, or permission of department.* Staff

432 Seminar in Political Geography *II, 3*
Special problems of territorial control, including the changing nature of international boundaries, elements of unity and diversity within nations, and concepts of geopolitics. *(Lec. 3) Prerequisite: GEG 131 or permission of department.* Alexander

441 Geography of Europe *I, 3*
Physical and cultural elements of Europe, excluding the Soviet Union, with special emphasis on economic and political aspects of individual countries since World War II. *(Lec. 3) Prerequisite: GEG 103, 131, or permission of department.* Michel

442 Geography of the Soviet Union *I, 3*
Physical, economic, ethnographic, and political bases of Soviet Union. Problems of Soviet industrial and agricultural development. Changing patterns of settlement. *(Lec. 3) Prerequisite: ESC 104 and 105, or permission of department. In alternate years, next offered 1973-74.* Michel

443 Geography of the United States and Canada *II, 3*
Survey of geographic regions of United States and Canada, emphasizing interdependence of these regions and their potentials for future economic development. *(Lec. 3) Prerequisite: GEG 100 or permission of department.* Higbee

444 Geography of the Middle East and the Indian Subcontinent *II, 3*
Regional analysis of the lands and peoples from Egypt to Bangladesh, with emphasis upon the geographical problems of the modern states including boundary and water disputes, resource base, and economic development. *(Lec. 3) Prerequisite: ESC 104 and 105, or GEG 103, 121 or 131, or permission of department.* Michel

445 Geography of Modernization in Africa *II, 3*
Systematic survey of spatial aspects of the modernization process. Constraints and potentialities present in contrasting environmental-cultural complexes. Selective coverage of developmental processes active in explaining contemporary patterns of social and economic occupancy. *(Lec. 3) Prerequisite: one 100-level geography course or permission of department.* Brand

446 Geography of the Polar Regions *II, 3*
Systematic and regional surveys of the physical and biological environments of the Arctic and sub-Arctic. Recent contributions to the geography of the Antarctic. *(Lec. 3) Prerequisite: ESC 104 or permission of department.* Havens

451 Land Utilization *I, 3*
Physical differences in land quality and the various functions of land in the modern community. Consideration given to the principles of land planning for effective use and conservation in rural and urban areas. *(Lec. 3) Prerequisite: ESC 104.* Higbee

452 Transportation Geography *II, 3*
Passenger and commodity transportation. Analysis of the relationship between transportation services and the spatial distribution of activities. Emphasis on location theory, analytical methodologies, and urban transportation problems. *(Lec. 3) Prerequisite: one 100-level geography course or permission of department.* Capelle

463 Geography of World Resources *II, 3*
Distribution, development, and rational utilization of the world's biological, mineral and energy resources, including the resources of the sea and sea bottom. *(Lec. 3) Prerequisite: GEG 103 or permission of department.* Staff

491, 492 Special Problems in Geography *I and II, 3 each*
Individual guidance in major readings in geography and methods of geographic research. *(Lec. 3) Prerequisite: permission of department.* Staff

502 Research Methods in Geography *I, 3*

526 Plant Geography *I, 3*

542 Seminar in Economic Geography *I, 3*

543 Geography of Megalopolis *I, 3*

544 Historical Geography of the United States *I, 3*

545 Geography of the North Atlantic Basin *II, 3*

571 Marine Geography *I, 3*

591, 592 Directed Study or Research *I and II, 3 each*

595 Problems of Modernization in Developing Nations *II, 3*

GEOLOGY (GEL)

CHAIRMAN: Professor J. A. Cain

Note: For additional courses, see Earth Science.

103 Physical Geology *I, 3*
Introduction to the study of earth, its composition, development, and destruction in relation to natural processes and phenomena acting upon it. Laboratory includes introduction to study of minerals and rocks, their physical properties and mode of origin, and introduction to geologic and topographic map interpretation. *(Lec. 2, Lab. 2) This course followed by GEL 104 can satisfy the B.A. and B.S. curriculum requirements for 1 year of physical science.* Fisher and Hermes

104 Historical Geology *II, 3*
Development of continents and ocean basins, method of preservation of fossils, their classification, and introduction to study of fossil plants and animals. *(Lec. 2, Lab. 2) Prerequisite: GEL 103 or permission of instructor.* Tynan

105 Geological Earth Science
See Earth Science 105.

106 Geological Earth Science Laboratory
See Earth Science 106.

301 Geology of Mineral Resources *I, 3*
Origin and distribution of various mineral resources such as metals, coal, petroleum, natural gas, building and industrial materials. Strategic minerals, their world distribution and part played in world affairs. *(Lec. 3) Prerequisite: GEL 103 or 302, or ESC 105 and 106 or permission of instructor. Offered in fall of even calendar years.* Cain

302 Engineering Geology *II, 3*
Introduction to principles of geology, and a consideration of geologic problems confronting civil engineers. General characteristics of common mineral and rock types, rock deformation, coastal and river processes, earthquakes, groundwater, etc. *(Lec. 3)* Hampton

410 Geomorphology *I, 3*
Introduction to classification of landforms, their development, distribution and associated geologic processes. Cycles of development of coastal, glacial and fluvial landforms. Laboratory includes landform analysis of topographic maps and aerial photographs. Field trips illustrate both local and regional geomorphic features. *(Lec. 2, Lab. 3) Prerequisite: ESC 104 and GEL 103 and 104, or ESC 104, 105 and 106, and permission of instructor.* Fisher

420 Mineralogy *I, 3*
Systematic study of crystallography, morphology, and the physical properties of minerals as related to their crystal structure and chemical composition. Laboratory study of crystal morphology and identification of the most common and geologically important minerals. *(Lec. 2, Lab. 3) Prerequisite: GEL 103 or ESC 105 and 106, PHY 112 or 214, and CHM 101 or 103, or permission of instructor.* Hermes

421 Optical Mineralogy *II, 3*
Elementary study of the optical properties of minerals and their identification using the polarizing microscope. The latter part of the course will consist of a systematic survey of the major rock-forming minerals and their identification by optical techniques. *(Lec. 2, Lab. 3) Prerequisite: GEL 420 or permission of instructor.* Hermes

425 Principles of Geochemistry *I, 3*
Applications of basic chemical concepts to geological problems. Topics include historical geochemistry, crystal chemistry, the phase rule, geochemistry of natural rock systems, isotope geochemistry, distribution of the elements, and geochemical cycles. *(Lec. 3) Prerequisite: GEL 420, CHM 112, 114 (may be taken concurrently) or permission of instructor. Offered in fall of even calendar years.* Hermes

430 Petrology *II, 3*
Composition, classification and genesis of igneous, sedimentary and metamorphic rocks. Interpretation of mineral assemblages and textures in both hand specimen and thin section. *(Lec. 2, Lab. 3) Prerequisite: CHM 112, 114, GEL 421 (may be taken concurrently) or permission of instructor.* Cain

440 Introduction to Paleontology *I, 3*
History, methods, nature and problems. Systematic survey of animal organisms found as fossils with particular emphasis on their morphology, taxonomy and geologic distribution. *(Lec. 2, Lab. 3) Prerequisite: GEL 104 or ESC 105 and 106, ZOO 111 or BIO 102, or permission of instructor.* Tynan

450 Introduction to Stratigraphy and Sedimentation *I, 3*
Introduction to the principles underlying the formation, composition, sequence, and correlation of stratified rocks. Methods, procedures and techniques of studying sedimentary processes, sedimentary environments, stratigraphic relationships, and stratigraphic correlation. *(Lec. 2, Lab. 3) Prerequisite: GEL 103 and 104 or ESC 105 and 106, or permission of instructor.* Hampton

465 Introduction to Geophysics *II, 3*
Introduction to the physical properties of the earth, its interior, and the forces shaping the major tectonic structures. Primarily solid state geophysics relating to earth's crust, gravity, the earth's core, geomagnetism, earthquakes and seismology. Field application of instrumental geophysical exploration techniques. *(Lec. 2, Lab. 3) Prerequisite: GEL 103 or*

ESC 105 and 106, PHY 112 or 214, and 286, or permission of instructor. Offered in spring of odd calendar years. Staff

470 Structural Geology *II, 3*
Stress and strain relationships as they pertain to rocks. Manifestations of these phenomena in geologic structures and criteria for recognizing them. *(Lec. 2, Lab. 3) Prerequisite: GEL 103 and 104, or ESC 105 and 106, PHY 213 and 285 or 111, or permission of instructor.* Hampton

490 Senior Thesis *I and II, 3*
Introduction to independent research. Student will select an area of study and will work in close conjunction with a faculty member of his own choice. *(Lab. 6) Prerequisite: senior standing and permission of instructor. Not for graduate degree program credit.* Staff

510 Coastal Geomorphology *II, 3*

526 Igneous and Metamorphic Geochemistry *II, 3*

530 Igneous Petrology *I, 3*

531 Metamorphic Petrology *II, 3*

541 Animal Micropaleontology *II, 3*

542 Plant Micropaleontology *I, 3*

550 Sedimentation *I, 3*

551 Sedimentary Petrology *II, 3*

555 Stratigraphy *II, 3*

561 Evaluation of Geologic Data *I, 3*

581 (or OCE 581) Coastal Engineering Geology *II, 3*

585 Geohydrology *I, 3*

590 Special Problems *I and II, 1-3*

GERMAN (GER)

SECTION HEAD: Professor B. A. Woods

101, 102 Elementary German *I and II, 3 each*
Fundamentals of grammar and pronunciation; exercises in reading, writing, and conversation. *(Lec. 3)* Staff

103, 104 Intermediate German *I and II, 3 each*
Development of facility in reading narrative and expository prose; exercises in grammar, listening comprehension, and speaking. *(Lec. 3) Prerequisite: GER 102 or equivalent.* Staff

111, 112 Intensive German I, II *I and II, 5 each*
Essentials of grammatical structure; intensive drill in pronunciation and intonation, exercises in basic conversational skills. *(Lec. 5) Not open to students who have prior credit or concurrent registration in GER 101, 102.* Staff

113, 114 Intensive German III, IV *I and II, 4 each*
Development of facility in reading narrative and expository prose; review exercises in grammatical structure; intensive practice in conversational skills. *(Lec. 4) Prerequisite: GER 112 or equivalent. Not open to students who have prior credit or concurrent registration in GER 103, 104.* 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) Prerequisite: GER 104 or equivalent.* Staff

325, 326 Introduction to Modern German Literature *I and II, 3 each*
Literary appreciation of German narrative, drama and lyric poetry by leading writers from 1885 to the present. *(Lec. 3) Prerequisite: GER 104 or equivalent.* B. A. Woods

391, 392 Masterpieces of German Literature *I and II, 3 each*
GER 391: Literary works from the Middle Ages through 1800 in English translation. *GER 392:* Literary works from 1800 to the present in English translation. *(Lec. 3) May not be used toward a concentration in German.* Kalinke and Grandin

409 History of the German Language *I, 3*
Development of the German language from early Germanic to modern German. Emphasis on cultural influences on linguistic change. *(Lec. 3) Prerequisite: GER 206 or permission of instructor. In alternate years, next offered 1973-74.* F. L. Woods

431 German Literature from 800 to 1700 *II, 3*
Literary works from the Old High and Middle High German periods through the age of Baroque. Readings in modern German. *(Lec. 3) Prerequisite: GER 206 or equivalent. In alternate years, next offered 1973-74.* Kalinke

441, 442 German Literature of the Eighteenth Century *I and II, 3 each*
Special attention to principal literary movements of the century as illustrated by leading writers of the time. *(Lec. 3) Prerequisite: GER 206 or equivalent. In alternate years, next offered 1974-75.* Grandin

451, 452 German Literature of the Nineteenth Century *I and II, 3 each*
Special attention to principal literary movements of the century as illustrated by leading writers of the time. *(Lec. 3) Prerequisite: GER 206 or equivalent. In alternate years, next offered 1973-74.* Dornberg

481 The German Lyric *I, 3*
Intensive study of the German lyric from the seventeenth century to the present. *(Lec. 3) Prerequisite: GER 206 or equivalent. In alternate years, next offered 1973-74.* B. A. Woods

482 German Drama *I, 3*
Works and theories of representative German dramatists from the seventeenth century to the present. *(Lec. 3) Prerequisite: GER 206 or equivalent. In alternate years, next offered 1974-75.* Dornberg

483 German Narrative *II, 3*
Narrative prose in German literature from the eighteenth century to the present, including the novel, the novelle, and short stories. *(Lec. 3) Prerequisite: GER 206 or equivalent. In alternate years, next offered 1974-75.* Grandin

497, 498 Directed Study *I and II, 3 each*
Designed particularly for the advanced student. Individual research and reports on problems of special interest. *Prerequisite: acceptance of a project by a member of the staff and departmental approval.* Staff

GREEK (GRK)

SECTION HEAD: Assistant Professor Cashdollar

101, 102 Introductory Greek *I and II, 3 each*
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)* Cashdollar

201, 202 Intermediate Greek *I and II, 3*
Reading and study of texts of classical authors. *(Lec. 3) Prerequisite: GRK 102 or equivalent.* Cashdollar

HISTORY (HIS)

CHAIRMAN: Professor Findlay

101 History of Western Civilization to 1715 *I and II, 3*
Introductory course treating Western history in its broadest sense from the Egyptian civilization through the era of Louis XIV. *(Lec. 3)* Staff

102 History of Western Civilization since 1715 *I and II, 3*
Continuation of HIS 101: Western history to the present time. *(Lec. 3)* Staff

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

112 History of Medieval Europe *II, 3*
Primary western Europe. Follows HIS 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

115 Introduction to Western Cultural History *I or II, 3*
Survey of the intellectual and cultural history of the Western world from the Renaissance to the present. *(Lec. 3) Not open to students who have passed HIS 102.* Staff

121 History of England to 1500 *I, 3*
England from the Roman Occupation with emphasis on Norman Conquest, feudalism and subsequent political, legal, economic, intellectual, artistic, and social developments. *(Lec. 3)* Staff

122 History of England since 1500 *I or II, 3*
Continuation of HIS 121 with emphasis on constitutional conflicts and developments, commerce, agricultural and industrial revolutions, artistic, intellectual, and social developments. *(Lec. 3) HIS 121 not prerequisite for HIS 122.* Gutchen

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

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

142 History of the United States since 1877 *I or II, 3*
General social, economic and political development to the present. *(Lec. 3)* Staff

145 Women in American History *I or II, 3*
Survey of 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

147 History of American Foreign Relations *I or II, 3*
Introductory survey of the diplomatic history of the United States from the American Revolution to the present. Main currents of American diplomacy with special emphasis on the role of public opinion in the development of foreign policy. *(Lec. 3)* Staff

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)* Staff

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 these aspects relate to and influence contemporary developments. *(Lec. 3)* Kim

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)* Roughton

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)* Roughton

180 Introduction to Latin American Civilization *I or II, 3*
Survey of the social, cultural and political history of the Latin American region from the pre-conquest era to the present time. *(Lec. 3)* Bryan

325 History of European Socialism *I, 3*
The historical development of socialism in Europe since the beginning of the Industrial Revolution, with emphasis on socialist movements and ideologies in Germany, France, Russia and England. *(Lec. 3) Prerequisite: sophomore standing. HIS 102 advisable.* Honhart

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.) Prerequisite: permission of department.* Staff

394 History as a Discipline *I or II, 3*
An introduction to the philosophy and history of history, the relation of history to other disciplines. *Prerequisite: junior standing.* Staff

395 Seminar in History *I or II, 3*
Introduction to historical research and writing. Topics vary. Required for history concentration. *Prerequisite: permission of department.* Staff

401 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

402 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

403 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

404 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

405 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

406 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 upon cultural and artistic developments. *(Lec. 3)* Daniel

408 History of Europe, 1648-1789 *I, 3*
Survey of the European states from the Peace of Westphalia to the French Revolution. Emphasis on relationship among social and economic conditions and political development. *(Lec. 3)* Silvestri

409 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 of interpretation. *(Lec. 3)* Silvestri

410 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 with emphasis upon the Revolutions of 1848, the unification of Italy and Germany, the impact of the Industrial Revolution, nationalism and imperialism, and the background of World War I. *(Lec. 3)* Thomas

411 History of Europe since 1914 *II, 3*
Detailed study of developments from 1914 to the present: the wars, the post-war adjustments, the communist and fascist ideologies, the history of individual states, and social and intellectual trends. *(Lec. 3)* Thomas, Silvestri, Honhart

414 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

415 Nineteenth- and Twentieth-Century European Cultural History *II, 3*
Intellectual and cultural movements from Romanticism through Existentialism. *(Lec. 3)* Honhart and Thurston

416 History of Science to 1700 *I, 3*
Survey of the genesis and development of scientific thought, the formation of the scientific community, and the cultural influences of science from the Greeks to 1700. *(Lec. 3)* Briggs

417 History of Science since 1700 *II, 3*
Continuation of HIS 416 from about 1700 to the present. *(Lec. 3)* Briggs

418 Diplomatic History of Europe since 1815 *I, 3*
Materials used in writing diplomatic history, review of the major crises with their causes and consequences, and movements for the collective security. *(Lec. 3) Prerequisite: HIS 102 or permission of instructor.* Thomas

426 German History,1640-1871 *I, 3*
Rise of Brandenburg-Prussia from the time of the Great Elector to the unification of Germany under Bismarck's aegis in 1871, with the emphasis on political and cultural history. *(Lec. 3)* Honhart

427 German History since 1871 *II, 3*
Rise and fall of the Second and Third Reich from the unification in 1871 to the present split between the Federal Republic of (West) Germany and (East) German Democratic Republic, with emphasis on political and cultural history. *(Lec. 3)* Honhart

430 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

432 History of Russia to 1917 *I, 3*
Russian origins in medieval Kiev and the rise of autocracy in Muscovy. Imperial Russia's development in the eighteenth and nineteenth centuries. Emphasis on social and cultural change. *(Lec. 3). Prerequisite: HIS 101 and 102 or permission of department, junior standing or above.* Thurston

433 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) Prerequisite: HIS 102.* Thurston

435 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) Prerequisite: HIS 141 or equivalent.* Metz

436 The American Revolution and Confederation, 1763-1789 *I, 3*
Social, political and economic aspects of the Revolution and Confederation periods. *(Lec. 3) Prerequisite: HIS 141 or permission of instructor.* Cohen

437 The United States during the Early National Period, 1789-1850 *II, 3*
American history from the Constitution through the Federalist, Jeffersonian, and Whig periods with emphasis upon political developments and social and economic aspects of the era. *(Lec. 3) Prerequisite: HIS 141 or permission of instructor.* Cohen

439 Emergence of Industrial America, 1877-1917 *I, 3*
Emphasis upon the growth and consolidation of business, urbanization and the Populist and Progressive movements. Some consideration of America's emergence as a world power. *(Lec. 3) Prerequisite: HIS 142 or permission of instructor.* Klein and Findlay

440 United States History from 1917 to 1945 *I or II, 3*
Social, political, and economic developments between the World Wars. Emphasis upon domestic affairs but special attention given to the involvement of the United States in World War II. *(Lec. 3)* Klein and Findlay

441 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

442 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)* Metz

443 Social and Intellectual History of the United States, 1865 to the Present *II, 3*
Social and intellectual development after the Civil War, including literary, artistic, scientific trends, with particular attention to the interaction between concepts and institutions during periods of social reform. *(Lec. 3) Prerequisite: HIS 142 or permission of instructor.* Klein

445 History of the Negro Peoples *II, 3*
Survey of the history of the Negro peoples in the United States and Africa in the modern period. Emphasis upon the links between the "New World" Negro and the African; comparative slave systems and the history of racist ideology. *(Lec. 3) Prerequisite: junior standing.* Weisbord

448 American Social Reform *II, 3*
Comparative study of the history of American social reform. *(Lec. 3)* Strom

450 Constitutional History of the United States *II, 3*
The origins, framing and development of the Constitution of the United States with particular attention to the social and economic influences that have shaped our form of government and our attitudes toward it. *(Lec. 3) Prerequisite: HIS 141 and 142.* Metz

453 (452) United States Diplomatic History to 1914 *I, 3*
The foreign relations of the United States from colonial times to the beginning of World War I. *(Lec. 3) Prerequisite: junior standing.* Staff

454 United States Diplomacy in the Twentieth Century *II, 3*
American foreign relations since the emergence of

the United States as a world power. *(Lec. 3) Prerequisite: junior standing.* Staff

457 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

462 History of Rhode Island *II, 3*
History of Rhode Island from the first English settlement to the present day. Attention will be given to social, political, and economic aspects of internal development and to the relation of the state to the region and the nation. *(Lec. 3) Prerequisite: HIS 141 and 142.* Metz

465 (438) The Civil War in America *I, 3*
Emphasis on the polarization of American society between 1830 and 1865 and the effects of the Civil War on the American political economy. *(Lec. 3)* Strom

466 Reconstruction in America *II, 3*
Origins of Reconstruction policies during the Civil War, the emergence of the Radical Republicans and the effects of war and Reconstruction on the peoples of the southern states through 1890. *(Lec. 3)* Strom

469 (407) 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 crisis upon culture and society. *(Lec. 3)* Daniel

470 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

471 History of the Far East: Classical Period *I, 3*
Survey of the classical civilizations of China, Japan, and Korea during the period up to the arrival of European power in Eastern Asia. *(Lec. 3)* Kim

472 History of the Far East: Modern Period *II, 3*
Modern history of the Far East. An analysis of the reaction of China, Japan, and Korea to the challenge presented to them by the Western powers, tracing the growth of these nations into modern powers. *(Lec. 3)* Kim

473 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

474 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

477 Southwest Asia and North Africa since 1683 *II, 3*
Southwest Asia and North Africa from the second siege of Vienna. Transformation of Ottoman and Iranian societies under the influence of Western ideas and institutions. Development of Arab, Turkish, and Iranian nationalisms. *(Lec. 3) Prerequisite: junior standing or permission of instructor.* Roughton

479 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) Prerequisite: junior standing or permission of instructor.* Roughton

481 History of Colonial Latin America *I, 3*
The European background, native cultures, conquest and settlement of Latin America, together with political, economic and social development of the area, concluding with wars for independence. *(Lec. 3)* Bryan

482 History of Modern Latin America *II, 3*
Continuation of HIS 481, covering Latin American history from independence to the present time. *(Lec. 3)* Bryan

483 History of Modern Mexico *I or II, 3*
An analysis of the social, economic and political development of Mexico from 1810 to the present, emphasizing the Revolution of 1910, its background and aftermath. *(Lec. 3)* Bryan

488 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) Prerequisite: junior standing.* Weisbord

493, 494 Topics in History *I and II, 3 each*
Subject, course content, and years offered will vary according to expertise and availability of instructors. With departmental permission can be taken more than once.

501 Colloquium in European History *I or II, 3*

515 Seminar in Twentieth-Century Diplomacy *II, 3*

521, 522 Readings and Research in European History *I and II, 3 each*

535 Colloquium in American History *I or II, 3*

540 Seminar in American Colonial History: The Seventeenth and Eighteenth Centuries *I or II, 3*

541 Seminar in Nineteenth-Century American History *I and II, 3*

542 Seminar in Twentieth-Century United States History *I and II, 3*

543 Seminar in the History of the United States, Foreign Relations *II, 3*

550 Seminar in Black Nationalism and the International Race Problem *I or II, 3*

560 Research in Local History *II, 3*

580 Colloquium in Latin-American History *I or II, 3*

591 Directed Study of Research *I and II, 3*

593 Seminar in Historical Studies *I and II, 3*

HOME MANAGEMENT (HMG)

CHAIRMAN: Professor E. Crandall

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) Prerequisite: sophomore standing or permission of department.* Crandall

320 Family Economics *I and II, 3*
Factors affecting family financial decisions and their effect upon the individual family and the community. *(Lec. 3) Prerequisite: HMG 210 or permission of department.* Goertz

340 Family Housing *I and II, 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) Prerequisite: HMG 210 or permission of department.* Noring

350 Household Equipment *I, 3*
Fundamental principles and management involved in selection, use and care of household equipment, and related utilities. *(Lec. 2, Lab. 2)* Goertz

370 Home Management Residence *I and II, 3*
Residence in the Home Management Center with experience in group relationships, application of managerial principles, and solving managerial problems. *Prerequisite: HMG 210 and FNS 101.* Noring

371 Seminar in Home Management *I and II, 3*
The application and analysis of concepts of management in established households. Parallels HMG 370. *Prerequisite: HMG 210, FNS 101, and open to married students only.* Noring

401 Home Management Problems of Deprived Families *II, 3*
Seminar in understanding and assisting families faced with managerial problems due to social and economic deprivation. Some field experience provided. *(Lec. 3) Prerequisite: HMG 320 and SOC 202 or permission of department.* Goertz

470 Special Problems in Home Management *I and II, 2-4*
Special problems to be selected from the areas of home management theory, consumption economics, work simplification, and equipment depending upon the specific interest of the student. *(Lab. TBA)* Staff

570 Special Problems in Home Management *I, 3*

575 Presentation of Home Management Principles *II, 3*

HONORS COLLOQUIUM (HCL)

COORDINATOR 1973-74: Leon F. Bouvier

401 Honors Colloquium I *I and II, 3*
Independent study, discussions, faculty conferences and attendance at Honors Colloquium Distinguished Lecture Series. Colloquium theme changes each year. Enrollment limited to University Honors Program students.

402 Honors Colloquium II *I and II, 3*
Same as HCL 401. *Prerequisite: HCL 401.*

403 Honors Colloquium III *I and II, 3*
Same as HCL 401. *Prerequisite: HCL 402.*

404 Honors Colloquium IV *I and II, 3*
Same as HCL 401. *Prerequisite: HCL 403.*

INDUSTRIAL ENGINEERING (IDE)

CHAIRMAN: Professor C. F. James

220, 221 Industrial Engineering I, II *I and II, 3 each*
Introduction to industrial engineering. Elementary topics in production control, inventory control, forecasting, motion and timestudy, methods analysis. Elementary operations research and quantitative techniques. Depreciation, obsolescence, time value of money, and other topics in engineering economics related to the selection and replacement of capital equipment and evaluation of project proposals. *(Lec. 3) Prerequisite: MTH 142; for IDE 220, credit or registration in CSC 201; for IDE 221, IDE 220.* Staff

330 Manufacturing Analysis *I and II, 2*
Theory and applications of materials processing technology; thermal considerations, mechanics of machine systems, power and force relations, and tool analyses. Numerical control of metrology will also be emphasized. *(Lec. 1, Lab. 3) Prerequisite: credit or registration in CVE 220 or permission of department.* Staff

350, 351 Industrial Engineering Systems Design I, II *I and II, 3 each*
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. Design and analysis of industrial engineering systems. *(Lec. 3) Prerequisite: for IDE 350, IDE 221, 412, 432; for IDE 351, IDE 350, 433.*

391, 392 Special Problems in Industrial Engineering *I and II, 1-3 each*
Independent study and seminar type work under close faculty supervision. Discussion of advanced topics in industrial engineering in preparation for graduate work. *Prerequisite: junior standing and permission of department.* Staff

404 Engineering Economy *I, 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) Prerequisite: ECN 123, MTH 142. Not open to students with credit in IDE 220.* Staff

411 Engineering Statistics I *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) Prerequisite: MTH 142.* Staff

412 Engineering Statistics II *II, 3*
Continuation of IDE 411. Estimation, hypotheses tests, sampling theory, linear regression. Other engineering applications of applied statistics. *(Lec. 3) Prerequisite: IDE 411.* Staff

422 Production Facilities Design *II, 3*
Analysis and design of production facilities. Line and manpower balancing. Design of material flow networks. Quantitative modeling and simulation applied to productions facilities design. *(Lec. 3) Prerequisite: IDE 411, 432.* Staff

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. An analysis of the influence of unions on labor price theory. *(Lec. 3) Prerequisite: senior standing.* James

432 Operations Research I *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) Prerequisite: MTH 243, MTH 215 or equivalent.* Staff

433 Operations Research II *II, 3*
Introduction to inventory and replacement models, queuing theory, simulation, simple stochastic models, and their relation to selected problems in industrial engineering. *(Lec. 3) Prerequisite: IDE 412, MTH 243.* Branson

440 Materials Processing and Metrology I *II, 3*
Analyses of material behavior characteristics under dynamic loading conditions for tools and cutting materials. Thermal analyses, mechanics of machine systems, power and efficiency. Processing control systems such as digital control, analog control, and numerical control. Design and analyses of systems of metrology. *(Lec. 2, Lab. 3) Prerequisite: CHE 332 or 437, CVE 220.* 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. Prerequisite: permission of department.* Staff

500 Network Application in Industrial Engineering *II, 3*

510 Human Factors *II, 3*

513 Statistical Quality Control *I, 3*

517 Applied Control Theory in Industrial Engineering *I, 3*

520 Material Handling *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*

550, 551 Advanced Topics in Probabilistic Operations Research I and II *I and II, 3 each*

555 Engineering Applications of Mathematical Programming I *I, 3*

556 Engineering Applications of Mathematical Programming II *II, 3*

560 Process Engineering *II, 3*

565 Theory of Scheduling *II, 3*

591, 592 Special Problems *I and II, 1-6 each*

INSURANCE (INS)

CHAIRMAN: Professor Poulsen

301 Fundamentals of Risk Management and Insurance *I and II, 3*
Basic course in risk management and insurance which

provides an introduction to all areas of insurance: property, liability, life and health. *(Lec. 3)* Staff

313 Property Insurance *II, 3*
Insurance coverage for direct and indirect damage to real and personal property with emphasis on fire and marine perils and major package policies. *(Lec. 3)* Staff

314 Liability Insurance *I, 3*
Insurance coverages for commercial and personal lines with emphasis on liability, workmen's compensation, suretyship and other coverages. *(Lec. 3)* Staff

322 Automobile Insurance *II, 3*
Detailed study of the law of negligence and automobile liability insurance, automobile physical damage insurance; financial responsibility laws; manuals; forms. *(Lec. 3)* Staff

325 Life Insurance *II, 3*
Functions of life insurance, types of contracts, settlement options, simple programming, computation of premiums and reserves, dividends, contract interpretation. Industrial life, group insurance, pension plans, health insurance, company organization, state supervision. *(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

333 Social Insurance *I, 3*
Federal, state and private programs of economic security and social insurance including workmen's compensation, non-occupational disability, pension plans, survivor's insurance, unemployment compensation, health insurance, employee benefit programs, guaranteed wages, etc. *(Lec. 3) Prerequisite: ECN 125 and 126.* Staff

ITALIAN (ITL)

SECTION HEAD: Assistant Professor Viglionese

101, 102 Elementary Italian *I and II, 3 each*
Elements of the language, pronunciation, grammar, inductive reading; exercises in reading, writing, and conversation. *(Lec. 3)* Staff

103, 104 Intermediate Italian *I and II, 3 each*
Development of facility in reading texts of moderate difficulty, supplemented by further work in grammar, conversation, and composition. *(Lec. 3) Prerequisite: ITL 102 or permission of department.* Staff

205, 206 Conversation and Composition
I and II, 3 each
Intensive course in conversation and composition. Promotes facility in speaking and understanding idiomatic Italian. *(Lec. 3) Prerequisite: ITL 104 or permission of department.* Staff

325, 326 Introduction to Italian Literature
I and II, 3 each
Basic course in appreciation of literature. Representative texts of Italian narrative, drama, and lyric poetry. Elements of the methods of criticism. *(Lec. 3) Prerequisite: ITL 104.* Trivelli

391, 392 Masterpieces of Italian Literature
I and II, 3
Reading in English translation of selected Italian authors of greatest significance. *ITL 391:* Medieval and Renaissance. *ITL 392:* Post-Renaissance to twentieth century. *(Lec. 3) May not be used for major credit in Italian.* Capasso

409, 410 History of the Italian Language
I and II, 3 each
ITL 409: Development of the Italian language from Latin. Early documents and dialects. Sound and form changes between vulgar Latin and early Italian. *ITL 410:* Evolution of the Italian language through the centuries. Examination and discussion of the various dissenting factions which contributed to the formation of the national language. *(Lec. 3) Prerequisite: ITL 206. In alternate years, next offered 1973-74.* Marcheschi

411, 412 Italian Literature of the Middle Ages
I and II, 3 each
Intensive study of Italian literature in the medieval period, with special emphasis on Dante's minor works. *(Lec. 3) Prerequisite: ITL 206. In alternate years, next offered 1974-75.* Staff

421, 422 Italian Literature of the Renaissance
I and II, 3 each
Representative writers of the period read and discussed against the background of the cultural history of Renaissance Italy. Emphasis on Petrarca, Boccaccio, Poliziano, Machiavelli, Ariosto and Tasso. *(Lec. 3) Prerequisite: ITL 206. In alternate years, next offered 1973-74.* Viglionese

431 Italian Literature of the Seventeenth Century *I, 3*
Special attention to principal literary movements of the century as illustrated by leading writers of the period. *(Lec. 3) Prerequisite: ITL 206. In alternate years, next offered 1974-75.* Viglionese

442 Italian Literature of the Eighteenth Century *II, 3*
Special attention to principal literary movements of the century as illustrated by leading writers of the period. *(Lec. 3) Prerequisite: ITL 206. In alternate years, next offered 1974-75.* Viglionese

451, 452 Italian Literature of the Nineteenth Century
I and II, 3 each
Study of representative authors of the nineteenth century. *(Lec. 3) Prerequisite: ITL 206. In alternate years, next offered 1974-75.* Capasso

461, 462 Italian Literature of the Twentieth Century *I and II, 3 each*
Special attention to principal literary movements of

the century as illustrated by leading writers of the period. *(Lec. 3) Prerequisite: ITL 206. In alternate years, next offered 1973-74.* Trivelli

481, 482 La Divina Commedia *I and II, 3 each*
Analysis and interpretation of Dante's outstanding work from the social, religious, philosophical, and political viewpoints of the Middle Ages. *(Lec. 3) Prerequisite: ITL 411 and 412 or permission of instructor. In alternate years, next offered 1973-74.* Staff

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) Prerequisite: acceptance of a project by a member of the staff and department approval.* Staff

JOURNALISM (JOR)

CHAIRMAN: Associate Professor Batroukha

210 Introduction to Mass Communications *I and II, 3*
Communications media viewed as comprising an institutional order; its relation to other social orders, including the political, the industrial, and the military; the role of ideas in shaping media policy, structure, and content. Recommended for majors in English, the social sciences, and marketing. *(Lec. 3)* Staff

212 News Writing and Reporting *I and II, 3*
Fundamentals of news gathering and factual writing for the mass communications media. Practice in writing news and feature stories, with evaluation of each student's work. *(Lec. 2, Lab. 2)* Staff

215 Pictorial Journalism *I and II, 3*
Introduction to use of graphic arts in journalism. Emphasis on photography as a communications medium, with instruction and practice in basic techniques of picture taking, processing, and editing. *(Lec. 2, Lab. 2) Prerequisite: permission of department.* Staff

300 Media Criticism in America *II, 3*
Contemporary and historic methods and perspectives for monitoring the performance of newspapers, magazines, motion pictures, broadcasting, and advertising. Examination of journalism reviews and press council operations. *(Lec. 3)* 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. Analysis of markets, freelance and job opportunities. Articles are written and submitted to publications during the course. *(Lec. 3) Prerequisite: junior standing and permission of department.* Staff

325 Copy Editing *I and II, 3*
Instruction and practice in news selection and display, copy editing, headline writing, illustration, and page make-up of newspapers and other periodicals. *(Lec. 2, Lab. 2) Prerequisite: JOR 212 or permission of department.* Staff

326 Advanced Reporting *I and II, 3*
Instruction and supervision in planning, developing and writing news stories for publication and/or broadcasting. Class sessions and outside assignments include press conferences with newsworthy individuals, investigative and interpretive reporting, and reporting in depth. *(Lec. 2, Lab. 2) Prerequisite: JOR 212, junior standing and permission of department.* Staff

334 History of Journalism in the United States *I, 3*
Development of the newspaper during the early, middle and later periods of nation's growth; rise of other media; effects of economic and social changes on the press; future of journalism in the United States. *(Lec. 3) Prerequisite: JOR 210 or 212, and junior standing.* Staff

361 Internship in News Writing and Reporting *I and II, 3*
Students are assigned to newspapers to do general reporting. Requires an average of eight hours a week practice time during the semester. Students meet as a group one hour a week. If a student's special interest warrants, he may be assigned to a medium other than a newspaper. *(Lec. 1, Lab. 8) Prerequisite: JOR 212 and permission of department.* Staff

362 Internship in News Editing *II, 3*
Students are assigned to newspapers for practice in various aspects of editing, with major emphasis on copy editing and headline writing. Requires an average of eight hours a week practice time during the semester. Students meet as a group one hour each week. If a student's special interest warrants, he may be assigned to a medium other than a newspaper. *(Lec. 1, Lab. 8) Prerequisite: JOR 325 and permission of department. In alternate years, next offered 1973-74.* Staff

434 (433) Contemporary Issues in Mass Communications *II, 3*
Mass media treatment of major topical issues of special public concern such as urban, minority, environmental and international problems as well as other political and economic issues. *(Lec. 3) Prerequisite: senior standing or permission of department.* Staff

435 Theory of Communication *I, 3*
General principles of communication. Emphasis on the effects of mass communications, propaganda techniques in the mass media and public opinion formation and change. *(Lec. 3) Prerequisite: senior standing or permission of department.* Staff

436 Fundamentals of Communication Research *II, 3*
General survey of concepts, research findings and hypotheses in mass communication research; introduction to the techniques of concept formation, data collection measurement and analysis of mass communication content, structure and process. *(Lec. 3)*

Prerequisite: senior standing or permission of department. Staff

438 Governmental and Legal Aspects of Mass Communication *I, 3*
Role of government and the law in the communication of news. Legal problems of the mass media—including basic laws affecting freedom of the press, as well as press privileges and responsibilities. Case studies used for illustration. *(Lec. 3) Prerequisite: senior standing or permission of department.* Staff

440 Criticism, Opinion and Interpretation in the Mass Media *II, 3*
Examination of increasing emphasis on interpretation and analysis in the reporting of public events; the development, present status and future prospects of mass media criticism in such fields as literature, health, architecture and the visual and performing arts; role of opinion in the form of both editorial pages and signed columns. *(Lec. 3) Prerequisite: senior standing or permission of department.* Staff

441 International Communications *I, 3*
Examination and comparison of the development, roles and purposes, structure, control, content, audiences, effects and problems of the print and broadcast media of some major foreign nations. *(Lec. 3) Prerequisite: senior standing or permission of department.* 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. *Prerequisite: junior standing, acceptance of a project by a member of the staff, and department approval.* Staff

443 Mass Communication Media in Africa *II, 3*
Examination of mass media resources and organization on the African continent; production and distribution systems and current problems; prospects for development and external influences. *(Lec. 3) Prerequisite: senior standing or permission of department.* Nwankwo

452 Public Relations Principles and Publications *I, 3*
General principles and procedures in public relations: emphasis on the role of the public relations practitioner as a specialist in communications; analysis of publications produced as part of a public relations function. *(Lec. 3) Prerequisite: senior standing or permission of department.* Staff

LATIN (LAT)

SECTION HEAD: Assistant Professor Cashdollar

101, 102 Elementary Latin *I and II, 3 each*
Latin grammar and syntax. Exercises in reading prose. *(Lec. 3)* Campbell

201 Intermediate Latin *I and II, 3*
Review of grammar, and exercises in reading prose or verse of an author to be selected. *(Lec. 3) Prerequisite: LAT 102 or equivalent.* Campbell

202 Intermediate Latin: Virgil *I and II, 3*
Reading and study of selected works of Virgil. *(Lec. 3) Prerequisite: LAT 201 or equivalent.* Campbell

311 Readings and Composition *I, 3*
Selected works of Horace, combined with practice in writing Latin prose. *(Lec. 3) Prerequisite: LAT 202 or equivalent.* Campbell

312 Readings and Composition *II, 3*
Reading of selected works of Latin prose, poetry, and/or drama. Writing of Latin prose. *(Lec. 3) Prerequisite: LAT 311 or equivalent.* Campbell

497, 498 Directed Study *I and II, 3 each*
Individual research and reports on problems of special interest. *Prerequisite: acceptance of a project by a member of the staff and departmental approval.* Staff

LIBRARY SCIENCE (LSC)

DEAN: Professor Humeston

500 Introduction to Libraries and Librarianship *I and II, 3*

502 Library Administration *I and II, 3*

503 Selection of Library Materials *I and II, 3*

504 Basic Reference *I and II, 3*

505 Cataloging and Classification *I and II, 3*

506 Technical Services *I and II, 3*

510 History of Books and Printing *I or II, 3*

511 Comparative Librarianship *I and II, 3*

512 History of Libraries and Librarianship *I or II, 3*

513 Intellectual Freedom and Censorship *I or II, 3*

514 (501) The Library in Society *I, 3*

520 The School Library *I and II, 3*

521 Public Library Service *I or II, 3*

522 College and University Library Service *I or II, 3*

523 Special Library Service *I or II, 3*

526 Automation in Libraries *I or II, 3*

527 Seminar in Library Administration *I and II, 3*

528 Multi-Media and the Library *I and II, 3*

529 Library Cooperation *II, 3*

530 Reading Interests of Children *I or II, 3*

531 Reading Interests of Adolescents *I or II, 3*

532 Reading Interests of Adults *I or II, 3*

533 Children's Library Materials *I and II, 3*

536 Storytelling *I, 3*

540 Library Materials in the Humanities *I and II, 3*

541 Library Materials in the Social Sciences *I and II, 3*

542 Library Materials in Science and Technology *I and II, 3*

543 Government Publications *I or II, 3*

544 Information Science for Librarians *I or II, 3*

545 Technical Information Centers *I and II, 3*

550 Advanced Cataloging *I or II, 3*

560 Research in Librarianship *I or II, 3*

591, 592, 593 Independent Work *By Appt., 1-3 each*

LINGUISTICS (LIN)

SECTION HEAD: Professor Porter

409, 410 Introduction to the Study of Language *I and II, 3 each*

LIN 409: Basic principles of descriptive linguistic science. *LIN 410:* Principles of historical linguistics. *(Lec. 3) Prerequisite: for 410, LIN 409. Accepted toward concentration credit in a language.* F. Woods

414 Romance Linguistics *II, 3*

Evolution of the major literary Romance languages (French, Spanish, Italian, Portuguese, Rumanian) from late Latin with emphasis on phonology and morphology. Analysis of representative texts in Latin and early Romance. The diffusion and dialectal fragmentation of Romance. Taught in English. *(Lec. 3) Prerequisite: FRN 205, SPA 205, ITL 205, or LIN 410, 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. Familiarization with language laboratory equipment and the monitoring of student exercises. Recommended for prospective teachers of language. *(Lec. 1) Prerequisite: 9 credit hours of language courses numbered 300 or above, or permission of department.* Staff

The following are related, specialized courses in historical linquistics offered in the Departments of English and Languages. They do not count as linguistics in Division A of the general education requirements.

ENG 530 History of the English Language
FRN 503, 504 History of the French Language
GER 409 History of the German Language
ITL 409, 410 History of the Italian Language
SPA 409 History of the Spanish Language

LITERATURE IN ENGLISH TRANSLATION

The following courses, offered within the Department of Languages, may not be used for major credit in either languages or English.

COORDINATOR: Professor Kossoff (Languages)

Classics
391 Masterpieces of Greek Literature
392 Masterpieces of Roman Literature
393 Literature of Greek Mythology

French
391 Survey of French Literature from the Middle Ages
392 Survey of Nineteenth-Century French Literature
393 Survey of Twentieth-Century French Literature

German
391, 392 Masterpieces of German Literature

Italian
391, 392 Masterpieces of Italian Literature

Russian
391, 392 Masterpieces of Russian Literature

Spanish
391, 392 Masterpieces of Spanish Literature

The following courses are offered for major credit in English but may not be used for major credit in languages.

English
261, 262 World Literature
361, 362 The European Novel
461 The Classic Epic
462 The Medieval and Modern Epic
465 Greek and Roman Drama
561 Modern European Novel

MANAGEMENT SCIENCE (MGS)

CHAIRMAN: Professor Vollmann

101, 102 Introduction to Quantitative Analysis for Business and Economics *I and II, 3 each*
Selected mathematical tools and techniques which facilitate analysis of business and economic problems and aid in the process of decision making. Includes selected topics from finite mathematics and modern mathematics, as well as applied differential and integral calculus. *(Lec. 3) Prerequisite: MGS 101 for MGS 102.* Armstrong, Budnick and Della Bitta

107 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

124 Statistical Drafting *II, 2*
Graphic methods for presenting statistical data. Preparation of charts and illustrations including practice in using lettering guides, drawing instruments, and other devices and materials currently utilized by visual information specialists. *(Lec. 2, Lab. 4-6)* Sternbach

201, 202 Managerial Statistics *I and II, 3 each*
MGS 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 hypothesis. *Prerequisite: MGS 102 and 107. MGS 202:* Additional data analysis techniques including tests of independence and goodness of fit, regression, correlation, analysis of variance, time series, and index. *(Lec. 3) Prerequisite: MGS 201.* Armstrong, Budnick, Della Bitta, Jarrett, Shen, Shih and Sternbach

301 Advanced Quantitative Foundations *I, 3*
Mathematical topics and applications which are 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) Prerequisite: MGS 102 or permission of instructor.* Staff

309 Operations Management *I and II, 3*
Survey of production and operations management problems, and models for their solution. Specific problems considered include project management, design and measurement of work, facilities location and layout, quality control, forecasting, and production planning and inventory control. *(Lec. 3) Prerequisite: MGS 202 or permission of instructor.* Schuldenfrei, Vollmann and Zartler

310 Materials Management *II, 3*
Intensified coverage of certain materials introduced in MGS 309. Particular attention is given to production planning and inventory control. Specific topics studied include forecasting, inventory models, data bases, production scheduling, aggregate capacity planning, and logistics. *(Lec. 3) Prerequisite: MGS 309.* Vollmann and Zartler

364 Quantitative Analysis of Managerial Operations *I, 3*
Survey of management science techniques for nonmajors, including linear programming, decision theory, simulation, and queuing. Applications in the functional areas are stressed. *(Lec. 3) Prerequisite: MGS 202 or permission of instructor.* Armstrong, Budnick, Della Bitta, Jarrett, Mojena, and Staff

365, 366 Management Science I and II *I and II, 3 each*
MGS 365: Analysis of mathematical and statistical models used in decision making in management. Deterministic and probabilistic models. Various applications to business are stressed. *Prerequisite: MGS 202 or permission of instructor. MGS 366:* Continuation. *(Lec. 3) Prerequisite: MGS 365 or permission of instructor.* Armstrong, Budnick, Jarrett, Mojena, Shen and Shih

370 Topics in Managerial Statistics *II, 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) Prerequisite: MGS 202 and MGS 301 or permission of instructor.* Staff

375 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) Prerequisite: MGS 202 or permission of instructor.* Armstrong, Jarrett, Mojena and Shih

383 (363) Data Processing Systems *I and II, 3*
Management of data and data processing systems. Topics include the major managerial issues associated with the design, implementation, and management of computer-based data processing systems *(Lec. 3) Prerequisite: MGS 107 or permission of instructor.* Staff

445 (457) Managerial Applications of Simulation *I, 3*
Study, evaluation and design of deterministic and probabilistic computer simulation models for operational and strategic levels of management. *(Lec. 3) Prerequisite: MGS 366 or permission of instructor.* Staff

458 Advanced Production Management *II, 3*
Analysis of company operations within an industry context. Definition of unique strengths and weaknesses of a company within the environment in which it operates. Specific techniques, e.g.; PERT, production planning, selected in terms of company strategy. *(Lec. 3) Prerequisite: MGS 310, 445, or permission of instructor.* Vollmann and Zartler

476 Management System Analysis *II, 3*
Interrelation and integration of systems in management. Analysis of the framework of optimization of the system objective relative to its environmental constraints. *(Lec. 3) Prerequisite: MGS 383 or permission of instructor.* Schuldenfrei, Vollmann and Zartler

491, 492 Special Problems *I and II, 3 each*
Lectures, seminars, and instruction in operations research techniques with special emphasis upon student research projects. *(Lec. 3) Prerequisite: permission of instructor.* Staff

579 (979) Computing in Management *I, 2*

580 (980) Quantitative Methods for Management Analysis *I and II, 3*

581 (981) Management Statistics *I and II, 3*

585 (985) Production and Operations Management *I, 3*

MARINE AFFAIRS (MAF)

521 Coastal Zone Law *II, 3*

MARKETING MANAGEMENT (MMG)

CHAIRMAN: Professor Alton

323 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)* Staff

331 Analysis of Sales Methods *I, 3*
Analytical study of the knowledge and performance of the sales force. Economic, sociological, and psychological relationships to the sales efforts in the market place. *(Lec. 3) Prerequisite: MMG 323 or permission of instructor.* Staff

332 Sales Management *I, 3*
Planning, organization, and control of sales operations. Emphasis is placed upon the sales manager's functions and problems. Cases. *(Lec. 3) Prerequisite: MMG 323.* Bowman

334 Consumer Behavior *I, 3*
Analysis and review of perception, motivation and communication behaviors of consumers as they relate to marketing with particular emphasis upon advertising and selling. *(Lec. 3)* Staff

335 Fundamentals of Advertising *II, 3*
Condensed but comprehensive introduction to advertising. Basic course for advanced study of specific phases of advertising. *(Lec. 3) Prerequisite: MMG 323 or permission of instructor.* Hill

355 Advertising Copy and Layout *I, 3*
Study and practice in creation of effective advertising copy and layout for print and broadcast media. *(Lec. 2, Lab. 3) Prerequisite: MMG 335 or permission of instructor.* Hill

443 Retail Store Management *I, 3*
Store organization, operation and control. *(Lec. 3) Prerequisite: MMG 323.* Staff

452 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) Prerequisite: MMG 323.* Loudon

462 Marketing Research *II, 3*
Nature, scope and applications of marketing and advertising research. *(Lec. 3) Prerequisite: MGS 202, MMG 323.* Staff

464 Marketing Policy and Problems *II, 3*
Summary course with emphasis upon decision making in all marketing areas. Emphasis on use of the case method. *(Lec. 3) Prerequisite: MMG 323 and senior standing.* Staff

466 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) Prerequisite: MGS 202 or equivalent, MMG 323.* Staff

474 Advertising Seminar *I, 3*
Summary course covering advertising problems, innovations, ethics, laws and the literature. Major paper required on a significant problem in the field. *(Lec. 3) Prerequisite: MMG 335 or graduate standing, or permission of instructor.* Hill

475 Advertising Campaigns *II, 3*
Analyses and execution of advertising campaigns. Utilizes skills from other advertising and marketing studies. Field trips. *(Lec. 3) Prerequisite: MMG 335, 462, or graduate standing, or permission of instructor.* Hill

481, 482 Directed Study *I and II, 3 each*
Independent study supervised by department faculty. Seminar meetings concerned with specific marketing topics. *Prerequisite: permission of department.* Staff

550 (950) Theory and Practice *I and II, 2*

MATHEMATICS (MTH)

CHAIRMAN: Professor Ladas

107 Introduction to Finite Mathematics *I and II, 3*
Introduction to concepts and processes of modern mathematics concerned with logic, sets, and the the-

ory 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

108 Topics in Mathematics *I and II, 3*
Designed to introduce the non-mathematics student to the spirit of modern mathematics. Topics are from number theory, topology, set theory, algebra, and presuppose little mathematical background. Emphasis is on the development of reasoning ability and not on manipulative techniques. *(Lec. 3) Not open to mathematics majors except for mathematics education students.* Staff

109 Algebra and Trigonometry *I and II, 3*
Sets and real numbers, introduction to elementary functions (polynomial, exponential, logarithmic and trigonometric functions), analytic geometry, complex numbers. *(Lec. 3) Not open to students who have had four years of high school mathematics except with permission of department.* Staff

125 Fundamentals of Euclidean Geometry *II, 3*
Rigorous development of elementary Euclidean plane geometry. Introduction to non-Euclidean geometries for comparison. Recommended for those planning to teach geometry in secondary schools. *(Lec. 3)* Staff

141 Introductory Calculus with Analytic Geometry *I and II, 3*
Integration of calculus and analytic geometry. The analytic geometry treats such topics as graphing, straight line and conic sections; the calculus deals with the applications of the derivative in determining maxima and minima rates of change, and in the study of rectilinear motion. Antidifferentiation is introduced early and is used to find area, volume, length of arc and surface area. *(Lec. 3) It is recommended that students electing MTH 141 have completed four units of high school mathematics including trigonometry.* Staff

142 Intermediate Calculus with Analytic Geometry *I and II, 3*
Second course completes the integrated study of both plane analytic geometry and of differential and integral calculus. Applications related to trigonometric, logarithmic, and exponential functions, including polar coordinates and vector algebra, are covered. *(Lec. 3) Prerequisite: MTH 141 or equivalent.* Staff

215 Introduction to Algebraic Structures *I, 3*
Elementary properties of groups, rings, fields, and vector spaces. Detailed study of finite dimensional vector spaces, linear transformations, matrices, determinants, and systems of linear equations. *(Lec. 3) Prerequisite: MTH 142 or equivalent.* Staff

243 Calculus and Analytic Geometry of Several Variables *I and II, 3*
Applications of analytic geometry and calculus to space of three dimensions, including multiple integration and partial differentiation. It also includes infinite series. *(Lec. 3) Prerequisite: MTH 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 are studied. This course is basic for further study in applied mathematics and for advanced work in physics and engineering. *(Lec. 3) Prerequisite: MTH 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) Prerequisite: MTH 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 will be presented using both synthetic and analytic methods. *(Lec. 3) Prerequisite: MTH 141 or equivalent.* Staff

335, 336 Advanced Calculus I, II *I and II, 3 each*
Sets and functions, real topology, continuity and uniform continuity, the Riemann integral, improper integrals, sequences and series of functions, implicit and inverse function theorems, transformation of multiple integrals. Detailed proofs emphasized. *(Lec. 3) Prerequisite: MTH 243.* Staff

353 Foundations of Mathematics *I, 3*
Sets and relations. Construction of the integers, rational numbers, and real numbers from postulates. Completeness of the real number system. Axiom of choice. Transfinite cardinal and ordinal numbers. Transfinite induction. *(Lec. 3) Prerequisite: MTH 142 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) Prerequisite: MTH 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) Prerequisite: MTH 243.* 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. *Prerequisite: permission of department.* Staff

418 Matrix Analysis *II, 3*
Canonical forms, functions of matrices, characteristic roots, applications to problems in physics and engineering. *(Lec. 3) Prerequisite: MTH 215 or permission of instructor.* Staff

423 Introduction to Differential Geometry *I, 3*
Calculus on Euclidean space, curves and surfaces, Frenet formulas, normal and Gaussian curvature. Differentiable manifolds, tangent spaces, vector fields and integral curves. *(Lec. 3) Prerequisite: MTH 215 and 243.* Staff

425 Topology *I, 3*
Abstract topological spaces and continuous functions. Generalizations of some classical theorems of analysis. *(Lec. 3) Prerequisite: MTH 243 or equivalent.* 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) Prerequisite: MTH 244.* Staff

442 Vector and Tensor Analysis *II, 3*
Linear transformations, covariant and contravariant vectors. Vector calculus. Divergence and Stokes' theorems. *(Lec. 3) Prerequisite: MTH 244 or equivalent.* 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) Prerequisite: MTH 244 and permission of instructor.* Staff

451 Introduction to Probability and Statistics *I, 3*
Theoretical basis and fundamental tools of probability and statistics. Probability spaces, properties of probability, distributions, expectations. Some common distributions and elementary limit theorems. Basic principles of statistical testing and estimation. *(Lec. 3) Prerequisite: MTH 243 or equivalent.* Staff

452 Mathematical Statistics *II, 3*
Continuation of MTH 451 in the direction of statistics. Theory of statistical inference, the standard tests, regression, analysis of variance. *(Lec. 3) Prerequisite: MTH 451.* Staff

456 Probability *II, 3*
Continuation of MTH 451 in the direction of probability theory. Further problems in probability theory and applications. Markov chains and other stochastic processes. Generating functions, integral transforms and other advanced techniques. *(Lec. 3) Prerequisite: MTH 451.* 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) Prerequisite: MTH 244.* Staff

462 Functions of a Complex Variable *I and 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) Prerequisite: MTH 243 or equivalent.* Staff

471 (373) Numerical Methods with Programming *I and II, 3*
Methods in numerical analysis with computer programming. Flow charts, FORTRAN language. *(Lec. 3) Prerequisite: MTH 243.* Staff

472 Introduction to Numerical Analysis *I, 3*
Basic operations of computation, approximation, interpolation, numerical differentiation and integration. Numerical solution of ordinary differential equations. Numerical solution of sets of equations. Matrix inversion. *(Lec. 3) Prerequisite: MTH 244.* 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. *Prerequisite: permission of department.* Staff

515, 516 Algebra I, II *I and II, 3 each*

525 Topology I *I, 3*

526 Topology II *II, 3*

535, 536 Measure Theory and Integration *I and II, 3 each*

545, 546 Ordinary Differential Equations I, II *I and II, 3 each*

550 Advanced Probability *I, 3*

551 Advanced Mathematical Statistics I *I, 3*

552 Advanced Mathematical Statistics II *II, 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)

CHAIRMAN: Professor Test

161 Mechanics I *I and II, 3*
Mechanics of particles; including equilibrium of particles and systems of particles, kinematics and kinetics of the motion of particles, work-energy and impulse-momentum of particles. *(Lec. 3) Prerequisite: MTH 141.* Staff

162 Statics *I and II, 3*
Study based on Newton's laws of force systems in equilibrium and their effects on particles, systems of particles, and rigid bodies. Both scalar and vector methods of analysis are developed. *(Lec. 3) Prerequisite: MTH 141.* Staff

212 Mechanical Engineering Laboratory I *II, 1*
For description of this course, see MCE 316.

261 Mechanics II *I and II, 3*
Mechanics of rigid bodies; including equilibrium of rigid bodies, kinematics and kinetics of plane motion of rigid bodies, work-energy and impulse momentum of rigid bodies, centroids and moments-of-inertia. *(Lec. 3) Prerequisite: MCE 161.* Staff

263 Dynamics *I and II, 3*
Kinematic and kinetic study of the motion of particles, systems of particles, and rigid bodies, acted upon by unbalanced force systems, using both scalar and vector methods and including the development of methods of analysis based on the direct application of Newton's laws, the work-energy principle, and the impulse-momentum principle. *(Lec. 3) Prerequisite: MCE 162.* Staff

313 Mechanical Engineering Laboratory II *I, 1*

314 Mechanical Engineering Laboratory III *II, 1*

315 Mechanical Engineering Laboratory IV *I, 1*

316 Mechanical Engineering Laboratory V *II, 1*
Courses MCE 212 and 313 through 316 compose an integrated sequence of laboratory courses from the sophomore through senior year. Subjects include statistical data analysis, curve plotting and fitting, techniques of engineering computations and report writing, digital and analog computer techniques, basic measurement techniques and principles of error evaluation, demonstration experiments, and measurements in basic areas of dynamics, fluid mechanics, stress analysis, sound, vibration, thermodynamics, heat transfer, lubrication, and other aspects of mechanical engineering. Comprehensive tests on prime movers and mechanical apparatus, such as boilers, turbines, internal combustion engines, waterwheels, pumps, refrigeration equipment, wind tunnels, compressors, etc., are included. In the senior year the student carries out specialized tests and experiments of his own choice or engages in a project introducing him to research, on which comprehensive reports are required. *(Lab. 3 each)* Staff

323 Kinematics *I and II, 3*
Analysis of mechanisms by analytical and related graphical methods including 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) Prerequisite: EGR 102, MCE 263.* Hatch and Staff

336 Introduction to Air Pollution Control *II, 3*
Meteorological and legal aspects, effects, sources, and control of air pollution. *(Lec. 2, Lab. 3) Prerequisite: permission of department.* DeLuise

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. The use of thermodynamic property tables. The development of the concepts of reversibility and availability. A study of thermodynamic diagrams and processes. *(Lec. 3) Prerequisite: MTH 243, MCE 263, credit or registration in PHY 341.* DeLuise, Lessmann, and Test

342 Mechanical Engineering Thermodynamics *II, 3*
Continuation of MCE 341 including the study of mixture of gases and vapors, topics of gas dynamics and chemical thermodynamics, and applications of thermodynamics to power cycles and refrigeration processes. *(Lec. 3) Prerequisite: MCE 341.* Parker, Wilson and Test

354 Fluid Mechanics *I and II, 3*
Physical properties of fluids, development of continuity, energy, and momentum concepts using vector methods and the application of these concepts to problems involving viscous and non-viscous fluids including boundary layer flows and flows in closed conduits and around immersed bodies. *(Lec. 3) Prerequisite: MCE 263 and MTH 244 or 461.* Dowdell, Hagist, Lessmann, and White

366 Introduction to Systems Engineering *II, 3*
Systems analysis emphasizing control and vibration. Time and frequency domain techniques. Multidimensional and stochastic systems. Reliability. Interaction with economic, environmental, and human operator systems. *(Lec. 3) Prerequisite: MTH 244 and MCE 372, or permission of instructor.* Palm

372 Engineering Analysis I *I, 3*
Application of advanced mathematical methods to the solution of mechanical engineering problems with emphasis on the techniques of engineering analysis. *(Lec. 3) Prerequisite: MTH 244, junior standing.* Velletri and Nash

373 Engineering Analysis II *II, 3*
Continuation of MCE 372. *(Lec. 3) Prerequisite: MCE 372.* Staff

391, 392 Honors Work *I and II, 1-3 each*
Independent study and seminar-type work under faculty supervision for honors students. *Prerequisite: admission to departmental honors program.* Staff

401 (or OCE 401) Introduction to Ocean Engineering Systems *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) Prerequisite: MCE 351 and 354, or*

permission of instructor. Not for graduate degree program credit. Staff

402 (or OCE 402) Introduction to Ocean Engineering Systems II *II, 3*
Continuation of MCE 401. Flow of fluids to ocean systems. Psychrometry and mass transfer in pressurized environments. Human response to pressure. Design aspects of diving systems. Integrated system studies. *(Lec. 3) Prerequisite: MCE 401. Not for graduate degree program credit.* Staff

410 (or OCE 410) Basic Ocean Measurements *I or II, 3*
Students will carry out four or five basic ocean measuring exercises. Measurements of current and tide, dissolved oxygen, wave frequency spectra, soil characteristics from cores, water depth and bottom profiles. *(Lec. I, Lab. 6) Prerequisite: senior standing in engineering or permission of instructor. Not for graduate degree program credit.* LeBlanc and Schenck

417 (or ELE 417) Direct Energy Conversion *II, 3*
Stresses the physical understanding of processes by which energy is converted directly to electricity. Fuel cells and thermoelectric, thermionic, photovoltaic, and magnetohydrodynamic generators. *(Lec. 3) Prerequisite: background in electricity and magnetism, thermodynamics of fluid systems, and modern physics; permission of instructor.* Lessmann or Poularikas

423 Design of MachineElements *I, 3*
Design and analysis of machinery involving application of the principles of strength of materials. General problem of determining adequacy of design; factor of safety, stress concentration, fatigue, creep temperature stress. Study of mechanical power transmission devices, gears, springs, shafts, fasteners, ball bearing reliability. *(Lec. 3) Prerequisite: MCE 323, CVE 220.* Hatch and Staff

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) Prerequisite: MCE 323, MTH 244.* Hatch and Goff

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) Prerequisite: MCE 354.* Bradbury

426 Advanced Mechanics of Materials *II, 3*
Advanced problems in stress and deformation of elastic members; general stress relations, principal stresses, theories of failure, thick cylinders and discs, curved bars, torsion of noncircular members, and buckling of bars, plates and shells. *(Lec. 3) Prerequisite: CVE 220.* Hatch and Goff

428 Mechanical Control Systems *II, 3*
Analysis of mechanical, electromechanical, hydraulic, pneumatic, and thermal control systems; transient and frequency response of linear systems; introduction to Laplace transformation applied to automatic control systems, transfer function, system stability; computer applications. *(Lec. 3) Prerequisite: MCE 263 or equivalent and MTH 244.* Nash and Wilson

429 Comprehensive Design *II, 3*
Creative design of engineering systems including possible socioeconomic and ecological considerations. Projects involving original design and analyses. Selected advanced topics in design: reliability and probability and probability considerations, decision theory, optimum design, case studies of recent innovations. *(Lec. 3) Prerequisite: MCE 423.* Hatch and Nash

437 Rocket Propulsion *II, 3*
Propellants and propellant systems. Discussion of rocket design on basis of principles of thermodynamics, fluid mechanics and heat transfer. *(Lec. 3) Prerequisite: MCE 342, 354, 448, or permission of instructor.* DeLuise and White

438 Internal Combustion Engines *I, 3*
Principles, design and operation of internal combustion engines, including cycles, combustion, fuels, detonation, carburation, cooling and heat transfer, supercharging, ignition, engine friction and lubrication. Gasoline and diesel, two- and four-stroke cycle types and performance of various engines. *(Lec. 3) Prerequisite: MCE 342.* Parker

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) Prerequisite: MCE 342 and 448 or permission of instructor.* Parker

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 and study of heat and mass transfer in equipment such as heat exchangers and steam condensers. *(Lec. 3) Prerequisite: MCE 341.* Wilson, Parker and DeLuise

455 Advanced Fluid Mechanics *I, 3*
Continuation of MCE 354. Selected topics in advanced fluid mechanics including potential flows, gas dynamics, fluid machinery, and electric and magnetic field effects. *(Lec. 3) Prerequisite: MCE 354.* Dowdell, Hagist, Lessmann and White

457 (or OCE 457) Fluidics *II, 3*
Description and analysis of various fluidic devices with special emphasis on jet attachment devices. Fluid circuit theory including the design of fluidic systems for special applications. *(Lec. 3) Prerequisite: MCE 354.* Wilson

463 Intermediate Dynamics *I, 3*
Dynamics of particles and rigid bodies developed by vector methods. Applications in planetary, projectile

and gyroscopic motion. Introduction to Lagrangian mechanics; generalized coordinates, virtual work. Lagrange's equations and applications. *(Lec. 3) Prerequisite: MTH 244, MCE 263.* Velletri and Staff

464 Vibrations *II, 3*
Elementary theory of mechanical vibrations, including the one-degree-of-freedom system, multimass systems, vibration isolation, torsional vibration, beam vibration and critical speeds, analogies and vibration instruments. *(Lec. 3) Prerequisite: MCE 366 or permission of instructor.* Bradbury, Hatch and Velletri

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. and Lab. according to nature of problem) Credits not to exceed total of 12. Prerequisite: permission of department.* Staff

501, 502 Graduate Seminar *I and II, 1 each*

503 (or ELE 503) Linear Control Systems *I, 3*

517 (or ELE 517) Magnetofluidmechanics *I or II, 3*

521 Reliability Analysis and Prediction *II, 3*

524 Advanced Kinematics and Linkage Design *I, 3*

531 Underwater Power Systems *II, 3*

532 Coastal Zone Power Plants *I, 3*

540 Environmental Control in Ocean Engineering *II, 3*

541 Thermodynamics *I, 3*

542 Statistical Thermodynamics *II, 3*

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*

563 Advanced Dynamics *I and II, 3*

564 Advanced Vibrations *I, 3*

565 Advanced Vibrations *II, 3*

572 Theory of Elasticity *II, 3*

573 Theory of Plates *I and II, 3*

575 Elastic Stability *I and II, 3*

MEDICAL TECHNOLOGY (MTC)

DIRECTOR: Associate Professor C. W. Houston

101, 102 Medical Technology Seminar *I and II, 1 each*
Lectures, discussions and demonstrations designed to relate college course work to that of the hospital laboratory. *(Lec. 1) Required of freshmen in the Medical Technology curriculum.* Houston

201, 202 Medical Technology Seminar *I and II, 1 each*
Lectures, discussions and demonstrations designed to relate college course work to that of the hospital laboratory. *(Lec. 1) Required of sophomores in the Medical Technology curriculum.* Houston

MEDICINAL CHEMISTRY (MCH)

CHAIRMAN: Professor Bond

334 Inorganic Medicinal Chemistry *I, 2*
Physical properties and chemical structures, physical properties and biological activity, inorganic compounds of medicinal and pharmaceutical importance including radioisotopes. *(Lec. 2) Prerequisite: third-year standing and permission of department.* Bond

342 Pharmaceutical Analysis *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) Prerequisite: third-year standing and 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) Prerequisite: CHM 222.* Abushanab and Turcotte

497, 498 Special Problems *I and II, 1-5 each*
Method of carrying out a specific research project in medicinal chemistry. Literature search, planning, laboratory work and the writing of an acceptable report. *(Lab. 3-15) Prerequisite: permission of department.* Staff

501 Radiopharmaceuticals *I, 3*

526 Lipid Chemistry *II, 3*

533 Advanced Drug Assay *I and II, 2-4*

548 (or PCG 548) Physical Methods of Identification *II, 3*

549 Synthesis *I and II, 3*

MICROBIOLOGY (MIC)

CHAIRMAN: Professor N. P. Wood (Microbiology and Biophysics)

201 General Microbiology *I and II, 4*
Survey of cultivation and morphology of bacteria, effects of environment on bacteria, and various activities of bacteria. Other microorganisms are also studied briefly. *(Lec. 3, Lab. 3) Prerequisite: 1 semester of biology and 1 year of chemistry.* Staff

361 Soil Bacteriology *I, 3*
Various types of bacteria found in soil which affect its fertility. Decomposition of organic matter, nitrification, denitrification, nitrogen-fixation, soil inoculation, methods of counting and culturing soil bacteria. *(Lec. 2, Lab. 2) Prerequisite: MIC 201 and 1 semester organic chemistry. In alternate years, next offered 1974-75.* Shivvers

412 Food Microbiology *II, 3*
Lectures and laboratory practice in analysis of water and milk and in the examination of dairy and other food products. *(Lec. 2, Lab. 4) Prerequisite: MIC 201 and 1 semester organic chemistry (may be taken concurrently).* Houston

432 Pathogenic Bacteriology *II, 3*
The more important microbial diseases, their etiology, transmission, diagnosis and control. In laboratory, emphasis is placed on methods of diagnosis. *(Lec. 2, Lab. 3) Prerequisite: MIC 201 and 1 semester organic chemistry.* Carpenter

491, 492 Research in Microbiology *I and II, 1-6 each*
Special problems in microbiology. Student required to outline his problem, carry on experimental work and present his conclusions in a report. *(Lab. 2 to 12)* Staff

495, 496 Seminar in Microbiology *I and II, 1 each*
Preparation and presentation of papers on selected subjects in microbiology. *(Lec. 1) Prerequisite: permission of department.* Staff

533 Immunity and Serology *I, 3*

541 Physiology of Bacteria *I, 4*

552 Microbial Genetics *II, 3*

593, 594 The Literature of Bacteriology *I and II, 2 each*

Note: for Virology, see Animal Pathology; for Mycology, see Botany.

MILITARY SCIENCE (MSC)

CHAIRMAN: Professor Carter

110 Military Science *I, 2*
Basic concepts of military history; principles of war; definitions of strategy, tactics, logistics, civil-military relations. Warfare through the ages; antiquity—Persia to the Civil War. *(Lec. 2)* Mason

120 Military Science *II, 2*
Warfare through the ages: Civil War through the Korean War. Civilian control. Developing a limited war capability. Counter insurgency. *(Lec. 2) Prerequisite: MSC 110 or permission of department.* Mason

210 Military Science *I, 2*
National security and the concept of force. The bases of a nation's capacity for developing force; geographical position, nature of population. *(Lec. 2, Lab. 2)* Bonner

220 Military Science *II, 2*
National security and the concept of force. Force as related to other types of influence, levels of military force, areas of effectiveness of these types of war, and military doctrines regarding these types of military force. *(Lec. 2, Lab. 2) Prerequisite: MSC 210 or permission of department.* Bonner

310, 320 Military Science *I and II, 2 each*
Advanced courses: application of the principles of war, small unit tactics, leadership development, plan and execute tactical problems. *(Lec. 2, Lab. 2) Prerequisite: permission of department and successful completion of basic courses, or completion of basic camp or equivalent; for MSC 320, MSC 310.* Robinson

330, 340 Military Science (General) *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) Prerequisite: permission of department; for MSC 330, MSC 320; for MSC 340, MSC 330.* Staff

MUSIC (MUS)

CHAIRMAN: Professor Giebler

050 Applied Music Preparatory *I and II, 0*
Class or private instruction. Select appropriate letter and voice or instrument from the list under MUS 251 below and add to course number, as 50E Violin. The course may be repeated for a second semester if the work of the first semester is satisfactory. *(Lec. 1)* Staff

101 Introduction to Music *I and II, 3*
Introductory course designed to foster a better understanding and appreciation of the world's great music. A consideration of musical styles, techniques and forms from the listener's standpoint. *(Lec. 3)* Buck, Kent and Staff

102 Music Masterworks *II, 3*
A selection of music masterworks from different eras stressing those elements which elevate these compositions above others. Discriminatory listening will be stressed. *(Lec. 3) Prerequisite: MUS 101 or equivalent.* Staff

113, 114 Diatonic Harmony and Ear Training *I and II, 3 each*
MUS 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. 2, Lab. 3) Prerequisite: concurrent or previous keyboard experience. MUS 114:* Continuation, covering all diatonic triads, dominant and supertonic seventh chords, and modulation to closely related keys. *(Lec. 2, Lab. 3) Prerequisite: MUS 113.* Fuchs and Rankin

117 Applied Composition *I and II, 1*
Private study in composition for students interested in original work in contemporary idioms. Emphasis on the mastery of the basic craft and individual creative expression. May be repeated once for additional credit. *(Lec. 1) Prerequisite determined by audition.* Gibbs

169 Percussion Instruments Class *I or II, 1*
Basic principles in performance and pedagogy of percussion instruments. *(Lec. 1) Open only to students in the music education curriculum.* Goneconto

171, 172 Piano Class *I and II, 1 each*
Development of basic techniques and musicianship for effective use of the piano in the music class rooms. *(Lec. 1) Open only to students in the music education curriculum.* Green

173, 174 Voice Class *I and II, 1 each*
Basic principles and pedagogy of singing, physiology, breathing, tone production, diction. *(Lec. 1) Open only to students in the music education curriculum.* Abusamra

175, 176 String Instruments *I and II, 1 each*
Basic principles in performance and pedagogy of violin or viola and violoncello or bass viol. *(Lec. 1) Open only to students in the music education curriculum.* Staff and Adams

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. *(Lec. 1) Open only to students in the music education curriculum.* Marinaccio and Zeitlin

179, 180 Brass Instruments Class *I and II, 1 each*
Basic principles in performance and pedagogy of trumpet, French horn, baritone, trombone, and tuba. *(Lec. 1) Open only to students in the music education curriculum.* Burns

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 *(Lec. 1). Open only to students in the music education curriculum. Prerequisite: MUS 172 or equivalent.* Green

215, 216 Advanced Harmony and Ear Training *I and II, 3 each*
MUS 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) Prerequisite: MUS 114 or equivalent. MUS 216:* Continuation, covering ninth, eleventh and thirteenth chords, melodic elaboration. Introduction to contrapuntal textures and contemporary idioms. *(Lec. 2, Lab. 2) Prerequisite: MUS 215.* Rankin

221, 222 History of Music *I and II, 3 each*
MUS 221: Development of music primarily in Western culture from Ancient times through the Middle Ages, Renaissance and the Baroque periods. *MUS 222:* Continuation to include the Rococo, Classical, Romantic, and Modern eras. *(Lec. 3) Prerequisite: MUS 101 or equivalent.* Kent

250 Recital Laboratory *I and II, 0*
Required of all music majors.

251 (251-254) Applied Music as Minor or Elective *I and II, 2*
Lower division. Private instruction. One 40-minute lesson and scheduled practice hours each week. Two levels, one per year, as prescribed in applied minor syllabi. *(Studio 6) Prerequisite: evidence by audition of at least two years' study at intermediate or high school level and permission of department.* Staff

Select area of instruction from the following and add to course number as MUS 251B, Piano:

A Voice	H Bass Viol	Q French Horn
B Piano	J Flute	R Trombone
C Organ	K Oboe	S Baritone Horn
D Harpsichord	L Clarinet	T Tuba
E Violin	M Bassoon	U Percussion
F Viola	N Saxophone	V Guitar
G Violoncello	P Trumpet	

261 (261-264) Applied Music Major *I and II, 3*
Lower division. Private instruction for applied majors only. One 60-minute or two 30-minute lessons and scheduled practice hours each week. Two levels, one per year, as prescribed in applied major syllabi. *(Studio 9) Prerequisite: evidence by audition of substantial study at intermediate level and permission of department. See under MUS 251 for areas of instruction.* Staff

304 Introduction to Contemporary Music *II, 2*
Major trends, forms, styles and idioms of music from 1875 to the present. *(Lec. 2) Prerequisite: MUS 101.* Gibbs

305 Folk Music *I, 3*
Study of folk songs, dances and instruments of the world with emphasis upon American sources. *(Lec. 3)* Staff

311, 312 Conducting *I and II, 2 each*
MUS 311: Choral conducting. Special techniques for direction and rehearsal of choral groups. Problems of tone, diction and balance and the organization of school, church, community and professional groups. Analysis of major choral works from the conductor's standpoint. *(Lec. 2) Prerequisite: MUS 216.* Abusamra. *MUS 312:* Instrumental conducting. Problems of the conductor; score reading, interpretation, technique of rehearsal and direction. *(Lec. 2) Prerequisite: MUS 216.* Buck

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) Prerequisite: MUS 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 of each student. *(Lec. 3) Prerequisite: MUS 317.* Gibbs

339, 340 Methods and Materials in Teaching Music in Public Schools *I and II, 3 each*
MUS 339: Organization of the vocal music program in the elementary and secondary school with analysis of method and introduction to materials. *(Lec. 3) Prerequisite: junior standing.* Green. *MUS 340:* Organization of the instrumental music program in the elementary and secondary school with analysis of method and introduction to materials. *(Lec. 3) Prerequisite: junior standing.* Burns

391 University Symphony Orchestra *I and II, 1 each*
Audition required. *(Lec. 3)* Buck

392 University Marching Band *I, 1*
Marching Band members also register for PEM 103 for 1 credit. Audition required. *(Lec. 3)* Burns

393 University Chorus *I and II, 1 each*
Audition required. *(Lec. 3)* Abusamra

394 Symphonic Wind Ensemble *II, 1*
Audition required. *(Lec. 3)* Burns

395 Concert Choir *I and II, 1 each*
Audition required. *(Lec. 3)* Abusamra

399 Chamber Music Ensembles *I and II, 1 each*
Chamber music ensembles are designated as A Keyboard Ensemble, B String Ensemble, C Woodwind Ensemble, D Brass Ensemble, E Percussion Ensemble, F Stage Band, G Madrigal Singers. 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. *(Lec. 2)* Staff

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) Prerequisite: MUS 101, 222.* Giebler

408 The Opera *II, 3*
History of the opera from its beginning in Florence at the turn of the seventeenth century to the present. *(Lec. 3) Prerequisite: MUS 221, 222.* Gibbs

418 Composition *II, 3*
Original work in small binary, ternary, variation and sonatina forms for various instrumental and vocal groups. *(Lec. 3) Prerequisite: MUS 317.* Gibbs

419 Composition *I, 2*
Continuation of MUS 418, stressing original composition in larger forms and study of twentieth-century techniques. *(Lec. 2) Prerequisite: MUS 418.* Gibbs

420 Counterpoint *II, 3*
Systematic study of motive manipulation with reference to traditional contrapuntal devices. Emphasis is placed upon harmonic counterpoint of late Baroque but more recent practices are considered. Creative work in canon, invention, fugue, and chorale-prelude. *(Lec. 3) Prerequisite: MUS 317.* Giebler

422 Advanced Orchestration *II, 2*
Continuation of MUS 321, emphasizing score reading and orchestrational styles. Transcription for orchestra of a major keyboard work required as a semester project. *(Lec. 2) Prerequisite: MUS 321.* Gibbs

427, 428 Sixteenth-Century Counterpoint *I and II, 2 each*
MUS 427: Practical study of modal polyphony based on the style of Palestrina and his contemporaries, covering *cantus firmus* techniques, imitation and various other contrapuntal devices in two-voice textures. *MUS 428:* Continuation of MUS 427. Writing in modal polyphonic textures of three to six voices. Motet and madrigal composition. *(Lec. 2) Prerequisite: MUS 216.* Giebler

431 The Baroque Era *I, 3*
Music of the so-called thorough-bass period (ca. 1600-1750) to include the emergence of opera and oratorio, autonomous instrumental music and the concerto style, culminating in the works of Bach and Handel. *(Lec. 3) Prerequisite: MUS 221, 222.* Giebler

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) Prerequisite: MUS 221, 222.* Giebler and Kent

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) Prerequisite: MUS 221, 222.* Giebler and Kent

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. *Prerequisite: completion of the most advanced undergraduate course in the field.* Staff

445 Music in the Elementary School *II, 3*
Detailed study of the objectives of music in the elementary grades together with an analysis of programming, procedure and supervision of music teaching at that level. *(Lec. 3) Prerequisite: MUS 339, its equivalent, or experience in teaching music.* Staff

446 Teaching General Music *II, 3*
Examination of philosophies, objectives, activities/experiences, and evaluative devices relating to general music study in the junior high school/middle school setting. *(Lec. 3) Prerequisite: MUS 339 or 340, or teaching experience.* Motycka

451 (451-454) Applied Music as Minor or Elective *I and II, 3*
Upper division. Private instruction. One 40-minute lesson and scheduled practice hours each week. Two levels, one per year as prescribed in applied minor syllabi. Senior recital required of music education majors. *(Studio 6) Prerequisite: completion of applied minor lower division and permission of department. See under MUS 251 for areas of instruction.* Staff

461 (461-464) Applied Music Major *I and II, 4*
Upper division. Private instruction for applied majors only. One 60-minute or two 30-minute lessons and scheduled practice hours each week. Two levels, one per year, as prescribed in applied major syllabi. Senior recital required of applied music majors. *(Studio 12) Prerequisite: completion of applied major lower division and permission of department. See under MUS 251 for areas of instruction.* Staff

481, 482 Piano Literature and Pedagogy *I and II, 2 each*
MUS 481: Intensive study of keyboard literature from 1700 to 1825. Analysis of styles and forms and their implications for performance. Study of teaching methods and materials. *(Lec. 2) Prerequisite: MUS 216, 222, and 252B or 262B or permission of department. MUS 482:* A continuation of MUS 481 involving literature from the nineteenth century to the present. *(Lec. 2) Prerequisite: same as for MUS 481.* Rankin

539 Advanced Principles of Music Education I *I, 3*

540 Advanced Principles of Music Education II *II, 3*

545 Musical Aptitude and Achievement *I, 3*

548 Research in Music Education *II, 3*

551 Applied Music as Minor or Elective *I and II, 2*

NUCLEAR ENGINEERING (NUE)

CHAIRMAN: Professor Treybal (Chemical Engineering)

538 (or CHE 538) Nuclear Metallurgy *II, 3*

581 (or CHE 581) Introduction to Nuclear Engineering *I and II, 3*

582 (or CHE 582) Radiological Health Physics *I, 3*

583 (or CHE 583) Nuclear Reactor Theory *II, 3*

585 (or CHE 585) Measurements in Nuclear Engineering *I, 3*

586 (or CHE 586) Nuclear Reactor Laboratory *II, 3*

NURSING (NUR)

DEAN: Professor Tate

101 Introduction to Nursing *I and II, 2*
Concepts of health and disease basic to nursing knowledge and practice. Basic needs of people. Influence of attitudes and beliefs on health, illness, caring and curing professions and institutions. *(Lec. 1, Rec. 1)* Staff

150 Human Sexuality *I and II, 2*
An 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. Changing social values, sexual mores and behavior and such social problems as illegitimacy, venereal disease, overpopulation and a social-sexual behavior are investigated. *(Lec. 2) Prerequisite: open to all matriculated undergraduate students. S/U credit.* Maternal Child Health Staff

211 Nursing in Contemporary Society *I and II, 3*
Trends and issues in professional practice and education and their relationship to the social order. Historical and philosophical foundation of nursing. *(Lec. 3) Open only to registered nursing students.* Houston

220 Fundamentals of Nursing *I and II, 4*
Basic course designed to develop an understanding of application of science principles in the practice of the profession of nursing; emphasis on meeting basic body needs of people. *(Lec. 2, Lab. 8) Prerequisite: NUR 101.* Staff

231 Care of the Adult I *I and II, 6*
Emphasis on the use of the problem-solving approach in the care of adult patients with major health and

nursing problems. Introduces pathophysiology and its relationship to patient care. *(Lec. 6) Prerequisite: sophomore standing, NUR 220 or R.N. status.* Kang and Staff

232 Care of the Adult I Nursing Practicum *I and II, 4*
Utilization of the problem-solving approach in learning to provide nursing care for adult patients with pathophysiological changes. *(Lab. 12). Must be taken concurrently with NUR 231.* Kang and Staff

301 Maternal and Child Health Nursing *I and II, 7*
Emphasis upon family-centered health concepts and their interrelationship with physiological, pathological, psychosocial and cultural influences on child growth and development and family functioning. *(Lec. 7) Prerequisite: CDF 200 or PSY 232; PHC 226 and NUR 231, 232. Must be taken concurrently with NUR 302.* Cumberland and Staff

302 Maternal and Child Health Nursing Practicum *I and II, 4*
Utilization of family-centered health concepts in the application of nursing principles and techniques to maternal and child care in selected community agencies. *(Lab. 12) Must be taken concurrently with NUR 301. S/U credit.* Cumberland and Staff

311 Mental Health and Psychiatric Nursing *I and II, 3*
Development of the basic knowledge and understanding necessary to the use of self as a therapeutic agent as related to mental health and illness. Application of content is made to all areas of nursing. *Prerequisite: NUR 231, 232. Must be taken concurrently with NUR 312.* Jacques and Staff

312 Mental Health and Psychiatric Nursing Practice *I and II, 3*
Supervised experience in the development of the ability to use oneself as a therapeutic agent as related to mental health and illness. Application of content is made to all areas of nursing. *(Lab. 9) Prerequisite: NUR 231, 232. Must be taken concurrently with NUR 311. S/U credit.* Jacques and Staff

320 Public Health and Public Health Nursing *I and II, 7*
Correlation of theory and practice of the basic principles of public health and public health nursing. Supervised field instruction in a public health nursing agency helps the student develop skills in giving health service to selected patients and families. *Prerequisite: NUR 301 and 302.* Staff

331 Care of the Adult II *I and II, 7*
Continuation of the problem-solving approach in nursing care of patients with pathophysiological conditions, and emphasis on patients with complex problems and long-term needs. *(Lec. 7) Prerequisite: NUR 231, 232, senior standing or permission of department.* Kang and Staff

332 Care of the Adult II Nursing Practicum *I and II, 5*
Utilization of the problem-solving approach in caring for adult patients with complex nursing problems and long-term needs in the clinical setting. Emphasis on the leadership, teaching and investigative role of the professional nurse. *(Lab. 15) Prerequisite: NUR 231, 232, senior standing or permission of department. Must be taken concurrently with NUR 331.* Kang and Staff

350 Conference on Professional Nursing *I and II, 2*
Discussion of major nursing and health issues. Emphasis is placed upon the professional nurse's responsibility to the profession and to the community in which she lives. *(Lec. 2) Prerequisite: senior standing.* Tate and Hart

390 Directed Study *I and II, 3*
Honors thesis or equivalent independent project relating to the nursing major. A faculty adviser provides guidance in problem delineation, development and drafting of a study plan in the area of a student's special interest. Project need not be completed in one semester, but no more than three credits are allowed. *Prerequisite: admission to College of Nursing honors program.* Staff

501, 503 Advanced Clinical Nursing *I or II, 3 each*

502, 504 Advanced Clinical Nursing Practicum *I or II, 3 each*

505 Research in Nursing *I, 3*

510 Teaching in Clinical Nursing *I or II, 3*

511 Teaching Practicum *I or II, 3*

512 Administration in Nursing Service *I or II, 3*

513 Practicum in Administration of Nursing Service *I or II, 3*

OCEAN ENGINEERING (OCE)

CHAIRMAN: Professor Sheets

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.

410 Basic Ocean Measurments
See Mechanical Engineering 410.

457 Fluidics
See Mechanical Engineering 457.

500 Basic Ocean Engineering *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*

524 Marine Structural Design *I or II, 3*

531 (or MCE 531) Underwater Power Systems *II, 3*

532 (or MCE 532) Coastal Zone Power Plants *I, 3*

534 Corrosion and Corrosion Control *I, 3*

535 Advanced Course in Corrosion *II, 3*

540 (or MCE 540) Environmental Control in Ocean Engineering *II, 3*

561 Introduction to the Analysis of Oceanographic Data *I, 3*

565 Ocean Lahoratory I *I or II, 3*

566 Ocean Laboratory II *I or II, 3*

571 (or ELE 571) Underwater Acoustics I *I, 3*

581 Coastal Engineering Geology *II, 3*

587 Submarine Soil Mechanics *I, 3*

591, 592 Special Problems *I and II, 1-6 each*

OCEANOGRAPHY (OCG)

DEAN: Professor Knauss

401 General Oceanography *I, 3*
General survey course in the major disciplines in oceanography including geological, physical, chemical, and biological aspects integrated into a conceptual approach to the sciences of the sea. *(Lec. 3) Prerequisite: at least one laboratory course in a physical or biological science and junior standing or above.* Staff

501 Physical Oceanography *I, 3*

509 Ecological Aspects of Marine Pollution *II, 2*

510 Descriptive Physical Oceanography *II, 3*

521 Chemical Oceanography *II, 3*

524 Chemistry of the Marine Atmosphere *II, 3*

540 Geological Oceanography *II, 3*

545 Geomagnetism and Paleomagnetism *I, 3*

547 Seminar in Biomagnetism *I, 2*

561 Biological Oceanography *I, 3*

567 Marine Bacteriology *I, 3*

568 Fishery Biology *II, 3*

571 Benthic Environment *I, 3*

574 Biology of Marine Mammals *II, 2*

ORGANIZATIONAL MANAGEMENT AND INDUSTRIAL RELATIONS (OMR)

CHAIRMAN: Professor Coates

300 Personnel Administration *I and II, 3*
Methods and techniques for developing and maintaining an efficient working force from the viewpoint of both employer and employee. Selection, placement, testing, training, discipline, morale, wage administration, job evaluation and stabilization. *(Lec. 3) Not open to management majors; no credit if MGT 303 has been taken.* Staff

301 Principles of Management *I and II, 3*
Managerial action within an organizational structure. Decision-making, communication and motivational activities interrelated in the management process. *(Lec. 3)* Raffaele and Overton

302 Group Dynamics in Industry *II, 3*
Application of theory and practice. Provides conceptual and working skills to analyze effects of groups on individual and organizational performance. *(Lec. 3)* DeLodzia

303 Personnel Administration and Organizational Behavior *I, 3*
Employer-employee problems at various internal levels and their impact on society. Recruitment, selection, testing, training, wages, manpower requirements, the growth of organized labor, collective bargaining, pension plans, management development programs, public relations and the role of the federal government. *(Lec. 3)* Schmidt, Kaiser and Staff

304 Personnel Management and Interpersonal Behavior *II, 3*
Basic problems of the personnel manager arising in human relations in the business concern. Case analysis method used emphasizing technical factors, human factors, time and space considerations and personnel principles and policies. *(Lec. 3) Prerequisite: OMR 303 or permission of department.* Staff

321 Labor Problems *I, 3*
The historical development of labor unions and the 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 investments in the human agent as a factor in economic growth. *(Lec. 3) Prerequisite: ECN 126 or permission of instructor.* Schmidt

407 Administrative Practices *I, 3*
Administrator in various departments of the business organization, understanding of work group behavior, barriers to communication, work simplification, degree of centralization, and the administrator as an agent of organizational change. Individual reports on case studies required. *(Lec. 3) Prerequisite: OMR 301 or permission of instructor.* Staff

422 Labor Legislation *II, 3*
Economics of welfare legislation, particularly old age and unemployment compensation provisions of the Social Security Act, and provisions of the Workmen's Compensation Acts, with particular emphasis on the impact of the acts on the Rhode Island labor force and economy. Effects of wage and hour law, minimum wage law, and child labor laws. *(Lec. 3) Prerequisite: ECN 126 or permission of instructor.* Schmidt

423 Industrial Relations *II, 3*
Public interest in labor relations and problems involved in effectuating collective bargaining. Major adjustments of management to changes in labor policy of federal and state governments, community and labor unions. *(Lec. 2, Lab. 2) Prerequisite: OMR 301.* Schmidt, Kaiser and Raffaele

431 Advanced Management Seminar *I, 3*
Integrated approach to problems in major areas of business management with emphasis on administrative and executive viewpoint. *(Lec. 3) Prerequisite: OMR 301.* Kaiser and Raffaele

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 management, with application to specific individual projects. *(Lec. 3) Prerequisite: permission of department.* Staff

504 Business Policy *II, 3*

530 (930) Principles of Management *I and II, 3*

PHARMACOGNOSY (PCG)

CHAIRMAN: Professor Worthen

445, 446 General Pharmacognosy *I and II, 3*
Natural products of biological origin as important pharmaceuticals. Sources, process of isolation and general fundamental properties. *(Lec. 3) Prerequisite: CMH 226, BIO 101, BIO 102 or equivalent.* Youngken, Worthen, and Lyon

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) Prerequisite: CHM 226, BIO 101, BIO 102 or equivalent.* Staff

459 Public Health *I and II, 3*
The principles of prevention and control of disease and the application of this information to current health problems. *(Lec. 3) Prerequisite: BAC 201, PCG 446 or permission of instructor.* Worthen and Cannon

497, 498 Special Problems *I and II, 1-3 each*
Methods of carrying out a specific research project in pharmacognosy. Includes literature search, planning, laboratory work and the writing of an acceptable report. *(Lab. TBA) Prerequisite: permission of department.* Staff

521, 522 Seminar *I and II, 1 each*

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*

PHARMACOLOGY AND TOXICOLOGY (PCL)

CHAIRMAN: Professor DeFeo

221 Dental Therapeutics *I, 2*
Medicinal agents, their actions and therapeutic uses with special emphasis on those substances employed in dental practice. *(Lec. 2) For students in Dental Hygiene.* Fuller

225 Pharmaceutical Calculations and Introduction to Pharmacology
See Pharmacy 225.

226 Pharmacology and Therapeutics *II, 3*
Continuation of PCL 225 (PHC 225) with special emphasis on the properties, actions, uses, dosage and toxicology of drugs used in the treatment of disease. *(Lec. 3) Prerequisite: PCL 225. For students in the College of Nursing.* Fuller

321 The Chemical Environment of Man *II, 3*
Introduction to basic pharmacological concepts used to explain the response of the human body to chemical stimuli including certain medicinally useful drugs and chemicals which are misused or abused. Legislation pertaining to drugs and chemicals. *(Lec. 3) Prerequisite: sophomore standing and permission of department. Designed primarily for non-health science majors.* Staff

338 (or PHC 338) Pharmacology and Biopharmaceutics *II, 4*
Physio-chemical relationships underlying drug action

including biopharmaceutical approaches and clinical aspects of pharmacokinetics. *(Lec. 4) Prerequisite: third-year standing and approval of departments.* DeFeo and Paruta

441, 442 General Pharmacology *I and II, 3 each*
Action of drugs on physiological function with reference to responses by tissue systems. Toxic effects, mechanism of action and dosage. *(Lec. 3) Prerequisite: fourth-year standing or permission of department.* Staff

443, 444 General Pharmacology Laboratory *I and II, 1 each*
Effects of drugs on physiological function with reference to responses by tissue systems. Toxic effects, mechanism of action and dosage. *(Lab. 3) Prerequisite: fourth-year standing or permission of department.* Staff

453 Clinical Pharmacology and Toxicology *I, 3*
Presentation of advanced information concerned with modern drug usage in man. Specific areas include: principles and problems inherent in drug use and evaluation in man, drug interactions in man, and clinical toxicology and latrogenic disease. *(Lec. 3) Prerequisite: PCL 442 and 444.* Staff and Visiting Lecturers

497, 498 Special Problems *I and II, 1-3 each*
Methods of carrying out a specific research project in pharmacology. Literature search, planning, laboratory work and the writing of an acceptable report. *(Lab. TBA) Prerequisite: 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, 4*

550 Operant Analysis of Behavior *I, 3*

562 Psychopharmacology *II, 3*

564 Psychopharmacology Laboratory *II, 1-3*

572 Neural Bases of Drug Action *II, 3*

PHARMACY (PHC)

CHAIRMAN: Professor Ballard

225 (or PCL 225) Pharmaceutical Calculations and Introduction to Pharmacology *I, 2*
Introduction to drugs and mechanism of drug action and the mathematical concepts of dosage and strength. Emphasis on anti-infectives and anti-neoplastic agents is included *(Lec. 2) For students in the College of Nursing.* Fuller and Staff

333 General Pharmacy *I, 4*
Introduction to mathematical concepts, principles and processes encountered in the formulation and preparation of clinical dose forms. *(Lec. 3, Lab. 4) Prerequisite: third-year standing.* Osborne

338 Pharmacology and Biopharmaceutics
See Pharmacology and Toxicology 338.

344 Dose Forms *II, 4*
Classification and relationships of clinical dose forms, with emphasis on officially recognized and commercially important products in each group. Formulations and preparation techniques are applied in the laboratory. *(Lec. 3, Lab. 4) Prerequisite: PHC 333, fourth-year standing.* Osborne

351 Personal Cosmetics *I and 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) Prerequisite: PHC 334.* Osborne

353, 354 Physical Pharmacy *I and II, 3 each*
Physico-chemical principles and laws as they apply to pharmaceutical systems: equilibria, solubility phenomena, particle-size technology, rheology, stability testing. *(Lec. 3) Prerequisite: PHC 334.* Paruta

360 Hospital Pharmacy *II, 3*
Introduction to the practice of pharmacy in hospitals, including both professional and administrative activities. Field trips are taken to representative hospital pharmacies. *(Lec. 2, Lab. 3) Prerequisite: PHC 334.* Jeffrey and Gallina

383, 384 Dispensing Pharmacy *I and II, 4 each*
Problems in preparing and dispensing pharmaceuticals, applying principles of pharmacognosy, medicinal chemistry and pharmacology. Practical application of laws and regulations, formulation techniques, prescription specialties and drug information. *(Lec. 2, Lab. 6) Prerequisite: PHC 354.* Staff

425 History of Pharmacy *I and 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) Prerequisite: fourth- or fifth-year standing.* Osborne

451 Clinical Pharmacy *I, 3*
Clinical orientation to the practice of the health professions and to the patient within the community and in institutional settings with emphasis on the various clinical services, therapeutics, observation and participation in clinical rounds, conferences, and case studies. *(Lec. 2, Lab. 3) Prerequisite: fifth-year standing.* Jeffrey and Gallina

497, 498 Special Problems *I and II, 1-3 each*
Method of carrying out a specific research project in pharmacy. Literature search, planning, laboratory work and the writing of an acceptable report. *(Lab. 3-10) Prerequisite: permission of department.* Staff

499 Clinical Practicum *II, 6-12*
A faculty supervised practical experience involving selected community, hospital, and clinical pharmacies and health care delivery agencies which provide patient-oriented pharmaceutical services. *(Lab. 12-24) Prerequisite: fifth-year standing. Not for graduate degree program credit.* Staff

521, 522 Seminar *I and II, 1 each*

552 Advanced Clinical Pharmacy *II, 3*

PHARMACY ADMINISTRATION (PAD)

CHAIRMAN: Professor Campbell

203 Social and Professional Orientation to Pharmacy *I and II, 2*
Introduction to social and professional consideration facing the practicing pharmacist, including those matters directly related to patient case and interaction with allied health professions. *(Lec. 2)* Staff

351 Pharmaceutical Law and Ethics *I, 3*
Certain basic principles of law and ethics as applied to federal, state and local acts, regulation and practices encountered in course of professional duties. Specific attention given to liabilities of pharmacists in decisions and actions involving sale of medicinals, poisons, and narcotics. *(Lec. 3)* Campbell

405 Pharmacy Personnel Administration *I, 2*
Development of attitudes and methods of solving personnel problems in the retail pharmacy. *(Lec. 2) Prerequisite: permission of department.* Jacoff

406 Pharmacy Retailing *II, 4*
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, Lab. 2) Prerequisite: permission of department.* Jacoff

451 Pharmacy Administration Principles *II, 3*
Practical solutions to problems encountered in selection, location and management of pharmacies, their personnel, stock and equipment. *(Lec. 3) Prerequisite: fifth-year standing.* Campbell

453 Drug Marketing Principles *II, 2*
Modern methods of merchandising, agencies involved in marketing drug products; their functions, particularly as they affect the retail phase of professional practice. *(Lec. 2) Prerequisite: fifth-year standing, ECN 123 or 125.* Crombe

461, 462 Clinical Seminar *I and II, 1 each*
A composite of professional, technical, and sociological aspects of pharmacy, including an exposition of recent advances and developments in each of the pharmacy disciplines. *(Lec. 1) Prerequisite: fifth-year standing. Not for graduate degree program credit.* Staff

497, 498 Special Problems *I and II, 1-3 each*
Methods of carrying out a specific research project in pharmacy administration. Literature search, planning, laboratory work and writing of an acceptable report. *(Lab. 3-10) Prerequisite: permission of department.* Staff

570 Case Studies in Pharmacy Law *II, 3*

580 Prepaid Drug Plans *I, 3*

PHILOSOPHY (PHL)

CHAIRMAN: Professor Freeman

101 Logic: Principles of Reasoning *I or II, 3*
Some of the main fields of knowledge are defined and related in terms of the kinds of evidence and methods that are peculiar to each. Inductive and deductive logic are considered with an analysis of arguments and fallacies with the aim of developing and understanding responsible statement and belief. *(Lec. 3)* Staff

103 Introduction to Philosophy *I or II, 3*
Philosophical problems: how man knows and values; the foundations of morals; the nature of truth; the meaning of human existence. *(Lec. 3)* Staff

112 Ethics *I or II, 3*
Examination of the principles underlying man's moral behavior. The meaning of the good life, duty, right and wrong considered systematically and historically, and in relation to some personal and social problems. The aim is to understand such virtues as temperance, courage, justice, tolerance, prudence, together with the vices and misconceptions associated with them. *(Lec. 3)* Staff

118 The Philosophy of Communism *I or II, 3*
The essence of communism, the intellectual and ideological causes for its existence, and its implications with respect to the moral, religious and political heritage of the West. *(Lec. 3)* Staff

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

126 The Development of Christian Thought *II, 3*
History of religious and philosophical ideas to acquaint students with the development of the teachings of Christianity. Emphasis to meet needs and in-

terests of students. Historical nature of material suitable for liberal education without regard to student's religious affiliation. *(Lec. 3)* Staff

128 The Philosophy of Religion *I and II, 3*
Nature of religion: Hinduism, Judaism, Christianity, Buddhism, Mohammedanism; the nature of God, relation of faith to reason, problem of evil and human freedom; relation of religion to social movements. *(Lec. 3)* Staff

131 Oriental Philosophy *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

146 Existentialism *I and II, 3*
Contemporary existentialism, both religious and secular, by examining its historical antecedents, and such major contemporary representatives as Martin Heidegger, Jean Paul Sartre, Gabriel Marcel, and Karl Jaspers. *(Lec. 3)* Staff

251 Symbolic Logic *I or II, 3*
Selected topics in modern symbolic logic including calculus of propositions, predicate calculus and modal logics. Attention will be given to philosophical and mathematical aspects of the subject. *(Lec. 3)* Staff

321 (121) History of 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)* Staff

322 (122) History of 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

323 (123) History of Modern Philosophy *I, 3*
Survey of major thinkers and schools in modern times, including Descartes, Locke, Berkely, Hume, Leibnitz, Spinoza, Kant and Hegel. *(Lec. 3)* Staff

324 (124) History of Recent Philosophy *II, 3*
Survey of the more important philosophical developments during the last century: realism, pragmatism, existentialism, and certain other philosophical movements. *(Lec. 3)* Staff

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 according to their special interests. One or more written papers will be required. Work to be done through the guidance of instructor in conferences. *(Lec. 3) Course may be repeated for credit. Prerequisite: permission of department.* Staff

405 Aesthetics *I or II, 3*
Systematic exploration of the philosophical problems arising from human interest in the beauty of nature and in the products of the fine arts; the nature, and kinds, of arts; aesthetic norms and standards of criticism. *(Lec. 3) Prerequisite: junior standing.* 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. The work of Wittgenstein, the Logical Positivists, Linguistic Analysts and other contemporary thinkers will be discussed. *(Lec. 3)* Staff

441 Metaphysics *I or II, 3*
Systematic and historical study of the nature of metaphysics, including such topics as: causation, essence, mind, universal categories, presuppositions, and their relation to the arts and sciences. *(Lec. 3) Prerequisite: junior standing or permission of instructor.* Staff

442 Epistemology *I or II, 3*
Systematic and historical study of ways of knowing; kinds of knowledge; the physical and non-physical sciences. *(Lec. 3) Prerequisite: junior standing or permission of instructor.* Staff

502, 503, 504, 505 Tutorial in Philosophy *I and II, 3 each*

512 Seminar in Ethics and Value Theory *I or II, 3*

530 Philosophy of Plato *I or II, 3*

531 Philosophy of Aristotle *I or II, 3*

540 Philosophy of Augustine *I or II, 3*

541 Philosophy of Aquinas *I or II, 3*

551 Philosophical Logic *I or II, 3*

552 Philosophy of Science *I or II, 3*

560 British Empiricists *I or II, 3*

561 Continental Rationalists *I or II, 3*

570 Philosophy of Immanuel Kant *I or II, 3*

580 Nineteenth-Century Philosophy *I or II, 3*

581 Twentieth-Century Anglo-American Philosophy *I or II, 3*

590 Contemporary European Philosophy *I or II, 3*

PHYSICAL EDUCATION (PED)

COORDINATORS: Associate Professor Nedwidek (Physical Education for Men) and Professor Massey (Physical Education for Women)

510 Current Problems in Physical Education, Health, and Recreation *I, 3*

520 Curriculum Construction in Physical Education *II, 3*

530 Research Methods and Design in Health and Physical Education *I, 3*

540 Principles of Recreation Leadership *II, 3*

543 Outdoor Recreation and Education *I or II, 3*

550 Administration of Physical Education *II, 3*

560 Seminar in Health, Physical Education and Recreation *I, 3*

570 Major Health Problems and Curriculum Planning in Health Education *II, 3*

575 Perceptual-motor Education *I, 3*

580 Physical Education for the Mentally Retarded *I, 3*

581 Psychological Aspects of Physical Activity *II, 3*

585 Physical Education for the Atypical Child *I, 3*

591 Special Problems *I or II, 3*

PHYSICAL EDUCATION FOR MEN (PEM)

COORDINATOR: Associate Professor Nedwidek

101 Basic Physical Education *I and II, 1*
Suggested for freshman and sophomore men, beginning skills to be covered. May be elected by any male student. *(Practicum 3)* Activities include:

A —Archery, Beginners
B —Basketball Fundamentals
C —Fencing, Beginners
D —Golf, Beginners
E —Handball/Paddleball, Beginners
F —Handball/Squash, Beginners
G —Marksmanship, Basic
H —Paddleball/Squash, Beginners
J —Soccer/Volleyball, Beginners
K —Swimming, Beginners
L —Swimming for the Handicapped Student
M—Tennis/Paddleball, Beginners
N —Tennis/Squash, Beginners
P —Touch Football/Volleyball, Beginners
Q —Track and Field, Beginners
R —Volleyball/Badminton, Beginners
S —Weight Training/Conditioning, Beginners

102 Basic Physical Education *II, 1*
Suggested for freshman and sophomore men. Beginning skills to be covered. May be elected by any male student. *(Practicum 3)* Activities include:

A —Badminton/Tennis, Beginners
B —Baseball Fundamentals
C —Gymnastics, Beginners
D —Lacrosse
E —Sailing, Beginners
F —Skiing, Beginners
G —Square and Folk Dancing
H —Tennis/Handball, Beginners
J —Volleyball/Archery, Beginners
K —Volleyball/Softball, Beginners
L —Volleyball/Tennis, Beginners
M—Wrestling/Softball, Beginners

103 Participation in the University Marching Band *I, 1*
Maximum of 4 credits. Open to men and women. May not be substituted for required physical education courses. Staff

105, 106 Competition in Intercollegiate Athletics *I and II, 1 each*
Freshman year. The student must be listed on the coach's roster to receive credit. *(Practicum 4 minimum)* Staff

121 Soccer and Physical Conditioning *I, 1*
Theory and techniques of soccer and physical conditioning. *(Lab. 3)* Sherman and Henni

122 (or PEW 211) Aquatics *I and II, 1*
Inventory-testing provides instruction in watermanship from beginning through Water Safety Instructor Certification. Small craft and waterfront safety information provided in accordance with Rhode Island lifeguard policy. *(Lab. 3)* O'Leary and Maack

123 Foundations of Health
See Physical Education for Women 260.

124 History and Principles of Physical Education *II, 2*
Historical overview of physical education. Principles of physical education teaching stressed for professional orientation. *(Lec. 2)* Sherman

125 Tumbling and Stunts *I, 1*
Techniques of performing and teaching elementary through advanced tumbling, stunts and trampolining. *(Lab. 3)* Sherman and Henni

126 Basic Gymnastics *II, 1*
Fundamentals of apparatus, with emphasis on nomenclature, safety, skill and teaching progressions. *(Lab. 3)* Sherman and Henni

172 (or PEW 172) First Aid *I or 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)* Cole and Leathers

207, 208 Competition in Intercollegiate Athletics *I and II, 1 each*
Sophomore year. The student must be listed on the coach's roster to receive credit. *(Practicum 4 minimum)* Staff

241 Golf and Wrestling *I, 1*
Theory and technique of golf and wrestling. *(Lab. 3)* Cieurzo and Leathers

242 Badminton and Tennis *II, 1*
Theory and techniques of badminton and tennis. *(Lab. 3)* O'Donnell

243 Prevention and Care of Athletic Injuries and First Aid *I, 3*
Conditioning, use of physiotherapy equipment, massaging, taping and bandaging technique. Latest American Red Cross procedures with the opportunity to receive standard certification. *(Lec. 2, Lab. 2) Prerequisite: intended for physical education majors.* Cole and Cooke

244 Physical Education for the Elementary School *II, 2*
Emphasis on developing physical education programs for boys and girls according to physical criteria (age, height, weight, sex, health status) as well as grade level. *(Lec. 1, Lab. 2)* O'Donnell

247 Athletic Officiating *I, 2*
Theory, practice and techniques of officiating football and basketball. Practical experience in intramural athletics. *(Lec. 2)* Piez

248 Athletic Officiating *II, 2*
Theory, practice and techniques of officiating volleyball, soccer and baseball. *(Lec. 2, Lab. 2)* Piez

272 Advanced First Aid *I or II, 1*
Special skills relative to particular activities, i.e., skiing, aquatics, etc. A follow-up course to Standard First Aid. *(Lec. 1) Prerequisite: a current Standard Certificate.* Slader, Cooke and Cole

303 Basic Physical Education *I or II, 1*
Suggested for junior or senior men and students with advanced skills. May be elected by any male student. *(Practicum 3)* Activities include:

A —Archery, Advanced
B —Fencing, Advanced
C —Handball/Paddleball, Advanced
D —Handball/Squash, Advanced
E —Instructors Certification in Water Safety
F —Judo
G —Marksmanship, Advanced
H —Paddleball/Squash, Advanced
J —Recreational Aquatic Sports, Advanced
K —Senior Life Saving
L —Skin and Scuba Diving, Beginners
M—Soccer/Volleyball, Advanced
N —Swimming, Intermediate
P —Tennis/Paddleball, Advanced
Q —Tennis/Squash, Advanced
R —Touch Football/Volleyball, Advanced
S —Track and Field, Advanced
T —Volleyball/Badminton, Advanced
U —Weight Training/Conditioning, Advanced

304 Basic Physical Education *I or II, 1*
Suggested for junior or senior men and students with advanced skills. May be elected by any male student. *(Practicum 3)* Activities include:

A —Badminton/Tennis, Advanced
B —Diving and Water Stunts
C —Fundamentals of Competitive Swimming
D —Golf, Advanced
E —Gymnastics, Intermediate
F —LaCrosse, Advanced
G —Sailing, Advanced
H —Skiing, Intermediate and Advanced
J —Skin and Scuba Diving, Advanced
K —Swimming, Advanced
L —Tennis/Handball, Advanced
M—Volleyball/Archery, Advanced
N —Volleyball/Softball, Advanced
P —Volleyball/Tennis, Advanced
Q —Wrestling/Softball, Advanced

309, 310 Competition in Intercollegiate Athletics *I and II, 1 each*
Junior year. The student must be listed on the coach's roster to receive credit. *(Practicum 4 minimum)* Staff

339 Advanced Gymnastics *I, 1*
Continuation of instruction in apparatus skills employing more advanced techniques with positive emphasis on breakdown of complex movements. *(Lab. 3)* Sherman and Henni

351 Understanding Motor-development of the Elementary School Child *I, 3*
Associated physical factors involved in teaching skills to elementary school children. Emphasis placed upon types and sequence of activities along with teaching and learning facts appropriate to skill level. *(Lec. 3)* O'Donnell

352 Movement Education in Elementary Physical Education *II, 3*
Specialized movement in physical education in both graded and adaptive activities from kindergarten to upper elementary age. Particular attention is given to the analysis of physical development in specific skills and space orientation. *(Lec. 3) Prerequisite: ZOO 121 and 242, or permission of department.* O'Donnell

354 Curriculum Designs in Elementary Physical Education *II, 3*
Curriculum planning for the primary, intermediate and middle school with attention to the organization and implementation of elementary physical education programs. *(Lec. 3) Prerequisite: PEM 244 or permission of department.* O'Donnell

356 Methods and Materials in Health Education *I and II, 3*
Curricular materials for school and public health education; evaluation of techniques and current meth-

odology for use in elementary and secondary schools. *(Lec. 3)* DelSanto

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) Prerequisite: PEM 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)* Slader

359 Field Work in Health *II, 3*
Directed participation in community health education in cooperation with community health organizations. Weekly seminars. *(Lab. 6) Prerequisite: PEM 357 or permission of department.* DelSanto

360 (or PEW 210) Rhythm and Dance *II, 1*
Presentation of basic rhythms, folk and square dance. Techniques of teaching dance and experience in calling included. *(Lab. 3)* Slader and Leathers

362 Coaching of Track and Field *II, 2*
Theory, techniques and practice in coaching of track and field. *(Lec. 2, Lab. 2)* Sherman

363 Principles of Athletic Coaching *I, 3*
Principles of exercise physiology, leadership, and psychology applied to athletic coaching. Includes material on administration of athletics. *(Lec. 3)* Polidoro and Sherman

364 Coaching of Baseball *II, 2*
Theory, techniques and practice in coaching baseball. *(Lec. 2, Lab. 2)* J. Norris

365 Physical Education Observation and Assisting *I, 2*
Student assists faculty member in organizing and teaching in the physical education curriculum. Includes weekly discussion of experiences. *(Lec. 1, Lab. 3)* Polidoro

366 Physical Education Assisting *II, 1*
Student assists faculty member in organizing and teaching in the required physical education curriculum. *(Lab. 3)* Polidoro

367 (or EDC 367) School Health Program *I, 3*
Organization of the school health program in relation to the community health program. Emphasis on study of health instruction, health services and healthful school environment. *(Lec. 3)* DelSanto and Slader

368 (or EDC 368) Methods and Materials in Physical Education *II, 2*
Lecture and discussion of learning theory applied to methods of teaching physical education. Includes role of teacher in various stages of the learning process. Sources of resource materials included. *(Lec. 2)* O'Donnell

369 (or PEW 351) Tests and Measurements in Physical Education *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

370 Applied Anatomy and Kinesiology *II, 3*
Anatomical relationships which deal primarily with physical principles of leverage, angles, stance and locomotion. Includes mechanical and kinesiological analysis of human motion. *(Lec. 3) Prerequisite: ZOO 121.* Slader and Cooke

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)* Slader

374 Audiovisual Aids *II, 2*
Presentation of the values and uses of audiovisual materials in the teaching-learning situation. Practice in operating equipment and preparing various teaching aids is included. *(Lec. 1, Lab. 2)* Slader

380 Curriculum and Administration of Physical Education *I, 3*
Physical education curriculum design in elementary and secondary schools. Includes role of teacher as administrator of his classes and member of school faculty. *(Lec. 3)* Zarchen

382 Community Recreation *I, 2*
Principles and objectives of recreational program planning with a consideration of facilities, equipment and personnel. Particular attention directed toward development of recreation leadership. *(Lec. 2)* Leathers

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)* Leathers

384 Coaching of Football *I, 2*
Theory, techniques and practice in coaching football. *(Lec. 2, Lab. 2)* Nedwidek

386 Coaching of Basketball *I, 2*
Theory, techniques and practice in coaching basketball. *(Lec. 2, Lab. 2)* Staff

410 Adaptive and Corrective Physical Education *I, 3*
Introductory survey course in which the student investigates selected physical, intellectual, and emotional impairments that necessitate adaptations in programs of physical education. *(Lec. 3) Prerequisite: senior standing or permission of department.* Slader

411, 412 Competition in Intercollegiate Athletics *I and II, 1 each*
Senior year. The student must be listed on the coach's roster to receive credit. *(Practicum 4 minimum) Not for graduate degree program credit.* Staff

Note: Student teaching includes practicum in both elementary and secondary schools under the supervision of the department staff. See EDC 484 and 485.

PHYSICAL EDUCATION FOR WOMEN (PEW)

CHAIRMAN: Professor Massey

105 Beginner Elective Activity I *I and 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 and Hiking
D —Bowling
*E —Canoeing
F —Fencing
*G —Golf
H —Gymnastics
I —Sailing
J —Self-Defence
K —Skiing (snow)
L —Slimnastics
*M—Tennis
*N —Track and Field
P —Beginning Swimming
Q —Diving
R —Synchronized Swimming

106 Beginner Elective Activity II *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 and Square Dance
B —Modern Dance Technique
C —Modern Dance Composition
D —Classical Ballet
H —Basketball
*I —Flag Football
*J —Field Hockey
*K —Lacrosse
*L —Soccer (speedball, speed-a-way)
*M—Softball
N —Volleyball

172 First Aid
See Physical Education for Men 172.

* Indicates seasonal (1 quarter) activities. The second quarter is TBA.

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. *(Practicum 3)* Staff
All activities listed under PEW 105 and:
S —Intermediate Swimming
T —Advanced Swimming
U —Lifesaving
V —Instructor Training
W—Recreation Aquatic Activities

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 PEW 106. *(Practicum 3)* Staff

210 Rhythm and Dance
See Physical Education for Men 360.

211 Aquatics
See Physical Education for Men 122.

260 (or PEM 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. 2, Discussion 1)* Staff

270 Introduction to the History and Philosophy of Physical Education *II, 3*
Survey of historical development of physical education as an integral part of education and as a profession from ancient times to the present. Emphasis on development of educational philosophies within physical education and basic to current interpretations of the theory and practice of physical education for women. *(Lec. 3)* Massey

285 Principles of Teaching Physical Education *II, 2*
Principles of teaching elementary and secondary school physical education as an integral part of the total education of the student. Through an understanding of the basic concepts, general principles to guide the effective planning of physical education programs will be formulated. *(Lec. 2)* Crooker

290 Recreation Programs and Leadership *I, 2*
Principles and practice of leadership in social recreation situations. Overview of school and community programs; planning and conducting activities for children, youth and adults; developing personal resources for creativity. *(Lec. 1, Lab. 2)* Mandell

295 Physical Education in Elementary Schools *II, 2*
Techniques 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. 1, Lab. 2)* Mandell

300, 301 Theory of Teaching Team Sports *I and II, 2 each*
Analysis of methods and principles involved in teach-

ing various team sports. Class organization, teaching progression, and coaching techniques in sports. Practice in officiating and tests for sport ratings will be given. *(Lec. 1, Lab. 2)* Bricker

306 Outdoor Recreational Activities: Man in His Environment *II, 3*
Lecture and practicum study of back-packing, bicycling, camping, canoeing, horseback riding, mountain climbing, sailing, scuba diving; emphasizing skills, equipment, instruction centers, appreciation of natural areas. Laboratory requirement includes a 28-hour outdoor living project. *(Lec. 2, Lab. 2)* Staff

320 Kinesiology *II, 3*
Analysis of human motion based on anatomical, physiological and mechanical principles. Emphasis on application of these principles to fundamental movements and physical education activities. *(Lec. 3) Prerequisite: ZOO 121.* Bloomquist

324 Rhythmic Analysis and Accompaniment *II, 2*
Special emphasis on rhythmic and kinesthetic factors in movement. Study and use of various types of instruments for dance accompaniment with practical experience in the accompaniment of dance. *(Lec. 1, Lab. 2)* Cohen

328, 329 Theory and Teaching of Individual and Dual Sports *I and II, 2 each*
Analysis of methods and principles involved in teaching various individual and dual sports. History, techniques, strategy, teaching methods, and progression for various sports. Equipment, rules and etiquette. Students will be given supervised practical experience in each sport. *(Lec. 1, Lab. 2)* Clegg

331 Theory and Teaching of Dance *II, 2*
Methods, materials and techniques used in teaching dance. Theory and practical experience in developing the movement vocabulary. Emphasis on teaching progression, lesson planning and dance demonstration. *(Lec. 1, Lab. 2)* Cohen

341, 342 Techniques of Officiating *I and II, 3 each*
Presentation of current methods and techniques for officiating selected individual, dual, and team sports. Provides necessary training and practical experience for students to become nationally rated officials. *(Lec. 2, Lab. 2)* Staff

351 Tests and Measurements in Physical Education
See Physical Education for Men 369.

380 Organization and Administration of Physical Education *I and II, 3*
Techniques, methods and systems used in organizing and administering physical education programs. Special emphasis on various phases of women's programs in both public and private institutions. *(Lec. 3)* Massey

410 Corrective and Adapted Physical Education *I, 3*
Evaluation and planning of programs in physical education adapted to needs of atypical individuals. Application of anatomical and mechanical principles in detection and correction of faulty development and body mechanics. Emphasis on relationship to the medical field. *(Lec. 3) Prerequisite: senior standing or permission of department.* Bloomquist

495 Directed Study *I and II, 3*
Honors thesis or equivalent project, relating to physical education major. With faculty guidance, the student will determine problem and develop plan of study. Project may be completed in either one to two semesters, maximum credit three. *Prerequisite: admission to the honors program of the Department of Physical Education for Women.* Massey

Note: Student teaching includes practicum in both elementary and secondary schools under the supervision of the department staff. See EDC 484 and 485.

PHYSICS (PHY)

ACTING CHAIRMAN: Professor Dietz

102 Fundamental Physics *I, 3*
Fundamental principles of physics primarily for students of nursing. Non-mathematical qualitative course. Will not serve as a basis for advanced study in physics. *(Lec. 2, Lab. 2)* Stone

104 General Physics *II, 5*
Introductory course designed to present basic physics for the student enrolled in the Commercial Fisheries Program. *(Lec. 4, Lab. 3) Limited to students in the Fisheries and Marine Technology Program.* Staff

109 Introduction to Physics *I and II, 4*
Gives the student an appreciation of the physical environment and an introduction to the principles and theories of contemporary physics. *(Lec. 3, Lab. 2) Not open to students who have passed either PHY 111, 112, 213, or 214.* Dietz, Willis and Staff

111, 112 General Physics *I and II, 4 each*
PHY 111: mechanics, heat and sound. *PHY 112:* optics, electricity, magnetism and modern physics. Non-calculus presentation of fundamental physics. Suitable for prospective teachers, pre-medical and pre-dental students. *(Lec. 3, Lab. 2)* Quirk and Staff

213, 214 Elementary Physics *I and II, 3 each*
PHY 213: mechanics and thermodynamics. *PHY 214:* electricity, magnetism and wave phenomena. For students planning to major in one of sciences. It is recommended that MTH 141 and 142 be taken concurrently. *(Lec. 3) Registration in PHY 285, 286 is required.* Staff

223 Introduction to Acoustics and Optics *I and II, 3*
Intended primarily for students in the College of Engineering. Fundamentals of acoustical and optical phenomena, systems and instruments. *(Lec. 3) Prereq-*

uisite: MCE 162 and 263 to be taken concurrently. Staff

285, 286 Physics Laboratory *I and II, 1 each*
Selected groups of laboratory exercises applying to PHY 213 and 214. *(Lab. 3) Prerequisite: for PHY 286, PHY 213.* Staff

322 Mechanics *II, 3*
Introduction to Newtonian statics and dynamics using vector analysis. Application to various topics in physical mechanics. *(Lec. 3) Prerequisite: PHY 112 or 214.* Staff

331 Theory of Electricity and Magnetism *I, 3*
Intermediate course covering topics in fields of electricity and magnetism. *(Lec. 3) Prerequisite: PHY 112 or 214 (calculus may accompany it).* Staff

334 Optics *II, 3*
Geometrical and physical optics: thick lens optics, interference, diffraction, polarization. *(Lec. 3) Prerequisite: PHY 112 or 214.* Staff

340 Introduction to Modern Physics *I and II, 3*
Origin, development and current status of some of the more important concepts and theories of modern physics. Conduction of electricity through gases, properties of electrons, thermionic and photoelectric effects, elementary, quantum theory, atomic structure and atomic spectra, isotopes and nuclear physics. *(Lec. 3) Prerequisite: PHY 112 or 214. For students majoring in physics who wish a broad view of the current status of physics before beginning specialized courses or others who wish an extended knowledge beyond the usual elementary courses.* Staff

341 Modern Physics I *I and II, 3*
Kinetic theory, special relativity, wave and particle properties of matter and radiation, atomic structure and spectra. *(Lec. 3) Prerequisite: PHY 214 or 223.* Staff

342 Modern Physics II *I and II, 3*
Basic concepts and theories of solid state and nuclear physics. *(Lec. 3) Prerequisite: PHY 341.* Staff

381, 382 Advanced Laboratory Physics *I and II, 3 each*
Experiments in electrical measurements and electronics. *PHY 381:* classical experiments such as the Millikan Oil Drop and the measurement of e/m. Students are introduced to the careful handling and reduction of data. Special attention is given to precision of measurements and the accuracy of the results obtained. *PHY 382:* the fundamentals of vacuum tubes and transistors are considered. Attention given to basic electronic circuits, including rectifiers, amplifiers, cathode followers, multivibrators, etc. *(Lab. 6) Prerequisite: PHY 112 or 214.* Cuomo and Penhallow

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 and recommended for all senior physics majors.* Staff

406 Introduction to Atmospheric Physics *I, 3*
Application of basic classical physics to the study of atmospheric processes. *(Lec. 3) Prerequisite: PHY 112 or 214.* Penhallow

420 Introduction to Thermodynamics and Statistical Mechanics *II, 3*
Emphasis on the laws of thermodynamics and the properties of thermodynamic systems, kinetic theory of gases, molecular velocity distributions, transport phenomena, Maxwell-Boltzmann statistics. *(Lec. 3) Prerequisite: PHY 112 or 214, MTH 141 and 142.* Staff

421 Introduction to Theoretical Physics *I, 3*
Classical mechanics; motion of a particle, Lagrange's and Hamilton's equations, rigid bodies, elasticity and hydrodynamics. *(Lec. 3) Prerequisite: permission of department.* Staff

425 Acoustics *I, 3*
Mathematical theory of vibrating systems; harmonic wave motion. Among topics discussed are transmission and absorption of sound waves, microphones, psychoacoustics, underwater acoustics and ultrasonics. *(Lec. 3) Prerequisite: permission of department.* Cuomo

431 Introduction to Theoretical Physics *II, 3*
Introduction to electromagnetic theory and Maxwell's equations with applications to radiation and optics. *(Lec. 3) Prerequisite: permission of department.* Staff

451 Atomic and Nuclear Physics *I, 3*
Special relativity, black body radiation, photo effect, electron waves, Compton scattering, X-rays, atomic and nuclear magnetism, angular momentum and introductory Schrodinger wave mechanics. *(Lec. 3) Prerequisite: differential and integral calculus and PHY 340, or permission of department.* Staff

452 Nuclear Physics *II, 3*
Nuclear stability and binding energies, semi-empirical mass formula, radioactive decay, nuclear two-body problem including ground state of the deuteron and neutron-proton scattering, methods of acceleration and detection of nuclear particles, theory of the compound nucleus and low energy nuclear reactions with emphasis on the interaction of neutrons with nuclei, liquid drop model of nuclear fission, chain reactors, survey of high energy nuclear physics and meson theory of nuclear forces. *(Lec. 3) Prerequisite: PHY 451 or permission of instructor.* Staff

455 Introduction to Solid State Physics *II, 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) Prerequisite: permission of department.* Staff

483, 484 Laboratory and Research Problems in Physics *I and II, 3 each*
Thorough understanding of the instruments and methods of research in experimental physics. Experiments drawn from various fields such as spectroscopy, optics, astronomy, nuclear physics, acoustics, thermodynamics, ultrasonics, mechanics, etc. Student is encouraged to develop initiative by independent performance. Special attention given to data analysis and preparation of reports. *(Lec. 1, Lab. 6)* Cuomo and Willis

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. Prerequisite: permission of department.* Staff

510, 511 Mathematical Methods of Physics *I and II, 3 each*

520 Classical Dynamical Theory I *I, 3*

521 Classical Dynamical Theory II *II, 3*

522 Topics in the Physics of the Earth *II, 3*

530 Electromagnetic Theory I *I, 3*

531 Electromagnetic Theory II *I, 3*

550 Physical Acoustics *I, 3*

570 Quantum Mechanics I *I, 3*

571 Quantum Mechanics II *II, 3*

580 Graduate Laboratory *I and II, 3*

585 Acoustic Measurements *II, 1-2*

590, 591 Special Problems *I and II, 1-6 each*

PLANT AND SOIL SCIENCE (PLS)

CHAIRMAN: Professor Larmie

Note: the following courses include all those previously listed under Agronomy and Horticulture.

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) College of Resource Development students may take this course for elective credit only.* Sheehan

104 Plants, Man, and the Environment *II, 3*
Plants in their economic, esthetic and survival relationship to man and other animals. Basic information on the ecology, production, improvement, distribution and use of economic plants. *(Lec. 3)* Roberts

105 Plants, Man, and the Environment Practicum *II, 1*
Practical aspects of the culture, ecology, improvement and use of plants in the environment of man. *(Lab. 2) Prerequisite: concurrent registration in PLS 104 or permission of instructor.* Griffiths

137 Floral Selection and Arrangement *I, 1*
Lectures, demonstrations and practical experience in selection, care and arrangement of flowers and plants. *(Studio 2)* Larmie

212 Soils *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)* Sheehan

213 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 requirement. Latter part devoted to independent study. *(Lab. 2) Prerequisite: concurrent registration with PLS 212 or permission of instructor.* Sheehan

233 Floral Art *I, 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)* Larmie

234 Flower Garden Management and Floral Design *II, 3*
Culture and use of annuals and perennials in the home flower garden. Theory and practice of floral arrangement and garden layout and design with emphasis on shows and special uses. *(Lec. 1, Studio 4)* Larmie

242 Appreciation of Landscape Design *I and II, 3*
Introduction to theory and principles of landscape design as applied to the home. Property selection and climate control. Modern methods of property planning including the individual components of the completed landscape plan. *(Lec. 3)* Hindle

282 World Crops *II, 3*
Classification, origin and uses of crop plants. Influence of climate, soils and cultural factors on the production of crops used by man. Ecological distribution of important world crops. *(Lec. 3) Prerequisite: PLS 104 or BOT 111 or BIO 101.* Wakefield

306 Nursery Principles and Practice *I, 3*
Principles of woody plant production with emphasis on cultural practices. Consideration of growing, pruning, transplanting; including methods of digging, grading, storing, and marketing of plants. *(Lec. 2, Lab. 2) In alternate years, next offered 1974-75.* McGuire

311 Fruit Science *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 dwarf or semidwarf stocks. *(Lec. 3)* Shutak

324 Vegetable Science *II, 3*
Origin, culture, cultivars, fertility management, harvest, preservation and quality of vegetables for home gardens and small roadside stand operations. *(Lec. 2, Lab. 2)* Griffiths

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)* Shaw

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)* Duff

343 Techniques in Landscape Design *I, 3*
Exercises in the presentation of landscape concepts in graphic form. Emphasis is on drawing landscape plans for residential property, on arrangement of unit areas, and on ornamental plants suitable for specific landscape situations. *(Lec. 1, Studio 4)* Hindle

352 Herbaceous Plants *II, 3*
Identification, growth characteristics, culture and use of annuals, biennials and perennials for foliage and flowers in gardens and as house plants. *(Lec. 2, Lab. 2) In alternate years, next offered 1974-75.* Larmie

353 Fundamentals of Ornamental Plant Classification *I, 3*
Identification and description under fall conditions; classification and adaptation of the important trees and shrubs including the broadleaf evergreens and their value in ornamental plantings. *(Lec. 1, Lab. 4) Prerequisite: BIO 101 or BOT 111.* Hindle

401, 402 Plant and Soil Science Seminar *I and II, 1 each*
Presentation and discussion of current topics of concern to producers and consumers of plants and plant products including soil-plant relationships. *(Lec. 1) Prerequisite: senior standing.* Staff

405 Propagation of Plant Materials *II, 3*
Theoretical and practical study of propagation including grafting, budding, cuttage and seedage. *(Lec. 2, Lab. 2) Prerequisite: PLS 104, BOT 111 or BIO 101.* McGuire

411 Soil Chemistry *I, 3*
See Food and Resource Chemistry 411.

412 Soil Biochemistry *II, 3*
See Food and Resource Chemistry 412.

420 Crop Ecology *I, 3*
Environmental factors affecting growth of crop plants. Influence of management, climate and soil factors on energy relationships, inter-plant competition, crop adaptation, persistence and productivity. Student project required. *(Lec. 3) Prerequisite: BIO 101 or BOT 111, PLS 104.* Wakefield

432 Commercial Floriculture *II, 3*
Growing commercial greenhouse crops including production, timing and marketing. Each student is assigned a greenhouse project. *(Lec. 2, Lab. 2) Prerequisite: PLS 104 and 331 and junior standing.* Larmie

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) Prerequisite: PLS 341 or equivalent.* Duff

444 Environmental Aspects of Landscape Design *II, 3*
Relationships between principles of landscape design and elements of the environment that contribute to the development of ecologically based plans. Residential areas used for emphasis. Client conferences and specifications for woody ornamental plants. *(Lec. 1, Studio 4) Prerequisite: PLS 343 and 353 or permission of instructor.* Hindle

450 Soil Conservation and Land Use *I, 3*
Application of soil survey interpretation as a tool in soil and water conservation and land use planning. Implications of soil properties and problems on land use considered with emphasis on urbanizing situations. *(Lec. 2, Lab. 2) Prerequisite: PLS 212 or permission of instructor.* Wright

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) Prerequisite: BIO 101 or BOT 111.* Hindle

461 Weed Science *II, 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) Prerequisite: PLS 212, organic chemistry, plant physiology desirable. In alternate years, next offered 1974-75.* Hull

468 Soil Genesis and Classification *I, 4*
Genesis, morphology, classification, and geographic distribution of soils. The broad principles governing soil formation are explained. Laboratory periods devoted largely to field trips to observe different types of soils. *(Lec. 3, Lab. 2) Prerequisite: PLS 212.* Wright

472 Plant Improvement *II, 3*
Breeding of economic crops with major emphasis on

vegetables, ornamentals, flowers and turfgrasses. The objectives and techniques of selection, pure line and hybridization breeding; quantitative variability; seed production; application of genetic principles to breeding problems. *(Lec. 2, Lab. 2) Prerequisite: ASC 352 or BOT 352. In alternate years, next offered 1974-75.* Griffiths

475 Plant Nutrition and Soil Fertility *II, 3*
The plant-soil system. Factors governing the availability and mobility of essential mineral nutrients in soil. Uptake, movement, and function of mineral elements and the organic nutrition of green plants. Laboratory includes soilless plant culture, ion interactions, radioisotopes, and deficiency symptoms. *(Lec. 2, Lab. 2) Prerequisite: BOT 111 or equivalent, PLS 212 and organic chemistry.* Hull

491, 492 Special Projects and Independent Study *I and II, 1-3 each*
Projects involving soils, plant nutrition, propagation, growth and development and garden design and site planning. Laboratory, library, studio, greenhouse, storage and field facilities are utilized. *(Lab. 3-9) Prerequisite: permission of department.* Staff

500 Growth and Development of Economic Plants *II, 3*

501 to 504 Graduate Seminar in Plant and Soil Science *I and II, 1 each*

573 Post-harvest Physiology of Economic Crops *I, 3*

576 Physiology of Plant Productivity *I, 3*

591, 592 Non-thesis Research in Plant and Soil Science *I and II, 1-3*

PLANT PATHOLOGY-ENTOMOLOGY (PLP)

CHAIRMAN: Professor Traxler

336 Fungi in the Environment and Economy *II, 3*
Case studies of agricultural and industrial problems involving the degradation of organic materials by fungi; wood decay, paper slimes, and textile mildew-proofing. Activities of soil fungi and mycorhizae. Industrial processes involving fungi: e.g., antibiotics, organic acids, foods, and mushrooms. *(Lec. 2, Lab. 2) In alternate years, next offered 1973-74.* Traxler

371 Insects of Turfgrasses, Trees and Ornamental Shrubs *I, 3*
Identity, injury, life cycle and methods of control of the principal insects attacking these groups of plants. *(Lec. 2, Lab. 2) In alternate years, next offered 1974-75.* Kerr

377 (or CVE 377) Biological Aspects of Water Quality *I, 3*
Basic concepts of water quality and use. Lectures, discussions and case histories of the causes of pollution. The methodology for qualitative and quantitative determination and toxicity bioassay. Water quality requirements, monitoring, and abatement. *(Lec. 2, Lab. TBA) Prerequisite: permission of instructor.* Staff from Civil and Environmental Engineering and Plant Pathology-Entomology

391, 392 Special Projects *I and II, 1-3 each*
Special work to meet individual needs of students in various fields of plant pathology and entomology, nematology, virology, agricultural or industrial mycology, biological aspects of water quality, bio-degradation and related subjects. *(Lec. and/or Lab. according to nature of the project) Prerequisite: permission of department.* Staff

442 Diseases of Turfgrasses, Trees and Ornamental Shrubs *II, 3*
Disease diagnosis, epidemiology, and control measures pertinent to these categories of plants. *(Lec. 3) Prerequisite: BOT 332 or equivalent or permission of instructor.* Jackson

482 (582) Nematology *II, 3*
Morphology, taxonomy, bionomics and physiology of plant parasitic, soil, and aquatic nematodes. Emphasis on host-parasite relationships, laboratory techniques and principles of control. *(Lec. 2, Lab. 2) Prerequisite: ZOO 111, BOT 332. In alternate years, next offered 1974-75.* Englander

561 Plant Virology *I, 3*

591, 592 Research Problems *I and II, 1-3 each*

Note: For other related courses see BOT 332, 432, 434 and ZOO 481, 482, 581, 586.

POLITICAL SCIENCE (PSC)

CHAIRMAN: Professor Warren

113 American Politics *I and II, 3*
Survey of the 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

116 International Politics *II, 3*
Nature of the state system, foundations of national power, means of exercising power in the interaction of states. Attention will be given to current international problems. *(Lec. 3)* Warren and Staff

301 Comparative European Politics *I and II, 3*
Analysis of concepts and methodologies relative to the study of comparative politics. Utilizing a structural-functional approach, survey of the formal and informal features of the political systems of Great Britain, France, Germany, U.S.S.R. and one other country. *(Lec. 3)* Milburn

341 Political Theory, Plato to Machiavelli *I, 3*
The major political philosophies from Plato to Machiavelli and their influence on such key concepts as justice, equality and political obligation. *(Lec. 3)* Killilea

342 Political Theory, Modern and Contemporary *II, 3*
Continuation of PSC 341. Machiavelli to Marx and Freud. *(Lec. 3) Required for majors in political science.* Killilea

353 Scope and Methods of Political Science *I, 3*
Development of political science as a discipline with explanation and analysis of fundamental political concepts and theories. *(Lec. 3) Prerequisite: PSC 113 and 116.* Leduc

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) Prerequisite: PSC 113.* Zucker

368 Public Opinion and Propaganda *I, 3*
Examination of public opinion and formative influences upon it; analysis of propaganda techniques. Role and implications of public opinion and propaganda in governmental processes. *(Lec. 3) Prerequisite: PSC 113.* Tyler

369 Legislative Process and Public Policy *II, 3*
Analysis of American legislative bodies, particularly Congress, with some attention to comparative legislatures. Structure, organization, and functions of Congress analyzed in relation to its role in determining public policy. *(Lec. 3) Prerequisite: PSC 113.* Zucker

403 Government and Society of India and Pakistan *I, 3*
Emphasis on South Asia, particularly India, focusing on historical, cultural and societal factors which shape and influence politics. Readings include autobiographies and novels by Indian writers, South Asian newspapers and journals, and studies of rural and urban problems. *(Lec. 3) Prerequisite: some other course in non-Western area or strong interest in India recommended.* Stein

407 The Soviet Union: Politics and Society *II, 3*
Analyses of the politics and society of the Soviet system; emphasized topics include the role of the Communist party, economic planning, ethnic minorities, the intelligentsia and the "new Soviet man." *(Lec. 3) Prerequisite: PSC 116 or Russian history course recommended. In alternate years, next offered 1973-74.* Staff

408 African Governments and Politics *I, 3*
Political developments in the new nations of sub-Saharan Africa. The main stress is functional: the role of parties as integrative forces; democratic centralism; one party states; African political thought and common developmental problems. *(Lec. 3) Prerequisite: PSC 113 and 116.* Milburn

411 The United States and China *II, 3*
Focuses on U.S.-China policy since World War II. Special attention will be given to American attitudes toward Nationalist China and Communist China; the role of public opinion in the making of foreign policy; interest groups and China; China and the United Nations, and major policy alternatives. *(Lec. 3) Prerequisite: PSC 113 and 116.* Tyler

420 Radical Change in the Modern Era *II, 3*
Colloquium on various forms of socio-political change in the twentieth century, with emphasis on the causes and dynamics of radical change, ideological trends, and movements, in Western and non-Western societies. *(Lec. 3) Prerequisite: upperclass or graduate standing and permission of instructor.* Stein

421 State and Local Government *I, 3*
Survey of the American state and local government, with emphasis on forms of government; politics; the organization of legislative, executive and judicial branches; metropolitan government and federalism. *(Lec. 3) Prerequisite: PSC 113.* 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) Prerequisite: PSC 116.* Warren

432 International Government *II, 3*
General development and basic principles 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) Prerequisite: PSC 116.* Warren

434 American Foreign Policy *II, 3*
Analysis of the institutions, techniques and instruments of policy-making and the execution of foreign policy. Some attention to the historical context and the role of international organization to foreign policy. *(Lec. 3) Prerequisite: PSC 116.* Tyler

443 Twentieth-Century Political Theory *I, 3*
Important political theorists of this century, particularly as they interpret the basis of this century, particularly as they interpret the basis of political obligation and weigh the question of violent political change. *(Lec. 3) Prerequisite: permission of department.* Killilea

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) Prerequisite: 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) Prerequisite: PSC 113.* Wood and Zucker

461 The American Presidency *I, 3*
Presidential leadership and decision-making, with emphasis on the growth in power and prestige of the presidency, the exercise of presidential influence in the conduct of government, and presidential initiative in formulating and developing national policies and priorities. *(Lec. 3) Prerequisite: PSC 113.* Wood

464 International Law *II, 3*
Fundamental aspects of international law: sources, treaties, international courts, recognition, territoriality, law of the sea, and conflict resolution. Case studies of international law in political decision-making. *(Lec. 3) Prerequisite: PSC 116.* Gamble

466 Urban Problems *II, 3*
Contemporary and emerging problems of urban affairs. Discussion, reading and assignments on the interaction between urban change, development of social institutions, and formation of public policy. *(Lec. 3) Prerequisite: PSC 113.* Wood and Zucker

470 Problems and Principles in the American Political Process *II, 3*
Theories and problems of contemporary politics with emphasis on power and policy formulation in the American political process. *(Lec. 3) Prerequisite: PSC 113, 116.* Zucker

471 (462) Constitutional Law *I, 3*
The Supreme Court as a political institution in American democracy. Systematic analysis of leading constitutional decisions exploring the adaptation of governmental powers to changed conditions of society, the development and function of judicial review, and the dynamics of decision-making in the Supreme Court. *(Lec. 3) Prerequisite: PSC 113.* Wood

472 (463) 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) Prerequisite: PSC 113.* Wood

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 will be placed on independent research. *(Lec. 3) Prerequisite: 6 credits in political science beyond PSC 113, 116.* Staff

483 Political Process: Policy Formulation and Execution *I or II, 3*
Inter-relationships of policy development and administration with particular attention devoted to participants in the process. Focus on specific activities of the executive branch and on government policies that affect the structure, composition, and function of the bureaucracy. *(Lec. 3) Prerequisite: permission of instructor.* Grossbard

486 Intentional Communities *II, 3*
Concepts and forms of community that are emerging in response to changes in political and socio-economic conditions and consciousness. Emphasis is placed on smaller units, e.g., intentional communities, cooperatives and communes, voluntary associations. *(Lec. 3) Prerequisite: PSC 113, 116 and one 300-level political science course.* 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) Prerequisite: PSC 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) Prerequisite: PSC 113 or PSC 116 or permission of department.* Milburn

498 Public Administration and Policy Formulation *II, 3*
Identification and analysis of factors which affect the formulation of public policy, including the roles of the executive, the bureaucracy, the legislature, and special interest groups. A special field of interest will be the evolution of the policy process, particularly at the state and local levels of government. *(Lec. 3) Prerequisite: PSC 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*

504 Politics of Developing Areas: Asia *II, 3*

507 The U.S.S.R. and China in World Affairs *I, 3*

510 Developing Nation-State: Africa *II, 3*

512 Seminar in Marine Science Policy and Public Law *II, 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*

553 Scope and Methods of Political Science *I, 3*

554 Advanced Research in Political Science *II, 3*

555, 556 Directed Study or Research *I and II, 3 each*

566 American Political Thought *II, 3*

568 Jurisprudence *II, 3*

572 Problems in International Relations *I, 3*

578 International Law and Politics of the Oceans *II, 3*

590 Internship in Public Administration *I and II, 3-6*

595 Problems of Modernization in Developing Nations *II, 3*

PORTUGUESE (POR)

SECTION HEAD: Assistant Professor McNab

101, 102 Elementary Portuguese *I and II, 3 each*
Communication at an elementary level through the aural, oral and written skills of Portuguese by means of class experience and language laboratory. *(Lec. 3)* Staff

103, 104 Intermediate Portuguese *I and II, 3 each*
Communication at an intermediate level through the aural, oral and written skills of Portuguese by means of class experience including the reading of Portuguese and Brazilian representative authors and language laboratory. *(Lec. 3) Prerequisite: POR 102 or equivalent.* Staff

205, 206 Advanced Portuguese *I and II, 3 each*
Continued development of facility in speaking, understanding, writing Portuguese. Frequent oral reports and written compositions, along with work in the language laboratory. *(Lec. 3) Prerequisite: POR 104 or equivalent.* McNab

301 (495) Civilization of Portugal *I, 3*
Introduction to Portugal from Roman times to the present. Survey of geographic, economic, social and political factors and their influence on the national expression in art, literature, and music. Lectures supplemented by assigned readings. *(Lec. 3) Prerequisite: POR 206 or permission of instructor. In alternate years, next offered 1974-75.* McNab

302 The Civilization of Brazil *II, 3*
Introduction to Brazil from colonial times to the present. Survey of the geographic, economic, social and political factors and their influence on the national expression in art, literature and music. *(Lec. 3) Prerequisite: POR 206, or permission of instructor. In alternate years, next offered 1974-75.* McNab

325, 326 Introduction to Portuguese Literature *I and II, 3 each*
Literary appreciation of Portuguese lyric poetry, drama, narrative, essay. Authors read include D. Dinis, Fernão Lopes, Gil Vicente, Camoes, Vieira, Bocage, Garrett, Herculano, Camilo, Antero, Eça, Cesario, Aquilino, Fernando Pessoa. *(Lec. 3) Prerequisite: POR 206 or permission of instructor. In alternate years, next offered 1973-74.* McNab

497, 498 Directed Study *I and II, 3 each*
Designed for the advanced student in Portuguese. Individual study and reports on problems of special interest. *(Lec. 3) Prerequisite: one of the following: POR 301, 302, 325, 326; acceptance of a project by a member of the staff and departmental approval. Not for a graduatae degree program credit.* McNab

PSYCHOLOGY (PSY)

CHAIRMAN: Professor Berger

103 Towards Self Understanding *I and II, 3*
Individual and social problems of normal persons. Discussion of personality development, social behavior and adjustive reactions with emphasis on increasing awareness of personal and interpersonal functioning. *(Lec. 3)* Grebstein, Prochaska and Staff

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

232 Developmental Psychology *I and II, 3*
Comprehensive understanding of human development and growth from birth to senescence. *(Lec. 2, Rec. 1) Prerequisite: PSY 113, sophomore standing.* Berk, Gross and Staff

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) Prerequisite: PSY 113, sophomore standing.* Berman, O'Keefe and Staff

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) Prerequisite: PSY 113, sophomore standing.* Berger and 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) Prerequisite: PSY 113, at least one course in mathematics at the college level, and sophomore standing.* Archer, Cain, Merenda and Staff

301 Introduction to Experimental Psychology *I and II, 3*
Lectures, demonstrations and laboratory experiments designed to introduce the student to the fundamental principles of experimental techniques applied in psychological research. *(Lec. 2, Lab. 2) Prerequisite: PSY 300.* Smith and Staff

310 History and Systems of Psychology *I and II, 3*
Rise and development of psychological research, psychological systems and specialized areas within psychology. *(Lec. 3) Prerequisite: PHL 103 or permission of department.* Silverstein

334 Introduction to Clinical Psychology *I and II, 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) Prerequisite: PSY 254, junior standing and permission of department.* Staff

361 Learning *II, 3*
Data, methods and principles involved in the experimental evaluation of the learning process in human and infrahuman organisms. *(Lec. 3) Prerequisite: PSY 301.* N. Smith and Staff

371 Laboratory in Learning *II, 1*
Laboratory experiments in learning designed to parallel course material in PSY 361. *(Lab. 2) Prerequisite: PSY 301.* N. Smith and Staff

381 Physiological Psychology *I and II, 3*
Physiological mechanisms operative in human behavior. Sensory, neural, endocrine and response systems as related to sensation, perception, emotions, motivation, learning and thinking. *(Lec. 3) Prerequisite: junior standing.* Swonger

391 Theories of Learning *I and II, 3*
The major psychological theories developed for explanation of experimental data in the area of learning. Topics include the evaluation of learning theories, their basic concepts and analysis of various behaviors in terms of the theoretical frameworks. *(Lec. 3) Prerequisite: junior standing or permission of instructor.* Silverstein

397 (399) Honors Seminar *I, 3*
Survey of recent advances in one major area of psychology with emphasis on integration with various other content areas in terms of theoretical positions and approaches. *(Lec. 3) Prerequisite: PSY 301, senior majors, permission of department, 3.0 overall GPA, 3.25 psychology GPA.* Staff

398 Honors Project *II, 3*
Independent project culminating in an honors thesis. Faculty supervisor provides guidance in delineating a problem within the major area of psychology surveyed in the honors seminar the preceding semester. *(Lec. or Lab. 3-6) Prerequisite: PSY 397, permission of instructor, 3.0 overall GPA, 3.25 psychology GPA.* Staff

410 Quantitative Methods in Psychology II *I and II, 3*
Utilization of quantitative procedures in studying psychological problems. Study of application of such techniques as one-way analysis of variance, topics in regression, correlation and non-parametrics. *(Lec. 3) Prerequisite: PSY 301, permission of department.* Cain and Staff

432 Advanced Developmental Psychology *II, 3*
Discussion of major issues in developmental psychology. Emphasis on research of Piaget, Erikson, Bruner, Kagan and Moss. Includes such topics as effects of infant care, sex typing, parental discipline and developmental aspects of intellective and perceptual growth. *(Lec. 3) Prerequisite: PSY 232.* Biller

434 Introduction to Psychological Testing *I and II, 3*
Major techniques used in measurement of intelligence, aptitudes, abilities, achievement, interest and personality. Laboratory will familiarize students with the nature and content of objective and projective tests. The reliability and validity of the various tests will be carefully considered. *(Lec. 2, Lab. 2) Prerequisite: education majors: PSY 113 and EDC 371 or PSY 300; psychology majors: permission of instructor, junior standing.* Zubrinski and Staff

435 The Psychology of Social Behavior *I and II, 3*
Concepts and principles of the behavior of individuals in the relation to social environment with emphasis on behavioral processes in the development of socialization. Special attention to motivation, language behavior, formulation and changes of attitudes and the norms established by various kinds of social groups. *(Lec. 3)* Lott and Staff

445 Group Processes and Individual Behavior *I and II, 3*
Systematic analysis of theories and research on the individual in the small face-to-face group; focus on interpersonal processes, group structure and dynamics. *(Lec. 3) Prerequisite: permission of instructor.* Lott

460 The Psychology of Violence and Aggression *I and II, 3*
Causal factors involved in understanding aggressive behavioral reaction from clinical, physiological, and social viewpoints. Methods used to deal with and change violent or aggressive behavior. *(Lec. 3) Prerequisite: PSY 113 and permission of instructor. In alternate years, next offered 1973-74.* Berman and Staff

461 Social and Psychological Aspects of Alcoholism *I and II, 3*
Causes and effects of alcoholism. Needs of those working with alcoholics, treatment and/or prevention of alcoholism. *(Lec. 3) Prerequisite: PSY 113, junior standing and permission of instructor. In alternate years, next offered 1973-74.* Willoughby and Staff

463 Psychology of Personal Meaning *I and II, 3*
Experiential and academic examination of the sources of meaning of human existence. Exploration of modes

for finding such meaning. *(Lec. 3) Prerequisite: PSY 113, junior standing, and permission of department.* Staff

479 Contemporary Problems for Modern Psychology *I and II, 3-12*
Central issues and recent developments in the field of psychology. Topics limited each semester to one of the following areas of psychology: (a) personality, (b) social, (c) learning, (d) methods and design, (e) developmental, (f) motivation, (g) perception, (h) clinical, (i) general, and (j) humanistic psychology. *(Lec. 3) A maximum of 4 semesters may be taken. Prerequisite: PSY 301, permission of department.* Staff

489, 499 Problems in Psychology *I and II, 3 each*
Advanced work in psychology. Courses will be conducted as seminars or as supervised individual projects. Students must obtain written approval from proposed faculty supervisor prior to registration. *(Lec. or Lab. TBA) Prerequisite: senior or graduate standing, permission of department.* Staff

510 Intermediate Quantitative Methods *I, 3*

520 Psychometric Methods *I and II, 3*

532 Experimental Design *I or II, 3*

534 Clinical Interpretation of Standardized Psychological Tests *II, 3*

542 The Exceptional Child *I or II, 3*

550 (or PCL 550) Operant Analysis of Behavior *I or II, 3*

RESOURCE DEVELOPMENT (RDV)

COORDINATOR: Associate Professor Kupa

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)* Kupa and Staff

101 Natural Resource Conservation Practicum *I, 1*
A field course designed to acquaint students with the broad resource problem areas in Rhode Island. Required for freshmen in Natural Resources. *(Lab. 2) Prerequisite: concurrent registration in RDV 100 and/or permission of instructor.* Kupa

300 Seminar in Contemporary Resource Problems *II, 2*
Selected local resource-use problems analyzed from the several viewpoints represented by the training of the students involved. *Prerequisite: senior standing in Natural Resources.* Owens and Staff

RESOURCE DEVELOPMENT EDUCATION (RDE)

444 Teaching of Agribusiness and Natural Resources
See Education 444.

486 (RDV 486) Internship in Agribusiness and Natural Resources *I and II, 3*
Supervised participation in programs related to agribusiness and natural resources. Students will devote full-time for four weeks working with selected individuals in order to develop further competency in the teaching of agribusiness and natural resources. *Prerequisite: concurrent enrollment in EDC 484, 485. Not for graduate degree program credit.* McCreight

491, 492 Special Problems in Adult Education *I and II, 1-3 each*
Specialized problems in adult and extension education. Conducted as seminars or as supervised individual projects. *(Lec. or Lab.) Prerequisite: permission of instructor.* Bromley or McCreight

RESOURCE ECONOMICS (REN)

CHAIRMAN: Professor Cummings

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)* Lampe

135 Fisheries Economics *I, 5*
Analysis of supply and demand for fish and fishery products. Cost and returns in harvesting and processing. Crew remuneration systems. Fisheries policy and management. *(Lec. 5) Prerequisite: permission of instructor. Designed for two-year fisheries program.* Holmsen

301, 302 Senior Seminar *I and II, 1 each*
Important current problems in resource economics and in research methods. *(Lec. 1) Prerequisite: senior standing.* Staff

310 (210) Man and Resource Use *I, 3*
Physical, institutional and organizational factors governing man's economic decisions to use resources. Relationships of rural (forest, wildland), urban (water, recreation), marine and mineral resources to the economy as economic institutions resolve resource use conflicts. Economic dimensions of public policy alternatives. *(Lec. 3) Prerequisite: ECN 126.* Norton

320 (220) Resource Conservation in the Modern Economy *II, 3*
Economic forces influencing the use of natural re-

sources by the private sector. Concepts of property and their relevance to conservation decisions. Role of public in conservation; direct and indirect methods of policy implementation. Origins, responsibilities and effectiveness in resource conservation of selected public agencies. *(Lec. 3) Prerequisite: REN 310 or permission of instructor.* McConnell

350 Contemporary Resource Use Conflicts *II, 3*
Economic factors affecting natural resource use. Application of basic economic theory to specific problems of a modern industrial society in managing its natural resources. Economic aspects of environmental quality. Various techniques for conflict resolution. *(Lec. 3) Prerequisite: ECN 428.* Staff

430 International Resource Development *II, 3*
Development of resources in rural communities with special attention to coastal zone and marine resource development in the developing nations: particularly in relation to national planning and to world trade. *(Lec. 3) Prerequisite: ECN 126 and junior standing or permission of instructor.* Weaver

441 Economics of Food Marketing *I, 3*
The development of marketing systems for food products; institutional considerations; marketing methods and services; costs and margins; market prices and price determination; marketing and pricing efficiency; types of competition; appraisal of alternative systems. Application of economic principles in analyzing marketing and pricing problems. *(Lec. 3) Prerequisite: REN 105 and permission of instructor. In alternate years, next offered 1973-74.* Wallace

450 Resource Policy and the Environment *II, 3*
Economic aspects of current resource policy problems in detail. Economic effects of recent changes in public attitudes, legislation, agencies and functions. Current research and its role in decision-making. *(Lec. 3) Prerequisite: permission of department.* Staff

491, 492 Special Projects *I and II, 3 each*
Advanced theory of agricultural marketing, agricultural and public policy, advanced production economics, advanced resource economics and advanced theory of choice. *Prerequisite: permission of department.* Staff

514 Economics of Marine Resources *I, 3*

527 Macroeconomic Theory *I, 3*

528 Microeconomic Theory *I, 3*

532 Land Resource Economics *II, 3*

534 Economics of Resource Development I *II, 3*

543 Economic Structure of the Fishing Industry *I, 3*

550 The Economics of Exhaustible Marine Resources *II, 3*

576 (or ECN 576, EST 576) Econometrics I *I, 3*

577 (or ECN 577, EST 577) Econometrics II *II, 3*

595 Problems of Modernization in Developing Nations *II, 3*

RESOURCE MECHANICS (REM)

CHAIRMAN: Professor Larmie (Plant and Soil Science)

201 Wood-working Methods *I, 3*
Principles and practice in various phases of carpentry to stimulate innovative thinking in use of wood in practices and processes related to plants, soils and resource development. Concrete work, sketching, lumber selection, wood fastening, painting, finishing, layout for rafters and stairs, and care and use of woodworking tools. *(Lec. 2, Shop 3)* Wilson

202 Metal-working Methods *II, 3*
Principles and practice in working with various kinds of metals to stimulate innovative thinking in their use related to machinery and apparatus used with plants, soils and in resource development projects. Shop equipment, soldering, brazing, forging, welding, cutting, shaping, drilling, threading, tapping, and turning. *(Lec. 2, Shop 3)* Wilson

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

362 Power Equipment *II, 3*
Functional components of machines (exclusive of the power unit) used for turfgrass maintenance and production of specialized crops. Principles and techniques of selection, operation, adjustment and maintenance of machinery. *(Lec. 2, Lab. 2) In alternate years, next offered 1973-74.* McKiel

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 is considered. *(Lec. 2, Lab. 3) Prerequisite: MTH 109 or equivalent.* McKiel

484 Structures *II, 3*
Principles of design and construction of buildings and structures related to culture of plants, managing soils and resource development. Planning, materials, construction components, environmental control and waste disposal. *(Lec. 3) Prerequisite: MTH 109 or equivalent or permission of instructor. In alternate years, next offered 1974-75.* McKiel

491, 492 Special Projects and Independent Study *I and II, 1-3 each*
Laboratory, library and field facilities are available for special projects concerned with resource mechanics. *(Lab. 3-9) Not for graduate degree program credit. Prerequisite: permission of department.* McKiel or Wilson

RUSSIAN (RUS)

SECTION HEAD: Assistant Professor Aronian

101, 102 Elementary Russian *I and II, 3 each*
Fundamentals of grammar and pronunciation; exercises in reading, writing, and conversation. *(Lec. 3)* Staff

103, 104 Intermediate Russian *I and II, 3 each*
Development of facility in reading texts of moderate difficulty; supplemented by further work in grammar, conversation, and composition. *(Lec. 3) Prerequisite: RUS 102.* Staff

205, 206 Conversation and Composition *I and II, 3 each*
Development of facility in speaking, understanding, and writing Russian, oral reports on articles read in newspapers and periodicals and frequent written compositions. *(Lec. 3) Prerequisite: RUS 104.* Staff

325, 326 Readings in Russian Literature *I and II, 3 each*
Selected readings in poetry and the short story from the late eighteenth century to the present. Authors studied include Karamzin, Pushkin, Lermontov, Tyutchev, Gogol, Turgenev, Cvetaeva, Mayakovsky, Zamyatin, Olesha, Zoshchenko and Pasternak. *(Lec. 3) Prerequisite: RUS 104. In alternate years, next offered 1974-75.* Aronian

391, 392 Masterpieces of Russian Literature *I and II, 3 each*
Russian literature of the nineteenth and twentieth centuries with emphasis on the development of the Russian novel. Readings in translation. *(Lec. 3) May not be used for credit toward major or minor in Russian.* Driver

460, 461 The Russian Novel *I and II, 3 each*
Development and technique of the novel in the works of Pushkin, Lermontov, Gogol, Goncharov, Turgenev, Tolstoy, Dostoevski, Leskov, Sologub, Sholokhov and Pasternak. *(Lec. 3) Prerequisite: RUS 104. In alternate years, next offered 1973-74.* Staff

SCRATCH (SCR)

COORDINATOR: Instructor S. Beckman

OOOW Basic Composition *I and II, 1-3*
Writing instruction and practice directed toward the development of ability and assurance in the organization of ideas and the use of language. 5, 10, or 15 weeks. Enrollment in first week only. *(Practicum 1-3)* Staff

OOOX College Writing *I and II, 1-3*
Instruction and practice in the various types of written work customarily required in college courses. Intermediate level. Enrollment in first week only. *(Practicum 1-3)* Staff

OOOY Advanced Composition *I and II, 1-3*
Principles of writing non-fiction prose and practice in their application. For students who have mastered basic elements of composition. Credits determined by the amount of work completed. *(Practicum 1-3)* Staff

OOOZ Research Paper Writing *I and II, 3*
Instruction and practice in the formal presentation of research in primary and secondary source materials. Enrollment in first week only. *(Practicum 3)* Staff

SOCIAL WELFARE (SWF)

CHAIRMAN: Professor Rosengren (Sociology and Anthropology)

311 Introduction to Social Work *I and II, 3*
Growth and development of social work concepts, philosophies and procedures under voluntary and public auspices. *(Lec. 3) Prerequisite: SOC 202 or 204, sophomore standing.* Maynard

313 Social Welfare Services *I and 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) Prerequisite: SWF 311 and one of the following: ECN 123, HIS 142, PSC 113, junior standing.* Maynard

317 Social Work Methods *I and II, 3*
Principles and methods of casework, with emphasis on understanding and aiding individuals and families faced with personal-social difficulties. Nature and varieties of group work. *(Lec. 3) Prerequisite: SOC 204 and SWF 313, PSY 235 or 254, or CDF 390, permission of department.* Maynard

SOCIOLOGY (SOC)

CHAIRMAN: Professor Rosengren (Sociology and Anthropology)

202 General Sociology *I and II, 3*
Introductory description and analysis of the structure and dynamics of human society. Social norms, groups, intergroup relations, social change, stratification, and institutions. *(Lec. 3)* Staff

204 Social Psychology *I and II, 3*
Examination of social basis of personality development and behavior. Man's symbolic environment, the

self and the group motivation, attitudes and beliefs, social roles. *(Lec. 3)* Staff

206 Development of Human Societies *I and II, 3*
A sociological perspective in which whole societies are the unit of analysis. The succession of hunting and gathering, horticultural, agrarian and industrial societies. Social change is central to this approach and focus is on the place of technology in the changing socio-cultural pattern. *(Lec. 3)* Staff

208 Issues and Problems in Contemporary American Society *I and 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)* Staff

301 Introduction to Methods of Sociological Research *I and II, 3*
Scientific method in sociological research. Table construction and interpretation, research design, sampling, measurement, and data collection techniques. Emphasis on critically reading and evaluating sociological research. *(Lec. 3) Prerequisite: one 200-level course.* Bassis

310 Rural Sociology *II, 3*
Population and culture in rural United States; emphasis on analyzing the life of people in a rural environment as an integral part of contemporary organized society. *(Lec. 3) Prerequisite: SOC 202.* Spaulding

312 The Family *I, 3*
The family as a social institution, featuring its uniformity and variability in historical time and social space. Particular emphasis on contemporary American family. Variation in the institutional patterns by rural-urban residence, region, race and social class. Issues and conflicts in the contemporary family scene. *(Lec. 3) Prerequisite: SOC 202.* Staff

314 Juvenile Delinquency *II, 3*
Causes of delinquency; juvenile courts and probation; correctional institutions; programs of prevention. *(Lec. 3) Prerequisite: SOC 202.* England

324 Medical Sociology *I, 3*
Problems of health, illness, and medicine in relation to the social order; organization of medical institutions and professions; distribution of illness in societies; social psychological factors in illness. *(Lec. 3) Prerequisite: 6 credits in sociology or anthropology including SOC 202 or APG 203.* Rosengren

330 Criminology *I, 3*
Nature and extent of crime; past and present theories of crime causation; criminal behavior in American society and its relation to personal and cultural conditions. *(Lec. 3) Prerequisite: SOC 202.* England

336 Social Stratification *II, 3*
Dimensions and dynamics of inequality in society; concepts of class and status; processes of social mobility. *(Lec. 3) Prerequisite: SOC 202.* Gersuny

338 Population Problems *I, 3*
Problems in the growth, decline, and composition of populations. Effects of fertility, mortality, migration, etc. Special attention to American society. *(Lec. 3) Prerequisite: SOC 202 or APG 203.* Bouvier

340 Minority and Majority Relations *II, 3*
Relations between the various ethnic, religious, racial and political minorities and majorities, with special reference to the United States. *(Lec. 3) Prerequisite: SOC 202.* Staff

370, 371 Seminars *I and II, 3 each*
Designed to cover areas of special research interests of graduate and undergraduate students not covered in other courses. May be taken as honors courses. *(Lec. 3) Prerequisite: permission of department.* Staff

408 Industrial Sociology *I, 3*
Work and the organizations of industry, work roles, work groups, and authority structures; labor-management relations; some aspects of industrialization. *(Lec. 3) Prerequisite: 6 credits in sociology or anthropology, including SOC 202 or APG 203.* Gersuny

410 Complex Organizations in Modern Society *II, 3*
Role of large formal organizations in contemporary society: schools, hospitals, welfare institutions, administrative agencies, and others dealing with clients. Structure of organizations, their relations to one another and to their community settings. *(Lec. 3) Prerequisite: 6 credits in sociology or anthropology, including SOC 202 or APG 203.* Rosengren

412 Occupations, Professions, and Social Structure *I and II, 3*
Historical changes in work patterns, variability in the nature of work among occupations and between occupations and professions, career and mobility patterns, reciprocal relations between an individual's occupational status and his participation in other societal institutions. *(Lec. 3) Prerequisite: one 200-level and one 300-level sociology course.* Gelles

414 Demography *I or II, 3*
Vital statistics and their consequences for social structure and social change. Analysis of demographic techniques as applied to the measurement of fertility, mortality, morbidity and migration. Development of methods for estimating population projections. *(Lec. 3) Prerequisite: SOC 338 or permission of department.* Bouvier

416 Seminar in Criminology *II, 3*
Critical survey of criminological/penological theories and research, with emphasis upon the work of contemporary sociologists. Relevance of this work to correctional and preventive programs. Discussions, oral

and written reports. *(Lec. 3) Prerequisite: SOC 330 or permission of instructor.* England

420 Sociology of the Environment *II, 3*
Analysis of sociological and political factors in environmental deterioration. Ideological roots of the ecological crisis, issues in the administration of pollution control, patterns of conflict and cooperation in case studies of environmental pollution, organization and internal division of the ecology movement, and the problem of priorities in ecological planning. *(Lec. 3) Prerequisite: SOC 202 or APG 203 or permission of instructor.* Staff

430 Social Pathology and Social Change *I, 3*
Pathological characteristics as aspects of social change; social structure analyzed as relevant to development of slums, migration, crime, delinquency, divorce, poverty, alcoholism, suicide, drug addiction, and mental deficiency and disorder. *(Lec. 3) Prerequisite: SOC 202, 204.* Spaulding

432 Ecology of the Community *I or II, 3*
Spatial and temporal organization of communities. Consideration of the relations between man and his environment, as well as a survey of community, ecological and power structure studies. *(Lec. 3) Prerequisite: SOC 202.* Staff

434 Urban Sociology *I, 3*
Patterns of urban development, taking into account sociological characteristics of urban life. Problems of urban redevelopment and planning. *(Lec. 3) Prerequisite: SOC 202.* Staff

436 Sociology of Politics *II, 3*
Social and cultural contexts of contemporary politics. Functions and problems of mass, class and power group participation in politics. Conditions and outlook for democracy in large societies. *(Lec. 3) Prerequisite: SOC 202.* Gardner

438 Aging and Society *I, 3*
Sociological features of the aging process. The physiological and psychological bases of aging. The major social institutions and the impact of significant social trends. *(Lec. 3) Prerequisite: SOC 202; SOC 312 desirable.* Staff

440 The Sociology of Mental Illness *I and II, 3*
Sociological theory and data on the socio-cultural aspects of mental illness. The phenomenon of mental illness considered in historical and cross-cultural perspective. Social correlates of different types of frequencies of mental illness and recent sociological research on mental illness as a social role. *(Lec. 3) Prerequisite: SOC 202 or 204 and one 300-level course.* Travisano

442 The Sociology of Education *I and II, 3*
Social organization of education as an institution, analysis of the antecedents and consequences of education, application of sociological psychological theory to educational systems and processes. *(Lec. 3) Prerequisite: one 200- and one 300-level course in sociology.* Bassis

444 The Sociology of Religion *I and II, 3*
Sociological theory and research in the analysis of inter-relationships between religious culture, secular culture, the social structure of religious groups, and general social structure. *(Lec. 3) Prerequisite: one 200- and one 300-level course in sociology.* Sennott

446 Sociology of Knowledge *I and II, 3*
Survey of theories and research on the social bases of ideas. Emphasis on the works of Durkheim, Mannheim, and Marx and their influences on "common sense" interpretations of social life. *(Lec. 3). Prerequisite: one 200- and one 300-level course in sociology.* Sennott

448 Sociology as a Science *I and II, 3*
Survey of materials on social conditions affecting the pursuit of scientific investigation. Topics include the social role of the scientist and the social correlates of the scientific worldview. *(Lec. 3) Prerequisite: one 200- and one 300-level course in sociology.* Sennott

492 History of Sociological Thought *I, 3*
Development of sociology as reflected in writings of American and European scholars: Plato, Aristotle, Rousseau, Vico, Spencer, Durkheim, Marx, Weber, Veblen, R. Merton, Parsons, and others. *(Lec. 3) Prerequisite: 12 credits of sociology.* Gardner

496 Advanced Sociological Research *II, 3*
Advanced techniques of sociological research and their application by participation in a research project. *(Lec. 3) Prerequisite: SOC 494 or permission of department.* Staff

502 Contemporary Sociological Theory *II, 3*

508 Individual and Social Organization *I or II, 3*

510 Seminar in Deviance *I or II, 3*

512 Concepts of Social Structure *I or II, 3*

514 Issues and Problems of Bureaucracy *II, 3*

571, 572 Seminars *I and II, 3 each*

595 Problems of Modernization in Developing Nations *II, 3*

SPANISH (SPA)

SECTION HEAD: Professor Hutton

101, 102 Elementary Spanish *I and II, 3 each*
Involvement of the student at an elementary level in the spoken and written use of the Spanish language through class experience and language laboratory. *(Lec. 3)* Staff

103, 104 Intermediate Spanish *I and II, 3 each*
Involvement of the student at an intermediate level in the spoken and written use of the Spanish language through class experience and language laboratory, combined with the reading of Spanish and Hispanic-American representative authors. *(Lec. 3) Prerequisite: SPA 102 or equivalent.* Staff

205, 206 Advanced Spanish *I and II, 3 each*
Emphasis on correct and mature expression in conversation and composition in Spanish with continued emphasis in the skill of reading. *(Lec. 3) Prerequisite: SPA 104 or equivalent.* Hutton

325, 326 Introduction to Literary Studies in Spanish *I and II, 3 each*
Basic courses examining Hispanic literature through works representative of significant literary and cultural movements and specifically Spanish themes and mythic figures. Elements of critical methods. *(Lec. 3) Prerequisite: SPA 206, or may be taken concurrently with SPA 205 or 206 by permission of instructor.* Navascués

391, 392 Masterpieces of Spanish Literature *I and II, 3 each*
Course offered in English. Reading and analysis of Spain's most significant contributions to world literature encompassing poetry, novel, drama and essay. All works read in English translation. Works through the seventeenth century in the first semester; those of the nineteenth and twentieth in the second. *(Lec. 3) May not be used for credit toward a concentration in Spanish.* Freedman

407 Intensive Practice in Conversation *I, 3*
Intensive practice in spoken Spanish and an introduction to Hispanic-American culture. *(Lec. 3) Prerequisite: 21 credits in Spanish or permission of department. Recommended for teachers or seniors in the general teacher education curriculum concentrating in Spanish. In alternate years, next offered 1974-75.* Staff

408 Conversation and Teaching Materials *I, 3*
Practice in spoken Spanish and an introduction to Spanish culture. Review of materials and textbooks available for effective teaching. *(Lec. 3) Prerequisite: 21 credits in Spanish or permission of department. Recommended for teachers or seniors in the general teacher education curriculum concentrating in Spanish. In alternate years, next offered 1973-74.* Hutton

409 History of the Spanish Language *II, 3*
Linguistic development of Castilian from the earliest documents to the present. Ibero-Romance dialects. New World Spanish. Hispano-Judaic dialects. *(Lec. 3) Prerequisite: SPA 325 or 326. In alternate years, next offered 1973-74.* Rogers

410 Field Workshop *Summer, 6*
Cultural visit to Spain or Hispanic-America. Significant monuments and places of interest to the student of literature and civilization will be studied. Lectures supplemented by assigned reading. *(Lec. 6) Prerequisite: SPA 325 or 326, or permission of instructor.* Staff

430 Castilian Literature of the Sixteenth and Seventeenth Centuries *II, 3*
Literary significance of the Renaissance and Baroque periods and an analysis and critical examination of the works of the principal writers of this Golden Age of Castilian literature. *(Lec. 3) Prerequisite: SPA 325 or 326, or permission of instructor.* Hutton

450 Neo-Classicism and Romanticism *I, 3*
Transformation of national traditions and the introduction of neo-classicism in eighteenth-century Spain, and the significant works of the Romantic movement, particularly in the theater, lyric poetry and *costumbrista* literature in nineteenth-century Spain. *(Lec. 3) Prerequisite: SPA 325 or 326, or permission of instructor. In alternate years, next offered 1973-74.* Kossoff

451 The Spanish Novel of the Nineteenth Century *I, 3*
Development of Realism and Naturalism in the novel of the second half of the nineteenth century in Spain. *(Lec. 3) Prerequisite: SPA 325 or 326, or permission of instructor. In alternate years, next offered 1973-74.* Kossoff

461 The Generation of 1898 *I, 3*
Precursors of the Generation of 1898 and the major literary works of this group of writers including the contributions of Benavente, Unamuno, Antonio Machado and Azorin. *(Lec. 3) Prerequisite: SPA 325 or 326, or permission of instructor. In alternate years, next offered 1974-75.* Navascués

462 Contemporary Spanish Writers *II, 3*
Spain as seen through the works of major contemporary figures beginning with Garcia Lorca and the Generation of 1927. *(Lec. 3) Prerequisite: SPA 325 or 326, or permission of instructor. In alternate years, next offered 1974-75.* Freedman

471, 472 Introduction to Hispanic-American Literature *I and II, 3 each*
Reading and critical study of the major literary works of Hispanic-America, from the historians of the Spanish colonial era to the contemporary writers of the independent, Spanish-speaking American nations. *(Lec. 3) Prerequisite: SPA 325 or 326, or permission of instructor. SPA 472 recommended for students with a concentration in Spanish. In alternate years, next offered 1974-75.* Staff

481 Don Quijote *I, 3*
Understanding of the life and times of Miguel de Cervantes Saavedra and the reading and critical interpretation of his work, *El ingenioso hildalgo Don Quijote de la Mancha. (Lec. 3) Recommended for students with a concentration in Spanish. Prerequisite: SPA 325 or 326, or permission of instructor. In alternate years, next offered 1974-75.* Hutton

483 The Origins of the Novel in Spain *I, 3*
Development of forms of prose fiction from the period of the Reconquest to Cervantes; the sentimental, picaresque and pastoral novels, the novels of chivalry, and the translations and immitations of the Greek romances of adventure. *(Lec. 3) Prerequisite: SPA 325 or 326, or permission of instructor. In alternate years, next offered 1973-74.* Kossoff

485 The Modern Spanish Novel *II, 3*
Representative works from the Generation of 1898 to the most recent authors: Valle-Inclán, Baroja, Pérez de Ayala, Cela. *(Lec. 3) Prerequisite: SPA 325 or 326, or permission of instructor. In alternate years, next offered 1973-74.* Kossoff

488 The Drama of the Golden Age *II, 3*
Spanish theater from the early Renaissance through the Baroque with special attention to the works of Lope de Vega and Calderón and their schools. *(Lec. 3) Prerequisite: SPA 325 or 326, or permission of instructor. In alternate years, next offered 1974-75.* Kossoff

495 Hispanic Civilization *II, 3*
Analysis of Hispanic culture and civilization from fifteenth century to present. Significant contributions in literature and the arts. Readings in all areas of Hispanic endeavor supplemented by individual projects. *(Lec. 3) Prerequisite: SPA 325 or 326, or permission of instructor. In alternate years, next offered 1974-75.* Hutton

497, 498 Directed Study *I and II, 3 each*
Designed particularly for the advanced student. Individual research and reports on problems of special interest. *Prerequisite: SPA 325 or 326; acceptance of a project by a member of the staff and departmental approval.* Staff

511 Spain during the Reconquest *I, 3*

512 Spanish Literature of the Fifteenth Century *II, 3*

573 Modern Hispanic-American Poetry *I, 3*

574 Hispanic-American Novel *II, 3*

582 Cervantes: Theater and Novels *II, 3*

583 The Spanish Baroque *I, 3*

584 Spanish Problematic Literature *II, 3*

591 Introduction to Research and Criticism *I, 3*

592 Religious Sources of Hispanic Literature *II, 3*

594 Seminar in Spanish Literature *I and II, 3*

SPEECH (SPE)

CHAIRMAN: Professor Doody

101 Fundamentals of Oral Communication *I and II, 3*
Development and integration of skills and attitudes essential to effective and responsible participation in typical communication situations. Emphasis on clear diction, proper use of voice, reading aloud, and the fundamentals of speech organization and presentation. Students demonstrating initial proficiency may petition for alternate placement beyond the fundamentals level. *(Lec. 3)* Staff

102 Public Speaking *II, 3*
Adaptation of traditional rhetorical doctrines to contemporary speaking situations: informative, persuasive, and special occasion. Practice in the preparation and delivery of impromptu, extemporaneous, and manuscript speeches. *(Lec. 3)* Staff

105 Parliamentary Procedures *I, 2*
Those rules governing the conduct of a meeting. The drafting of a constitution and by-laws for local organization. *(Lec. 2)* Roth

111 Principles of Voice and Diction *I and II, 3*
Characteristics of good speech: correct phrasing, intonation and stress patterns, clear and pleasant voice quality, distinct and acceptable pronunciation. Attention given to elimination of minor voice and speech problems. *(Lec. 2, Lab. 2) Prerequisite: departmental examination to be given first day of class.* Staff

112 Voice and Diction for the Theatre Major *I and II, 3*
Principles and esthetics of voice for the stage. Functioning of the vocal mechanism, vocal and articulation techniques, breath control, expressiveness and vocal variety, projection; tension control, posture, spatial relationships, dialects, accents. Practice sessions for reinforcement of theory. *(Lec. 3) Prerequisite: theatre major or permission of instructor.* Caldwell

201 Interpersonal Communication *I and II, 3*
Examination of the human interaction process in informal interpersonal communication situations. Focus on game theory, defensive and supportive climates, non-verbal communication, the interview and informal dialogue. *(Lec. 3)* Devlin and Purdy

210 Elements of Persuasion *I and II, 3*
Analysis of logical, emotional and ethical appeals in persuasive speaking. Study and practice of factors motivating audience belief and acceptance of speaker's ideas. *(Lec. 3)* Staff

215 Argumentation and Debate *I, 3*
Argumentative speech, with special emphasis on debate. Analysis of the proposition, construction of a case, use of evidence and reasoning, rebuttal and the technique of brief-drawing. Analysis of important economic and political questions. *(Lec. 3)* Roth

216 Intercollegiate Debating *I and II, 1*
Intercollegiate tournament debating. Open to those students who are actively engaged in the intercollegiate debate and forensics program. May be repeated for a maximum of 4 credits. *Prerequisite: permission of the director of forensics.* Roth

220 Group Discussion *I and II, 3*
Study of and practice in small group communication. Emphasis on cohesiveness, role-playing leadership, group pressures, and patterns of interaction in a variety of problem-solving small group situations. *(Lec. 3)* Staff

231 Oral Interpretation of Literature *I and II, 3*
Recognition and appreciation of content and communication of thought and emotion through oral reading. Practice in the analysis and interpretation of poetry, prose and drama. *(Lec. 3)* Caldwell and Schmeider

260 Speech Development and Correction *I and 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)* FitzSimons

261 Survey of Hearing and Deafness *I and II, 3*
Introduction to the science of audiology. Study of 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

301 Systems of Communication *II, 3*
Investigation of communication networks in non-symbolic and symbolic systems, focusing on general systems theory, cybernetics, man's physiological system, the computer, and animal and human code systems. *(Lec. 3)* Brownell

310 Contemporary Oral Communication *I and II, 3*
Analysis of contemporary rhetorical theories as they relate to speaking in the fields of business, civil rights, education, government, labor, law and religion. Each semester the course will focus on a critical contemporary issue. *(Lec. 3)* Anderson, Devlin and Doody

315 Environmental Dimensions of Communication *I, 3*
Investigation of the physical properties of the environment and how man's perception and design of these properties affect his communication in personal, social and public situations. Analysis and experimentation with the ways the environment can be used to facilitate communication. *(Lec. 3)* Anderson and Brownell

320 Oral Communication for Management *II, 3*
Examination of business and organizational communication. Emphasis on channels of communication, communication barriers, leadership and the development of communication skills for management personnel. *(Lec. 3) Prerequisite: SPE 101, OMR 301, or permission of instructor.* Erhart

331 Contemporary Approaches to Prose Fiction *I and II, 3*
Oral interpretation of prose fiction with emphasis on the short story and the novel. Contemporary approaches to the oral study of literature such as dramatistic and rhetorical analyses and an introduction to chamber theater. *(Lec. 3) Prerequisite: SPE 231 or permission of department.* Caldwell and Schmeider

332 Oral Interpretation of Poetry *I and II, 3*
Practice in the oral interpretation of poetry through oral performance and written analysis. Emphasis on British and American poets. *(Lec. 3) Prerequisite: SPE 231 or permission of department.* Caldwell

333 Oral Interpretation of Black Literature *II, 3*
Study and oral presentation of literature by black American authors. Class performances, discussion, reports and analysis of the literature. *(Lec. 3) Prerequisite: SPE 231 or permission of instructor.* Caldwell and Schmeider

372 Auditory and Speech Mechanisms *II, 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) Prerequisite: 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) Prerequisite: junior standing.* Beaupre and Staff

374 Communication Processes *II, 3*
Psychocommunication processes basic to speech; theories of language learning; psychology of hearing and deafness; interrelationships between speech and personality. *(Lec. 3) Prerequisite: junior standing.* Beaupre

375 Language Development *I, 3*
Developmental 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) Prerequisite: junior standing.* FitzSimons

400 Rhetoric *I, 3*
Inquiry into the standards for the evaluation and improvement of instrumental discourse. Detailed considerations of invention, disposition and style in oral and written communication. *(Lec. 3)* Bailey

410 Semantics *II, 3*
Role of language and other symbol systems in thought and communication behavior. Informative, valuative,

incitive, and systematic uses of signs; the linguistic bases of productive and pathological communicative behavior. *(Lec. 3)* Bailey

433 Chamber Theatre *I, 3*
Oral interpretation of prose fiction through group performance. Practice in the adapting and directing of narrative fiction for chamber theatre, a technique for dramatizing point of view. *(Lec. 3) Prerequisite: SPE 231, 311.* Caldwell

491, 492 Special Problems *I and II, 1-3 each*
Selected areas of study pertinent to oral communication. Instruction may be offered in class, seminar, or tutorial environments according to specific needs and purposes. Staff

504 Speech and Hearing Research *I, 3*

551 Measurement of Hearing *I, 2-3*

552 Advanced Measurement of Hearing *II, 2-3*

553 Pedoaudiology *I, 2-3*

554 Auditory Training and Speechreading *II, 2-3*

555 Electronically Assisted Hearing *I, 2-3*

556 Automatic Audiometry *II, 2-3*

561 Disorders of Articulation *I, 2-3*

562 Disorders of Voice *I, 2-3*

563 Disorders of Rate and Rhythm *II, 2-3*

564 Disorders of Symbolization *II, 2-3*

565 Diagnostic Procedures: Voice and Articulation *I, 2-3*

566 Diagnostic Procedures: Rhythm and Symbolization *II, 2-3*

567, 568 Clinical Practicum in Speech and Hearing *I and II, 1-3 each*

571 Audiometric Screening and Surveying Techniques *I, 3*

572 Medical Audiology *II, 3*

573 Contemporary Problems in Audiology *I, 3*

574 Environmental Audiology *II, 3*

575 Speech and Language for Deaf or Hard of Hearing Child *I, 3*

576 Speech and Language for Deaf or Hard of Hearing Adult *II, 3*

581 Cerebral Palsy *I, 3*

582 Stuttering and Cluttering *II, 3*

583 Cleft Palate and Other Orafacial Deformities *I, 3*

584 Delayed Speech and Language *II, 3*

585 Aphasia and Allied Language Disorders *I, 3*

586 Alaryngeal Speech *II, 3*

STATISTICS

COORDINATOR: Associate Professor Carney

Experimental Statistics
220 Statisics in Modern Society
411 Statistical Methods in Research I
412 Statistical Methods in Research II
500 Nonparametric Statistical Methods
511 Linear Statistical Models
520 Fundamentals of Sampling and Applications
532 Experimental Design
541 Multivariate Statistical Methods
591, 592 Problems in Experimental Statistics

Industrial Engineering
411 Engineering Statistics I
412 Engineering Statistics II
513 Statistical Quality Control
533 Advanced Statistical Methods for Research and Industry

Management Science
201, 202 Business Statistics
375 Bayesian Statistics in Business
501, 502 Advanced Business Statistics

Mathematics
451 Introduction to Probability and Statistics
452 Mathematical Statistics
456 Probability
550 Advanced Probability
551 Advanced Mathematical Statistics I
552 Advanced Mathematical Statistics II

Psychology
300 Quantitative Methods in Psychology I
410 Quantitative Methods in Psychology II
510 Intermediate Quantitative Methods in Psychology

Resource Economics
576 Econometrics I
577 Econometrics II

TEXTILES AND CLOTHING (TXC)

CHAIRMAN: Professor V. V. Carpenter

103 Consumer Problems in Textiles and Clothing *I and II, 3*
Consumer purchase, use, and care of textile products

as related to aspects of sociology, psychology, economics, and physiology. Various physical tests of fabrics. *(Lec. 2, Rec. 1)* Staff

205 Introductory Clothing *I and II, 3*
Principles of clothing construction based upon interrelationship of fabric, pattern, and form. Aesthetic, economic and managerial aspects of selection. Application of quality standards to construction and ready-to-wear. *(Lec. 1, Lab. 4)* Staff

206 Home Furnishings *I and II, 3*
Discussions and problems to develop discrimination and creative ability in selection of adequate and well-designed home furnishings. *(Lec. 3)* Fry

224 Clothing and Human Behavior *I and II, 3*
Consideration of the social and psychological aspects of dress related to the individual, cultural, and social groups, consumer behavior and patterns of change and stability in dress. *(Lec. 3)* Weeden

238 Textile Design *I and II, 3*
Nature, origin, and development of handicraft methods of applying design to textiles, stressing modern applications and utilization of craft techniques. Laboratory experimentation with original creations in various media. *(Lec. 1, Lab. 4)* Gilbert

303 General Textiles *I and II, 3*
Current textiles and textile products. Emphasis on fabrication which includes fibers, yarns, fabrics and finishes. Field trips. *(Lec. 2, Lab. 2) Prerequisite: TXC 103 or permission of instructor.* Thomas

305 Intermediate Clothing *I and II, 3*
Flat pattern designing with emphasis upon relationship of flat pattern principles to fit. Application of principles in modifying and executing a design. *(Lec. 1, Lab. 4) Prerequisite: TXC 205 or placement test satisfactorily passed.* Staff

306 Home Furnishings *II, 3*
Emphasis on laboratory experimentation with furnishings for the home. *(Lab. 6) Prerequisite: TXC 206.* Fry

322 Fashion Merchandising *II, 3*
Effect of fashion trends and influences on consumer buying patterns and retailing of fashion merchandising. Responsibilities of retail personnel in purchasing and merchandising of fashion products. *(Lec. 2, Lab. 2)* Gilbert

327 Apparel Design *II, 3*
Principles of design as applied to contemporary costume with special emphasis on creative presentation. Laboratory work concentrated on original "croquis" and illustrative techniques. *(Lec. 1, Lab. 4) Prerequisite: TXC 205 or permission of instructor.* Gilbert

340 Historic Costume *I, 3*
Sociological, economic, religious, and political facets affecting the history of costume and resulting fashion changes; national and folk costumes. Use of department's historic costume collection. *(Lec. 3)* Gilbert and Avery

361, 362 Special Problems in Textiles and Clothing *I and II, 1-4 each*
Open to qualified juniors and seniors who wish to do advanced work including field work. Total credits not to exceed 6. *Prerequisite: permission of department.* Staff

390 Senior Seminar *I, 1*
Current professional trends, consideration of experiences in employment and opportunities for graduate study in textiles and clothing. *S/U credit.* Carpenter

403 Advanced Textiles *I, 3*
Analysis of fabrics; methods and techniques of testing fabrics; evaluation of fabric data in relation to end-use performance and to existing quality standards. *(Lec. 2, Lab. 2) Prerequisite: TXC 303.* Thomas and Helms

405 Advanced Clothing *II, 3*
Application of design to dress expressed through draping techniques. Designs draped in fabrics on half- and full-size dress forms. *(Lec. 1, Lab. 4) Prerequisite: TXC 305 or permission of instructor.* Weeden

406 Housing Planning *I, 3*
Fundamental principles of house planning concerning orientation, space relationships, function, flexibility, aesthetic and economic factors. *(Lec. 2, Lab. 2) In alternate years, next offered 1973-74.* Fry

433 Textiles and Clothing Industry *II, 3*
Development, production and distribution of textiles and clothing. Economic aspects of the textile and clothing industry. *(Lec. 3) Prerequisite: ECN 102 or 123 and TXC 103 or permission of instructor.* Harabin

440 Historic Textiles *I, 3*
Chronological study of the development of textiles, emphasizing socio-economic, religious, and political influences. Contribution of designers, inventors, trade groups, industrialists, and primitive cultures. *(Lec. 3) Prerequisite: TXC 103 or permission of department.* Gilbert and Weeden

502 Seminar in Textiles and Clothing *I and II, 3*

524 (424) Seminar in Textiles and Clothing *II, 3*

533 Textile and Clothing Economics *I and II, 3*

540 Special Problems in Textiles and Clothing *I and II, 3*

550 Seminar and Practicum *I and II, 3*

560 Special Problems in Textiles and Clothing *I and II, 3*

570 Seminar in Textiles and Clothing Research *I and II, 3*

580 Research Methods in Textiles and Clothing *I, 3*

THEATRE (THE)

CHAIRMAN: Associate Professor Ranelli

100 Introduction to Theatre *I and II, 3*
Designed to stimulate a taste for theatre, improve standards of critical judgment, consider theatre's relation to allied arts and provide an understanding of the part it plays in the development of civilization. *(Lec. 2, Rec. 1) Not open to theatre majors.* Staff

101 Introduction to Theatre *I, 3*
Basic elements of theatre and dramatic production. *(Studio 6) Prerequisite: open to theatre majors only.* Staff

The following courses in Theatre Practice offer production and performance training in various areas of dramatic arts. They may be elected concurrently with related theatre courses, or independently. See course descriptions for maximum number of credits which may be elected in each.

110 Introduction to Acting *I and II, 2*
An introductory course for non-theatre majors with an interest in acting. *(Studio 4)* Staff

111 Fundamentals of Acting *I, 3*
Introduction to the basics and creation of character and emotions; fundamental rehearsal procedures, stage terminology, and the actor-director relationship. *(Studio 6) Theatre majors only.* Staff

112 Fundamentals of Acting *II, 3*
Development of the technical approach to characterization, the Stanislavski creation of honest emotion, discipline of body movement, and integration of these through improvisation. *(Studio 6) Prerequisite: THE 101.* Staff

151 Makeup *I, 2*
Principles and techniques of stage makeup. Practical experience in the studio and crew work for studio and major productions. *(Studio 4) Prerequisite: permission of instructor.* Spanabel

161 An Introduction to Stagecraft *I and II, 3*
Scenic design, stage carpentry, painting and lighting. *(Lec. 2, Lab. 2)* Steinberg

200 Technical Theatre Practices *I and II, 1*
Experience in actual production preparation and performance through specific project assignments in connection with current productions. Areas include: costumes, scenery, properties, lighting, and sound. *(Studio 3) Prerequisite: written permission of appropriate instructor in the area involved. (Max. 4 credits.)* Staff

211 Intermediate Acting I *I, 3*
Improvisation/scene study. Roles chosen to parallel actor's age, type, values. Emphasis on bridging the gap between exercise/improvisation and a preconceived script. *(Studio 6) Prerequisite: THE 112 and permission of instructor.* Staff

212 Intermediate Acting II *II, 3*
Continued scene study chosen from the modern realistic period. Problems of characterization emphasized. *(Studio 6) Prerequisite: THE 111, 112, 211 and permission of instructor.* Staff

215 Movement and Mime *I and II, 2*
Exercises to free the body and develop it for meaningful stage movement; discipline of the body to communicate feeling and character without words. *(Studio 4) Prerequisite: permission of instructor.* Staff

221 Stage Management/Directing Workshop *I and II, 2*
Introduction to stage management and directing. Students will work closely with staff directors and stage managers. *(Studio 4) Prerequisite: permission of staff. (Max. 4 credits.) Not offered in 1973-74.* Staff

250 Costuming *I and II, 2*
Principles of costume construction. Practical experience in building costumes for studio and major productions. *(Studio 4) Prerequisite: permission of instructor.* Spanabel

251 Advanced Stage Makeup *II, 1*
Advanced techniques in theatrical makeup with emphasis on character delineations and special effects. *(Lab. 2) Prerequisite: THE 151. Not offered in 1973-74.* Spanabel

265 Theatre Graphics *II, 2*
Methods and procedures of reading and execution of the specialized descriptive and informational drawings required for theatrical production. *(Lab. 4) Prerequisite: THE 161. Not offered in 1973-74.* Staff

281 Principles of Theatre *II, 3*
Approaches to theatre concepts are studied in relation to their influence on theatre practice. Emphasizes the dramatic composition, acting, directing, design. *(Lec. 3) Prerequisite: THE 100 or 101.* Staff

305 (or EDC 305) Fundamentals of Theatre Practices *II, 3*
Introduces the potential secondary school teacher of dramatics and those expecting to work in community theatre to the problems of play selection; stagecraft, scene design, and lighting; theatre management; and other problems of production in the non-professional theatre. *(Lec. 3) Prerequisite: permission of department. May not be used for credit toward a major in theatre. Not offered in 1973-74.* Staff

311 Advanced Acting *I, 3*
Scene study. Problems of style, ensemble choral work, Shakespeare, and Restoration. Style considered as

symbolic action. *(Studio 6) Prerequisite: THE 212 and permission of instructor.* Staff

312 Advanced Acting *II, 3*
Continued scene study in style. Avant-garde ensemble techniques, style of the non-English theatre. Style of the non-verbal theatre. *(Studio 6) Prerequisite: THE 311 and permission of instructor.* Staff

321 Directing *I, 3*
Director's part in the creative processes of theatre techniques, procedures, and solution of problems in directing, from analysis of script to performance *(Lec. 3) Prerequisite: THE 212 or permission of instructor.* Staff

322 Advanced Directing *II, 3*
Continuation of THE 321 with emphasis on particular problems of the director in rehearsal and production situations. *(Lec. 2, Studio 2) Prerequisite: THE 321. Not offered in 1973-74.* Staff

331 Playwriting *I, 3*
Analysis and evaluation of written material supplemented by play readings and workshop tryouts of student plays. *(Lec. 3) Prerequisite: permission of instructor.* Smoker

341 Theatre Management *I and II, 2*
Analysis of the economics of theatre, promotion techniques, union regulations, laws of literary property, philanthropy, and producing aspects of theatre. *(Lec. 1, Lab. 2) Prerequisite: permission of instructor.* Smoker

351 Principles and Theories of Theatrical Costuming I *I, 3*
Analytical study of fashions, modes and manners in Western civilization as required for modern theatrical production, Greek through the Renaissance. *(Lec. 3) Prerequisite: junior standing or permission of instructor.* Spanabel

352 Principles and Theories of Theatrical Costuming II *II, 3*
Continuation of THE 351, the Renaissance to the present. *(Lec. 3) Prerequisite: THE 351 or permission of instructor.* Spanabel

361 Theatre Technology *II, 3*
Theatre architectural forms and their influence on production. Details of mechanical staging systems, the shop as a production unit, modern technological materials and processes. *(Lec. 2, Lab. 2) Prerequisite: THE 161.* Staff

365 Scenic Design I *I, 3*
Theories and techniques of scenic design, emphasizing conceptualization and development of stage setting through project designs for various stage forms, production styles, and periods. *(Lec. 2, Lab. 2) Prerequisite: THE 161 and 265 or equivalent.* Emery

366 Scenic Design II *II, 3*
Application of scenic design theories and techniques to modern staging, emphasizing differing production types and styles, new stage forms, and non-traditional materials. *(Lec. 2, Lab. 2) Prerequisite: THE 365.* Emery

371 Stage Lighting I *I, 3*
Theories and techniques of lighting for the stage with concentration on instrumentation and equipment characteristics and their uses in designed lighting for theatrical productions. *(Lec. 2, Lab. 2) Prerequisite: THE 161 and 265 or equivalent.* Staff

372 Stage Lighting II *II, 3*
Theatrical lighting design practices, creation of special effects, and in-depth study of stage lighting equipment and materials. *(Lec. 2, Lab. 2) Prerequisite: THE 371.* Staff

381 History of Theatre through the Eighteenth Century *I, 3*
Development of the theatre from its origins through the neo-classical movement including its people, technical elements, theories and styles of productions. *(Lec. 3) Prerequisite: junior or senior standing.* Will

382 History of Theatre since the Eighteenth Century *II, 3*
Development of the modern theatre from the revolt against neo-classicism to post-World War II. Particular emphasis on the new European stagecraft and the contributions of Duke George, Antoine, Appia, Craig and Stanislavski. *(Lec. 3) Prerequisite: junior or senior standing.* Will

400 Individual Problems in Theatre Studies *I and II, 1-3*
Advanced individual theatre work of an approved project under supervision of a staff member. *Prerequisite: permission of staff. (Max. 3 credits.) Not for graduate degree program credit.* Staff

401 Special Group Studies *I and II, 1-3*
Advanced group theatre work in production projects under approval and supervision of a staff member. *Prerequisite: permission of staff. (Max. 3 credits.) Not for graduate degree program credit.* Staff

410 Advanced Acting *I and II, 1-3*
Special projects for the advanced student capable of stage involvement, character development, stage discipline. Assigned projects to meet specific acting problems; supervision by staff and/or advanced student directors. *(Studio 2-6) Prerequisite: THE 111, 112, 211, 212, 311, 312 or equivalent; senior standing and permission of department.* Staff

420 Advanced Directing Practice *I and II, 1-3*
Special projects for the advanced directing student. Student directors will assume complete production responsibilities for all aspects of their projects, including a critical analysis upon completion. *(Studio*

2-6) Prerequisite: THE 321, 322 or equivalent, junior standing, and permission of department. Staff

440 Advanced Stage Management *I and II, 1-3*
Individual projects of stage management in at least one major production. *(Studio 2-6) Prerequisite: THE 221 and permission of department.* Staff

450 Advanced Costuming *I and II, 1-3*
Individual projects in costume design for studio or major productions. Styles and theory related to projects; costume sketches and construction. *(Studio 2-6) Prerequisite: THE 250 and permission of instructor.* Spanabel

451 Stage Costume Technology *I, 2*
Construction methods and techniques appropriate to stage costuming with emphasis on major theatrical periods and productions. *(Lec. 1, Lab. 2) Prerequisite: THE 351 or 352 or permission of instructor. Not for graduate degree program credit.* Spanabel

460 Advanced Scene Design *I and II, 1-3*
Individual projects in designing scenery for studio and major productions. *(Studio 2-6) Prerequisite: THE 161, 365, and permission of instructor.* Emery

470 Advanced Stage Lighting *I and II, 1-3*
Individual projects in lighting design and control for studio and major productions. *(Studio 2-6) Prerequisite: THE 371, 372 and permission of department.* Staff

481 American Theatre History *I, 3*
Origins and development of American theatre from the wilderness to Broadway of 1940's, including the evolution of the musical play. Analysis of special contributions made by the grassroots movement, the university theatres, the Federal Theatre Project. *(Lec. 3) Not for graduate degree program credit.* Will

482 Contemporary Theatre *I, 3*
Theatre practices since World War II. Analysis of present conditions in the areas of playwriting, direction, design, architecture, and business. *(Lec. 3)* Wheelock

ZOOLOGY (ZOO)

CHAIRMAN: Professor Chipman

111 General Zoology *I and II, 4*
Physiology, development, genetics, ecology and study of types of animals, with emphasis on evolution. Introduction to further studies in zoology for both potential professional and non-professional students. *(Lec. 3, Lab. 2) Not open to students who have passed BIO 102.* Surver

121 Human Anatomy *I, 4*
Elementary anatomy of the organ systems, studied with the aid of charts, models and dissection of the cat. *(Lec. 2, Lab. 4) Limited to students in Physical Education, Dental Hygiene, Nursing, and Ventilation Therapy.* Bibb

242 (142) Introductory Human Physiology *I and II, 3*
Functions of the organ systems of the human body and their coordination in the whole human organism. Attention is given to the needs of students preparing for health-related professions. *(Lec. 3) Prerequisite: BIO 102 or ZOO 111 or 121.* Harrison

244 (142) Introductory Human Physiology Laboratory *I and II, 1*
Mechanisms of physiological processes are illustrated by experiments on vertebrate animals. *(Lab. 3) Prerequisite: prior or concurrent enrollment in ZOO 242. Not open to students who have passed ZOO 442.* Harrison and Staff

262 (or BOT 262) Introductory Ecology *I, 3*
Structure and function of ecosystems; limiting factors; population dynamics; population interactions and community relationships. Selected habitats and general ecological effects of man. *(Lec. 3) Prerequisite: two semesters of biology, botany or zoology, or any combination thereof.* Shoop and Halvorson

314 Chordate Anatomy and Morphogenesis *II, 5*
Functional anatomy of selected chordates, including a consideration of embryogenesis, the anatomy and development of the body plan, integument, skeleton muscles and other organ systems in various vertebrate classes. *(Lec. 3, Lab. 6) Prerequisite: ZOO 111.* Goertemiller and Bibb

315 Cells and Tissues *I, 4*
Structure and function of normal cells and tissues. Introduction to modern techniques for preparing cytological, histological, embryological and parasitological material for microscopical study. Introduction to histochemistry, radioautography and electron microscopy. *(Lec. 2, Lab. 4) Prerequisite: ZOO 111 or BIO 102. In alternate years, next offered 1973-74.* Goertemiller

331 Parasitology *I, 3*
Structure, life cycles, ecology and economic relationships of the parasitic protozoa, helminths and arthropods. Origin and biological significance of parasitism and host-parasite relationships are stressed. Laboratory encompasses experimental work on life cycles of selected species, and on collection and identification of local parasitic forms including those from the marine fauna. *(Lec. 2, Lab. 2) Prerequisite: ZOO 111 or BIO 102.* Hyland

343 (143) Physiology of Exercise *I, 3*
Applied human physiology, with applications to work, health, physical education and athletic sports. Particular attention to adjustments of the circulatory and respiratory systems during physical activity. *(Lec. 2, Lab. 3) Prerequisite: ZOO 242 or 345.* Harrison

345 Basic Animal Physiology *I, 3*
Fundamental physiological processes of animals with emphasis on homeostatic mechanisms. Nature of os-

mosis, membranes, water and electrolyte balance, irritability and the functioning of selected organ systems. *(Lec. 2, Lab. 3) Prerequisite: ZOO 111 or BIO 102.* Hill

354 Invertebrate Zoology *II, 4*
Representative types of invertebrate animals, laboratory dissections, observations and experiments. Occasional field trips. Lectures emphasizing progressive specialization of structure and function. *(Lec. 2, Lab. 6) Prerequisite: ZOO 111 or BIO 102.* Zinn

381 General Entomology *I, 3*
Anatomy, physiology, life cycles, classification of orders and the more important families and species of insects. Field studies on biology, ecology, collecting and survey methods. *(Lec. 1, Lab. 4) Prerequisite: ZOO 111 or BIO 102.* Mathewson

391, 392 Assigned Work *I and II, 1-3 each*
Special arrangements for undergraduates for advanced work in anatomy, endocrinology, physiology, histology, embryology, entomology, taxonomy, ecology, marine biology and certain related subjects. Individual or group work by arrangement with a member of the staff and with permission of the chairman. *(Lec. 1-3 or Lab. 2-6)* Staff

395 Seminar in Zoology *I and II, 1*
Introduction to sources of zoological literature. Presentation of reports of scientific papers by students, with discussion by the class. *(Lec. 1) Required of seniors majoring in zoology. Attendance is required at weekly Department of Zoology colloquiums.* Staff

421 Principles of Taxonomy *I, 3*
Principles and methods of identification, including study of rules of zoological nomenclature. Practice on selected animal groups. Visits to representative museums in New England. *(Lec. 2, Lab. 3) Prerequisite: ZOO 111 or BIO 102. In alternate years, next offered 1974-75.* Zinn

441 General (Cellular) Physiology *I, 3*
Fundamental processes occurring in living matter, especially functions at the cellular level with emphasis on biochemical and biophysical bases of functions common to all forms of life. Nature of protoplasm, enzymes, respiration, biological oxidations, nutrition, permeability and water balance, irritability, muscle, nervous and humoral mediation. *(Lec. 2, Lab. 3) Prerequisite: BOT 111, ZOO 111, PHY 111, CHM 124, or equivalent.* Hammen

442 Mammalian Physiology *II, 3*
Intensive study of the physiological mechanisms that regulate the animal body and its organ systems. Emphasis on knowledge obtained from experimental mammalian and human physiology. Laboratory experiments on vertebrate animals. *(Lec. 2, Lab. 3) Prerequisite: ZOO 345.* Hill

455 (or BOT 455) Marine Ecology *I, 3*
Investigation of the structure and dynamics of various marine ecosystems. Includes mineral cycling, energy flow, community and population organization and behavioral ecology in selected marine environments. *(Lec. 3) Prerequisite: ZOO 262 or BOT 262, or permission of instructors. In alternate years, next offered 1974-75.* Cobb and Harlin

457 (or BOT 457) Marine Ecology Laboratory *I, 1*
Field and laboratory work on community relationships of dominant organisms in Rhode Island marine environments. *(Lab. 3) Prerequisite: concurrent enrollment in ZOO 455 or BOT 455, and permission of instructors. Limited to 15 students. In alternate years, next offered 1974-75.* Cobb and Harlin

463 Animal Ecology *II, 3*
Roles of animals in the structure and function of ecosystems. The adaptations of animals to their environments and the effects of limiting factors. Analysis of animal populations and communities. Use of statistical techniques. Readings in primary source materials, laboratory and field studies. *(Lec. 2, Lab. 3) Prerequisite: BOT 262 or ZOO 262 or permission of instructor.* Shoop

465 Limnology *I, 3*
Physical and chemical properties of natural waters, such as thermal stratification and dissolved gases, in relation to biotic communities in the aquatic environment. Survey of fauna and flora of standing and running water. Introduction to concept of productivity. *(Lec. 3) Prerequisite: ZOO 111.* Cobb

466 Vertebrate Biology *II, 3*
Life histories, adaptations, ecology, classifications and distribution of vertebrate animals. Laboratory and extensive field work on local vertebrates. *(Lec. 2, Lab. 3) Prerequisite: ZOO 216 or equivalent.* Heppner

467 Animal Behavior *II, 3*
The ethology and comparative psychology of both invertebrate and vertebrate animals as individuals and groups. The integration, causation, development, evolution, and adaptive values of behavior patterns, social behavior. *(Lec. 2, Lab. 3) Prerequisite: ZOO 111 and junior standing.* Cobb

468 Mammalogy *II, 3*
Characteristics and adaptive significance of mammals encompassing their evolution, classification, distribution, life-histories, population dynamics and behavior. Methods and techniques of the identification, collection and preparation of local mammals for study. Field work will be emphasized. *(Lec. 2, Lab. 3) Prerequisite: ZOO 216 and 466 or equivalent. In alternate years, next offered 1974-75.* Staff

471 Evolution *I, 3*
Consideration of the process of organic evolution, the genetic mechanisms, including the interaction of genotype and environment, the history of evolutionary thought, the paleontological record and the biochemical origin of life. *(Lec. 3) Prerequisite: ASC 352 or BOT 352 or permission of instructor.* Constantino

473 History of Biology *I, 3*
Historical development and interdependence of basic concepts of biology on allied fields in the natural sciences from pre-biblical times to the present. *(Lec. 3) Prerequisite: junior standing or permission of instructor. In alternate years, next offered 1973-74.* Zinn

477 Human Genetics *I, 3*
Degree and mode of inheritance of physical and mental variations of man which have been shown to have at least some genetic basis. A term paper is required. *(Lec. 3) Prerequisite: BOT 352, or ZOO 472, or equivalent.* Surver

482 Systematic Entomology *II, 3*
Detailed study of insect classification with emphasis on identification of various groups and subgroups. Collecting techniques, curatorial processes and problems of an entomological collection. *(Lec. 1, Lab. 4) Prerequisite: ZOO 354 or 381 or graduate standing. In alternate years, next offered 1974-75.* Hyland

484 (or ELE 484) Modeling of Physiological Systems *II, 3*
Physiological study of selected systems and the development of dynamic models to describe their behavior. Lectures and laboratory projects are concerned primarily with the nervous system. Data collected from initial laboratory experiments with animals are used for later experiments with analog computer modeling. *(Lec. 2, Lab. 3) Prerequisite: MTH 141, ZOO 345. In alternate years, next offered 1974-75.* Staff

512 Fine Structure of the Animal Cell *II, 4*

531 Advanced Parasitology Seminar *I, 2*

541, 542 Comparative Physiology *I and II, 3 each*

543 Biology of Reproduction in Animals *I, 3*

545 Endocrinology *I, 3*

548 Neurophysiology *II, 4*

552 Pathology of Endocrine Functions *II, 3*

554 Seminar in Morphogenetic Theory *II, 2*

562 Seminar in Behavioral Ecology *I, 1*

563 Ichthyology *I, 3*

564 Oceanic Ichthyology *II, 3*

566 Herpetology *II, 3*

573 Developmental Genetics *I, 3*

576 Ecological Genetics *II, 4*

579 (or BOT 579) Advanced Genetics Seminar *I and II, 1*

581 General Acarology *I, 3*

586 Medical and Veterinary Entomology *II, 3*

595, 596 Graduate Seminar in Zoology *I and II, 1 each*

Chafee Social Science Center

Directories

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JOHN B. SMITH, M.S., *Professor of Agricultural Chemistry, Emeritus*

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HOMER O. STUART, M.S., *Director of Agricultural and Home Economics Extension, Emeritus*

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MARY CECILIA WHITLOCK, M.A., *Professor of Textiles and Clothing, Emerita*

CARL R. WOODWARD, Ph.D., Litt.D., D.Sc., LL.D., Ed.D., *President, Emeritus*

FACULTY

First date after title indicates appointment to present position; the second date, when the first fails to do so, indicates first appointment in the University.

PAUL IRVING ABELL, *Professor of Chemistry, 1964, 1951*
B.S., 1948, University of New Hampshire; Ph.D., 1951, University of Wisconsin.

WARD ABUSAMRA, *Associate Professor of Music, 1965, 1952*
B.S., 1950; M.A., 1951, Columbia University.

ELIE ABUSHANAB, *Associate Professor of Medicinal Chemistry, 1973, 1970*
B.S., 1960, American University of Beirut; M.S., 1962; Ph.D., 1965, University of Wisconsin.

ROY AGELOFF, *Assistant Professor of Management Science, 1972*
B.S., 1965, University of New York at Buffalo; M.B.A., 1967, University of Connecticut.

LUKE S. ALBERT, *Professor of Botany, 1970, 1960*
B.S., 1950, Lebanon Valley College; M.S., 1952; Ph.D., 1958, Rutgers—The State University.

LEWIS M. ALEXANDER, *Professor of Geography and Director, Law of the Sea Institute, 1960*
A.B., 1942, Middlebury College; M.A., 1948; Ph.D., 1949, Clark University.

ANTHONY J. ALLEN, *Assistant Professor of Education, 1969*
B.S., 1960, Loyola University; M.Ed., 1967; Ph.D., 1970, Boston College.

WILLIAM R. ALLEN, *Assistant Professor of Organizational Management and Industrial Relations, 1973*
B.S., 1960, U.S. Coast Guard Academy; M.B.A., 1971, University of Florida.

AARON JOHN ALTON, *Professor of Marketing Management, 1961*
A.B., 1942, Miami University (Ohio); M.B.A., 1947, Harvard Business School; Ph.D., 1956, Ohio State University.

DAVID L. ANDERSON, *Assistant Professor of Journalism, 1969*
B.J., 1961, University of Missouri; M.A., 1969, University of Massachusetts.

JUDITH L. ANDERSON, *Assistant Professor of Speech, 1970*
B.A., 1962; M.A., 1963, University of Kansas; Ph.D., 1970, Indiana University.

E. JAMES ARCHER, *Professor of Psychology, 1971, 1969*
B.S., 1949; M.S., 1950; Ph.D., 1952, Northwestern University.

CHARLES P. ARMSTRONG, *Assistant Professor of Management Science, 1971*
B.S., 1961; M.B.A., 1965, University of Illinois; Ph.D., 1973, University of Arizona.

SONA ARONIAN, *Assistant Professor of Russian, 1970*
A.B., 1960, Boston University; Ph.D., 1971, Yale University.

JOHN WRIGHT ATWOOD, *Associate Extension Professor of Animal Science, 1960*
B.S., 1941, University of Connecticut; M.S., 1953, University of Rhode Island.

ROBERT C. AUKERMAN, *Professor of Education, 1954* (Leave Sem. I, II)
A.B., 1934; A.M., 1935, Wayne State University; Ph.D., 1945, University of Michigan.

STEPHEN K. AULT, *Assistant Professor of English, 1972*
B.A., 1967, Northwestern University; M.A., 1969, Harvard University.

CAROL E. AVERY, *Instructor in Textiles and Clothing, 1970* (Leave Sem. I, II)
B.S., 1951; M.S., 1967, University of Rhode Island.

ALFRED CLARENCE BACHELDER, *Associate Professor of Mechanical Drawing and Shopwork and Director of Engineering Instrument Shop, 1962, 1947*
B.S., 1943, Rhode Island School of Design; M.S., 1955, University of Rhode Island.

MARY-JANE BACON, *Associate Professor of Food and Nutritional Science, 1955, 1947*
B.S., 1943, University of New Hampshire; M.S., 1947, Teachers College, Columbia University.

NADINE BAER, *Assistant Professor in the Library, 1971, 1947*
B.S., 1947, Simmons College.

RICHARD E. BAILEY, *Associate Professor of Speech, 1972, 1967* (Leave Sem. I)
B.A., 1951, Otterbein College; B.D., 1954, United Theological Seminary; M.A., 1964; Ph.D., 1968, Ohio State University.

BERTON E. BALLARD, *Professor of Pharmacy, 1972*
A.B., 1951, University of California, Berkeley; B.S., 1955, University of California, San Francisco; Pharm.D., 1956; Ph.D., 1961, University of California.

BRIAN K. BARBER, *Assistant Professor of Transportation Planning, 1973*
B.S., 1960, Florida State University; M.U.P., 1962, University of Washington.

MARTHA EMILY BARDEN, R.N., *Assistant Professor of Public Health Nursing, 1963, 1961*
Diploma, 1944, Rhode Island Hospital School of Nursing; B.S., 1956, Boston University; M.S., 1961, Yale University.

WALTER L. BARKER, *Associate Professor of English, 1973, 1966* (Leave Sem. II)
B.A., 1960; M.A., 1962, University of Rhode Island; Ph.D., 1966, University of Connecticut.

HAROLD BARNETT, *Instructor in Economics, 1970*
B.A., 1965, Miami University (Ohio).

JUDITH B. BARNETT, *Assistant Librarian (Instructor) in the Library, 1971*
A.B., 1959, Barnard College; M.L.S., 1962, Drexel University.

STANLEY M. BARNETT, *Assistant Professor of Chemical Engineering, 1969*
B.A., 1957, Columbia College; B.S., 1958, Columbia University; M.S., 1959, Lehigh University; Ph.D., 1963, University of Pennsylvania.

ROBERT ALFRED BARRON, *Assistant Professor of Mathematics, 1956*
A.B., 1951, Princeton University; M.A., 1955, Fordham University.

CLAIRE BARTHOLOMEW, R.N., *Assistant Professor of Mental Health and Psychiatric Nursing, 1972*
Diploma, Newport Hospital School of Nursing; B.S., 1946, University of Chicago; M.P.H., 1952, University of Minnesota.

LEONARD J. BASS, *Assistant Professor of Computer Science, 1970*
B.A., 1964; M.A., 1966, University of California, Riverside; Ph.D., 1970, Purdue University.

MICHAEL S. BASSIS, *Instructor in Sociology, 1971*
A.B., 1967, Brown University; M.A., 1968, University of Chicago.

M. DEAN BATROUKHA, *Associate Professor of Journalism, 1966, 1959*
B.A., 1950; M.A., 1954, Cairo University; Ph.D., 1961, Syracuse University.

WALTER J. BEAUPRE, *Professor of Speech, 1968*
A.B., 1947, Bates College; M.A., 1951, Lehigh University; Ph.D., 1962, Columbia University.

RAYMOND A. BEAUREGARD, *Assistant Professor of Mathematics, 1968*
A.B., 1964, Providence College; M.S., 1966; Ph.D., 1968, University of New Hampshire.

CARL HARRY BECKMAN, *Professor of Plant Pathology-Entomology, 1969, 1963*
B.S., 1947, University of Rhode Island; Ph.D., 1953, University of Wisconsin.

SUE FISHER BECKMAN, *Assistant Professor of English, 1972, 1966*
B.S., 1964, Kutztown State College; M.A., 1966, Miami University (Ohio).

ROBERT G. BELL, *Assistant Professor of Biochemistry, 1971*
A.B., 1959, Bradley University; Ph.D., 1964, St. Louis University, School of Medicine.

MICHAEL L. BENDER, *Assistant Professor of Oceanography, 1972*
B.S., 1965, Carnegie Institute of Technology; Ph.D., 1970, Columbia University.

EDWARD G. BENSON, *Assistant Professor of French, 1971, 1970*
A.B., 1963, Princeton University; M.A., 1968; Ph.D., 1971, Brown University.

JAMES G. BERGAN, *Assistant Professor of Food and Nutritional Science and Food and Resource Chemistry, 1972, 1971*
B.S., 1966; Ph.D., 1970, University of Illinois.

DANIEL P. BERGEN, *Associate Professor of Library Science, 1970*
A.B., 1957, University of Notre Dame; A.M., 1961, University of Chicago; M.A., 1962, University of Notre Dame; M.A., 1968; Ph.D., 1970, University of Minnesota.

STANLEY I. BERGER, *Professor of Psychology, 1965, 1963*
B.A., 1950, Brooklyn College; M.A., 1955; Ph.D., 1957, University of Kansas.

MARY R. BERK, *Assistant Professor of Psychology, 1971*
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ALLAN BERMAN, *Assistant Professor of Psychology, 1970, 1968*
B.A., 1962, University of Massachusetts; M.Ed., 1963, Boston University; Ph.D., 1968, Louisiana State University.

HAROLD D. BIBB, *Assistant Professor of Zoology, 1972*
B.A., 1962, Knox College; M.S., 1964; Ph.D., 1969, University of Iowa.

HENRY B. BILLER, *Associate Professor of Psychology, 1971, 1970*
A.B., 1962, Brown University; Ph.D., 1967, Duke University.

JOHN R. BIRK, *Assistant Professor of Electrical Engineering, 1970*
B.E., 1966, The Cooper Union; M.S., 1968, Ph.D., 1971, University of Connecticut.

J. TEMPLE BLACK, *Associate Professor of Industrial Engineering, 1972*
B.S., 1960, Lehigh University; M.S., 1963, West Virginia University; Ph.D., 1969, University of Illinois.

STEPHANIE BLECHARCZYK, *Instructor in Food and Nutritional Science, 1961*
B.S., 1957; M.S., 1961, University of Rhode Island.

LINDA L. BLOOD, *Assistant Professor of Child Development and Family Relations, 1968, 1965*
B.S., 1962, University of Maine; M.S., 1965, Oklahoma State University.

LORRAINE C. BLOOMQUIST, *Assistant Professor of Physical Education for Women, 1971, 1967*
B.S., 1966; M.S., 1968, University of Rhode Island.

MARGARET P. BOGER, R.N., *Assistant Professor of Medical-Surgical Nursing, 1972, 1968* (Leave Sem. I, II)
B.S.N., 1958, St. Louis University; M.S., 1966, Boston University; CAGS, 1969, University of Connecticut.

LEA M. BOHNERT, *Assistant Professor of Library Science, 1970*
B.A., 1942; M.A., 1947, University of Chicago.

HOWARD W. BOND, *Professor of Medicinal Chemistry, 1966* (Leave Sem. I)
B.S., 1936, University of Arkansas; M.S., 1938; Ph.D., 1941, University of Illinois.

ROBERT EDWARD BONNER, Captain, U.S. Army, *Assistant Professor of Military Science, 1972*
B.A.A., 1965, Auburn University; M.A., 1972, University of South Carolina.

G. GEOFFREY BOOTH, *Assistant Professor of Finance, 1971, 1970*
B.B.A., 1964; M.B.A., 1966, Ohio University; Ph.D., 1971, University of Michigan.

LEON FRANCIS BOUVIER, *Associate Professor of Sociology, 1973, 1966*
B.S., 1961, Spring Hill College; M.A., 1963; Ph.D., 1971, Brown University.

SUSAN M. STRICKLAND BOUVIER, *Instructor in Business Education and Office Administration, 1971*
B.S., 1967, Bryant College; M.S., 1970, University of Rhode Island.

JEANETTE E. BOWKER, *Instructor in Textiles, Clothing and Related Arts, 1973*
B.S., 1960, Nebraska State; M.S., 1973, University of Rhode Island.

LARSEN BOWKER, *Assistant Professor of English, Division of University Extension, 1973*
B.A., 1960, Kearney State College; M.A., 1965, University of Wyoming.

BEVERLY HOSBROOK BOWMAN, *Associate Professor of Marketing Management, 1958, 1954*
B.S., 1937, Northeastern State College; M.S., 1939, Oklahoma State College.

DONALD BRADBURY, *Professor of Mechanical Engineering and Applied Mechanics, 1953, 1950*
B.S., 1939, Tufts College; M.S., 1940; S.D., 1950, Harvard University.

CALVIN H. BRAINARD, *Professor of Finance and Insurance, 1961, 1953* (Leave Sem. I)
A.B., 1935, Columbia University; M.B.A., 1948; Ph.D., 1951, New York University.

RICHARD R. BRAND, *Assistant Professor of Geography, 1972, 1970*
B.A., 1964, St. Johns University; M.A., 1965; Ed.D., 1972, Teachers College, Columbia University.

CHARLES H. BRANDON, *Assistant Professor of Accounting, 1973*
B.S., 1967; M.S., 1968, Florida State University; Ph.D., 1972, University of Georgia.

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ANNA G. HAGGARTY, *Research Assistant*
ROBERT W. SUTTON, Jr., M.P.A., *Research Assistant*

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S. RONALD NOCITO, *Assistant Director for Maintenance Operations*
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MURIEL E. WHEATLEY, B.S., *Administrative Secretary*

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LEON INMAN, *Resident Engineer*

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NEIL W. ROSS, M.Ed., *Marine Extension Specialist*
ELISABETH C. KEIFFER, B.A., *Editorial Assistant*
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IRVING A. SPAULDING, Ph.D., *Resource Economics and Rural Sociology*

Appendix

LOAN FUNDS AND SCHOLARSHIPS

These are privately contributed loan and scholarship funds. For federal programs and general student aid information see page 21.

LOAN FUNDS

Norman M. Fain Fund, Providence Wholesale Drug Company Fund, The Rhode Island Foundation Fund, The University of Rhode Island Foundation Fund and the URI Alumni Association Fund are privately contributed loan funds of $5,000 or over, used as "matching funds" for federal loan programs.

Alumni Association Fund, Leroy F. Burroughs Fund, Providence Engineering Society Fund, and the John H. Washburn Memorial Fund are privately contributed loan funds of $5,000 or more administered by the Student Aid Office.

Metropolitan Providence Cooperative Extension Loan Fund (honoring retired agent Ella Simas): $200 available annually to sophomore, junior, or senior who is a metropolitan homemaker or member of a metropolitan homemaker's family.

Patrons Association Loan Fund: Short-term loans for emergency reasons, administered by Dean of Students.

Dean Mason Campbell Memorial Loan Fund: Short-term loans for emergency reasons, administered by Dean, College of Resource Development.

SCHOLARSHIPS

Scholarships preceded by an asterisk(*) have recipients selected by the college concerned and/or the organization providing the funds.

ANY COLLEGE OF THE UNIVERSITY

ALUMNI ASSOCIATION: Income from endowment. (See also Francis H. Horn and Carl R. Woodward Scholarships.)

ALUMNI CENTURY CLUB MEMORIAL: Offered in honor of Rhode Island alumni who sacrificed their lives in two world wars. Recipients selected on the basis of financial need, campus citizenship, scholastic ability and leadership as evidenced by participation in sports and other extracurricular activities.

AMERICAN SCREW COMPANY FOUNDATION: Income from $10,000 endowment awarded to worthy students, with preference to children of former employees of American Screw Company.

ANN & HOPE (Martin Chase Memorial): $1,000 awarded annually, with preference to students with financial need, Ann & Hope employees, children of Ann & Hope employees, residents of Cumberland or Warwick, R.I., or students majoring in retail distribution related fields.

ARTACKY AND ELESE BERBERIAN: $200 awarded annally to a deserving student.

LEROY F. BURROUGHS: Income from $5,000 endowment awarded annually to a deserving student.

CASTELLUCCI AND GALLI, INC.: Income from $5,000 endowment, awarded annually to a deserving student.

CITIZENS BANK: $500 awarded annually to deserving students who are Rhode Island residents, with preference to children of employees of Citizens Bank.

COTTRELL COMPANY, DIVISION OF HARRIS-INTERTYPE CORPORATION: $1,000 available annually, with preference first to children of Cottrell employees, second to residents of Westerly-Pawcatuck area, third to students in College of Engineering.

A. T. CROSS COMPANY: Income from $10,000 endowment awarded to a deserving student.

SENATOR WILLIAM M. DAVIES, JR., MEMORIAL: Offered to residents of Rhode Island in honor of an outstanding and respected member of the General Assembly, who was leader of the state senate when he died on January 1, 1963, $500 available annually for two $250 awards to be made for the freshman and sophomore years.

FRANCES B. DEFRANCE MEMORIAL: For woman student with financial need. Contributed by Chapter B-P.E.O., Kingston, R.I. in memory of its beloved member and one of its founders, Frances B. DeFrance (Mrs. Jesse A.).

DANIEL R. DYE MEMORIAL: $200 annually to a graduate of East Providence, R.I., High School who has financial need, selected by the URI Student Aid Office and Awards Committee.

FEDERAL PRODUCTS FOUNDATION: $5,400 available annually, with preference given to sons and daughters of Federal Products Corporation employees.

GROSSMAN FOUNDATION: $200 awarded annually to a deserving student.

HEDISON CORPORATION: $200 awarded annually to a deserving student.

JAMES H. HIGGINS MEMORIAL: Income from $10,000 endowment, awarded to deserving men or women students. Gift is from the estate of Mrs. James H. (Ellen F.) Higgins.

JAMES H. HIGGINS, JR.: Income from $11,000 endowment, awarded to deserving students.

HIGH SCHOOL MODEL LEGISLATURE: Amount of general fee awarded to an incoming freshman who has given outstanding performance in the Model Legislature. Application must be made for this award.

PERCY HODGSON: Income from $10,000 endowment awarded annually to worthy students, with preference to students from foreign countries.

FRANCIS H. HORN: Income from $10,000 gift of URI Alumni Association and $17,345 in gifts from Friends of Francis H. Horn, with special consideration to applicants from foreign countries who can qualify with respect to academic standing and financial need.

INDUSTRIAL NATIONAL BANK OF RHODE ISLAND: $1,000 available annually, with preference to children of Industrial National Bank employees.

INTERNATIONAL STUDENT: A limited number of partial or full out-of-state tuition awards based on financial need.

A. LIVINGSTON KELLEY MEMORIAL: Income from $5,000 endowment, established by the will of A. Livingston Kelley, awarded to a worthy student who is a resident of Rhode Island.

KENYON PIECE DYEWORKS, INC.: Income from $9,500 endowment, with preference to children of employees having financial need.

HARRY KNOWLES MEMORIAL: Income from $8,000 endowment established by the will of Harry Knowles.

LEVITON FOUNDATION: Two $750 awards available annually to children of employees of American Insulated Wire, Atlas Wire & Cable, Cable Electric Products, Leviton Manufacturing, Rhode Island Insulated Wire, and other affiliated companies. Preference given to applicants who are undergraduates with financial need and best scholastic standing.

AUSTIN T. LEVY MEMORIAL: Income from $5,000 endowment awarded annually, with preference to needy and deserving graduates of Burrillville High School.

GEORGE C. MOORE COMPANY/FULFLEX, INC.: $1,500 awarded annually to deserving students, with preference to children of George C. Moore Company employees in Westerly and of Carr-Fulflex, Inc. in Bristol.

NATIONAL MERIT SCHOLARSHIP: Sponsored by the University of Rhode Island Foundation, a four-year scholarship with annual awards of at least one-half of the student's financial need, but not more than $1,500 per year.

*NORTHEAST INSTITUTE OF FOOD TECHNOLOGISTS, UNDERGRADUATE: $300 annual award established by the Northeast section of the Institute of Food Technologists for undergraduate students in the New England area who have a significant interest in furthering the development of food science. Selection based on interest in food science, academic excellence, personal character and extracurricular activities. Apply to chairman of All-University Food Science Committee.

RAU FASTENER COMPANY: Income from $5,000 endowment awarded annually to students who meet normal requirements of scholarship and need, with preference to children of Rau Fastener employees.

RAYTHEON COMPANY: $500 awarded annually to deserving students.

LOUIS M. REAM MEMORIAL: Income from $20,000 indowment awarded annually to deserving students.

RESERVE OFFICERS TRAINING CORPS (ROTC): One, two and three year scholarships awarded annually by the Department of the Army to qualified students enrolled in the ROTC program. Includes tuition, fees, textbooks, incidentals and $100 per month (tax free). Applications may be made at the Department of Military Science, 110 Keaney Gymnasium.

RESERVE OFFICERS TRAINING CORPS (ROTC four-year scholarships): Available to selected young men motivated toward a career in the Army. Includes tuition, books, laboratory fees, and $100 per month (tax free). Forward applications to Headquarters, First U.S. Army, Attn. AHAAG-CA, Fort Meade, Md. 20755 by early December of applicant's senior year in high school.

RHODE ISLAND HOSPITAL TRUST COMPANY: $2,000 available annually to Rhode Island residents, with preference given to sons and daughters of Rhode Island Hospital Trust Company employees.

RHODE ISLAND JUNIOR COLLEGE TRANSFER STUDENTS: Two awards up to $600 each, based on need, to graduating students of Rhode Island Junior College who have demonstrated high scholastic achievement.

PASQUALE AND ROSARIA RIZZI: Income from $20,000 endowment awarded annually to two or more junior and/or senior members of Beta Psi Alpha chapter of Theta Delta Chi fraternity on basis of scholarship, achievement and financial need.

MARY L. ROBINSON MEMORIAL: Income from fund established by the Will of Anna D. Robinson in memory of her mother, awarded to women students.

SAMUEL AND GERTRUDE J. ROSEN: Income from endowment fund, awarded to deserving men or women students.

N. EDWARD ROSENHIRSCH MEMORIAL: Income from $16,500 endowment, awarded to deserving students.

SCIENCE FAIR: $325 each to two incoming freshmen in recognition of outstanding exhibits in the annual R.I. Science Fair for high school students. Application must be made for this award.

EDWIN S. SOFORENKO FOUNDATION SCHOLARSHIP: Income from $10,000 endowment to be awarded annually to deserving students on the basis of need with first preference to employees of Insurance Underwriters, Inc., and their families.

STUDENT-TO-STUDENT: Income from $6,000 endowment fund awarded annually.

*ALICE M. TALBOT MEMORIAL: Income from endowment, established by a $10,000 gift from The Salvation Army in appreciation of Miss Talbot's past philanthropy to The Salvation Army, awarded annually to a University student selected in accordance with guidelines of the URI Century Club for scholarship recipients and with approval of the Director of Athletics of the University.

TRIANGLE CLUB OF KINGSTON: Minimum of $200 awarded annually to a deserving student.

UNCAS MANUFACTURING COMPANY: $500 awarded annually to deserving students.

UNITED STEELWORKERS OF AMERICA: $5,000 available annually for awards to deserving URI students who are sons or daughters of members of Providence Subdistrict #1 of United Steelworkers of America.

UNIVERSITY: The Board of Regents has made available a sum of money to be used for scholarships. While it is expected that in any year the great majority of these scholarships will be awarded to residents of Rhode Island, in certain exceptional cases out-of-state students may qualify.

UNIVERSITY OF RHODE ISLAND FOUNDATION: Endowment funds administered for the benefit of the University. Income is appropriated annually for scholarships to be awarded by the University Committee on Financial Aid to Students.

URI CLASS OF 1936: Income from $5,000 endowment awarded annually to a deserving student with preference to lineal decendents of alumni in the class of 1936.

URI PARENTS FUND: Income from $23,000 endowment.

URI PATRONS ASSOCIATION: Income from $14,700 endowment.

USS THRESHER: Tuition scholarships available to sons and daughters of the men lost aboard the submarine USS *Thresher*.

VETERANS' ADMINISTRATION (Junior G.I. Bill): Provides monthly payments while attending college to students whose parents have died or are permanently and totally disabled from disease or injury incurred in armed forces during Spanish-American War, World War I, World War II, or Korean conflict. Contact regional Veterans' Administration Office for details.

WASHINGTON TRUST COMPANY: $400 awarded annually to a deserving undergraduate student from Rhode Island.

WESTERLY LIONS CLUB: $500 awarded annually to needy graduates of Westerly High School with preference to upperclassmen.

GEORGE F. WESTON: Income of approximately $1,100 from a fund established by the Providence Technical High School Athletic Field Association awarded annually to graduates of Rhode Island high and college preparatory schools, with preference to former students and descendants of former students and teachers of Technical High School of Providence.

WOMAN'S SEAMEN'S FRIEND SOCIETY OF CONNECTICUT: Awards to undergraduate and graduate students from Connecticut who are in marine oriented programs and have financial need.

CARL R. WOODWARD: Income from $10,000 Alumni Association gift.

*WORLD WAR ORPHANS' EDUCATION FUND: Provided by the State of Rhode Island to help defray costs of education for children of veterans of either World War who died or were more than 50% disabled because of service. Fund is administered by the State

Department of Education, to which inquiries for details should be directed.

ARTS AND SCIENCES

BESSIE D. BELMONT MEMORIAL: Gift of $5,000 by Dr. and Mrs. Ralph S. Belmont in memory of his mother. Income awarded annually to an undergraduate majoring in natural sciences on basis of scholarship and/or diligent application and financial need.

*CHEMISTRY CONTEST: Winner of annual Chemistry Competitive Examination awarded $325 for the freshman year.

JOHN CLARKE TRUST: $2,000 available annually to worthy students preparing for careers in teaching or nursing with preference given to residents of Aquidneck Island.

*KENT COUNTY DENTAL AUXILIARY: $200 awarded annually to sophomore resident of Kent County. Based on scholarship, clinical ability, and need.

HENRY H. MACKAL: Income from $25,000 endowment awarded to deserving students majoring in engineering, mathematics, or the natural sciences.

*MAX ROSEN MEMORIAL: Income from $5,000 endowment awarded annually to a deserving student, preferably a junior, majoring in history with emphasis in American history.

LEONARD ECKERMAN SMITH MEMORIAL: Income from $5,000 endowment awarded to students at the University of Rhode Island having a major interest in public speaking.

*KEN STRIKER: $400 awarded annually to any sophomore or junior student who has demonstrated a genuine interest in economics and has financial need. Selection to be made by a committee composed of three faculty members of the Department of Economics.

*RUTH ERSKINE TRIPP MEMORIAL: $200 awarded annually to an undergraduate majoring in music and selected on the basis of an audition and financial need.

BUSINESS ADMINISTRATION

GEORGE A. BALLENTINE MEMORIAL: $200 awarded annually to a student in financial need.

DR. WINFIELD S. BRIGGS MEMORIAL: Income from $19,000 endowment available to students of accounting.

SAUL AND ALFRED GOLDSTEIN FUND: Income from $5,000 endowment available to a deserving student.

RHODE ISLAND ASSOCIATION OF INSURANCE AGENTS: Two $375 annual awards; one on the basis of financial need and one for scholastic ability, to Rhode Island residents in the College of Business Administration interested in insurance.

*RHODE ISLAND SOCIETY OF CERTIFIED PUBLIC ACCOUNTANTS: An annual scholarship award of $200 to the sophomore or junior majoring in accounting who plans to enter the field of public accounting and who has a good scholastic record.

*THE ARTHUR YOUNG FOUNDATION: $1,000 annual award to be distributed to not less than two, nor more than three, senior students with demonstrated need and scholastic excellence.

ENGINEERING

COTTRELL COMPANY: see under "Any College."

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, PROVIDENCE SECTION: $300 annual award to a deserving undergraduate majoring in electrical engineering and in need of financial aid.

HENRY H. MACKAL: Income from $25,000 endowment awarded to deserving students majoring in engineering, mathematics, or the natural sciences.

CHARLES A. MAGUIRE ASSOCIATES: Income from $5,000 endowment awarded to students in the field of engineering.

ARTHUR J. MINOR MEMORIAL: Income from $5,000 endowment available annually to deserving students.

GRANT H. POTTER MEMORIAL: Income from $50,000 endowment, a bequest of Warren L. Offer, for scholarships to deserving students, with preference to Rhode Island engineering students specializing in the fields of electronics or aeronautics.

NELSON C. WHITE: $500 awarded annually to students exhibiting most creative thinking in engineering.

HOME ECONOMICS

*BORDEN COMPANY HOME ECONOMICS: $300 awarded annually to a senior who has completed two or more courses in foods and nutrition and has achieved the highest grade average of all eligible students in all college work preceding the senior year.

*ELIZABETH W. CHRISTOPHER MEMORIAL: $250 annual award to a young woman in home economics who has completed her fourth semester at the University. Selection will be made on the basis of scholarship and evidence of potential for service and concern for the welfare of others.

*RHODE ISLAND STATE FEDERATION OF WOMEN'S CLUBS: $200 awarded annually to a worthy woman student from Rhode Island.

*RHODE ISLAND STATE GRANGE: Three annual awards of $200 each to students who have completed their sophomore year leading to a degree in any accredited college in Rhode Island. Student must be a member of a R.I. Subordinate Grange in good standing and have shown an active interest in Grange work for at least two years. Preference given students in home

economics and agriculture. Applications should be made to the Secretary of the R.I. State Grange on or before July 1 preceding junior year.

WOMAN'S NATIONAL FARM AND GARDEN ASSOCIATION (following three awards):

FORT BRANCH: $100 awarded annually to a woman in home economics from Cranston, R.I.

MABEL PERRIN: $200 awarded annually to a woman in home economics on the basis of scholastic ability and financial need. Restricted to Rhode Island residents.

RHODE ISLAND DIVISION: $100 awarded annually to a deserving student in home economics or horticulture. Restricted to Rhode Island residents.

NURSING

See also page 22.

M. ADELAIDE BRIGGS MEMORIAL: Income from $19,000 endowment available to nursing students.

JOHN CLARKE TRUST: $2,000 available to worthy students preparing for careers in teaching or nursing with preference given to residents of Aquidneck Island.

ESTHER A. WATSON MEMORIAL: Income from $5,000 endowment awarded annually to a deserving student with preference to graduates of The Pawtucket Memorial Hospital School of Nursing and then relatives of such graduates.

PHARMACY

See also page 22.

*AMERICAN FOUNDATION FOR PHARMACEUTICAL EDUCATION: Five $100 annual awards based upon scholastic achievement and need. Given by the AFPE with the understanding that the University will match the awards to the students selected.

*JOHN W. DARGAVEL FOUNDATION: $200 awarded annually to student in either his third, fourth or fifth year of pharmaceutical education and in good scholastic standing.

*BARNEY M. GOLDBERG FUND: Available to students in third, fourth or fifth year who have financial need.

*FLORENCE CHAMPLIN HAMILTON MEMORIAL: Income from $6,000 endowment awarded annually to a student in the College of Pharmacy on the basis of scholastic ability and financial need.

*EDWARD M. LEE MEMORIAL: Income from $5,000 endowment awarded annually to students from the Woonsocket and North Smithfield area.

*MRS. C. GORDON MACLEOD: $250 awarded annually to student(s) in the College of Pharmacy on the basis of scholastic ability and financial need.

*WILLIAM G. PECKHAM MEMORIAL: Established by the Will of Mary M. Peckham (Mrs. William G.), the scholarship provides $200 to a first-year student registered in pharmacy and continues until graduation if merited by scholastic performance.

*PROVIDENCE WHOLESALE DRUG COMPANY: $450 awarded annually to student in third, fourth or fifth year who has satisfactory academic standing and financial need.

RHODE ISLAND COLLEGE OF PHARMACY: Income from $139,000 endowment, for scholarships in the field of pharmacy and allied sciences.

*R.I. TRAVELING MEN'S AUXILIARY: $300 awarded annually to an upperclass student of the College of Pharmacy on the basis of scholastic ability and financial need.

*WATERBURY DRUGGISTS' AUXILIARY: $200 available annually to a worthy third-, fourth-, or fifth-year student from the area of Waterbury, Conn.

RESOURCE DEVELOPMENT

*ASHAWAY LINE AND TWINE MANUFACTURING CO. (Lloyd Robert Crandall Memorial): Income from $15,000 endowment awarded annually to a deserving student in Fisheries and Marine Technology.

*JOHN SAMUEL CLAPPER MEMORIAL: Income from $8,000 endowment established by Orville O. Clapper in honor of his father who pioneered the development of modern turf. Awards to outstanding juniors or seniors showing marked and abiding interest in turf culture.

*EPPLEY FOUNDATION FOR RESEARCH, INC.: $500 awarded annually to deserving students in Fisheries and Marine Technology.

*KELVIN HUGHES DIVISION, SMITHS INDUSTRIES, INC.: $500 annual award to a student in Commercial Fisheries program.

*ALICE P. MAYER: Three annual awards of $500 each for agricultural students who reside in Newport County. Preference to first- and second-year students.

*JEAN LOUISE PIMENTAL ('70) MEMORIAL: $200 annual award to a student in Animal Science, with preference to a woman from Rhode Island.

POINT JUDITH STRIPED BASS AND BLUE FISH TOURNAMENT: $500 awarded annually to a deserving student in Fisheries and Marine Technology.

*JOHN E. POWELL MEMORIAL: Income from $5,000 endowment available annually to students on basis of worth and need.

*RALSTON PURINA: $500 awarded annually to a student with interest related to animal agriculture. Selection on basis of scholarship, leadership, character, citizenship potential, and need.

*DR. J. T. KITCHIN MEMORIAL FELLOWSHIP: $200

awarded annually to students who have an interest in fruit growing.

*RHODE ISLAND STATE GRANGE: Three annual awards of $200 each to students who have completed the sophomore year leading to a degree in any accredited college in Rhode Island. Student must be a member of a R.I. Subordinate Grange in good standing and have shown an active interest in Grange work for at least two years. Preference to students in home economics and agriculture. Applications should be made to the Secretary of the Rhode Island State Grange on or before July 1 preceding junior year.

*CHARLES (SCOTTY) ROSS MEMORIAL: $200 awarded annually on the basis of need, character and scholarship to an upperclassman interested in the processing and production of quality milk and milk products.

WOMAN'S NATIONAL FARM AND GARDEN ASSOCIATION (RHODE ISLAND DIVISION): $100 awarded annually to a deserving student in horticulture or home economics. Restricted to Rhode Island residents.

SPECIAL AWARDS

DANFORTH LEADERSHIP TRAINING SCHOLARSHIP: All expenses for two weeks of leadership training at the American Youth Foundation Camp at Shelby, Michigan, awarded to an outstanding freshman with preference given to students having special interest in dairy, poultry or agricultural education. Same to a freshman in home economics.

DANFORTH SUMMER FELLOWSHIP: Awarded jointly by Danforth Foundation and Ralston Purina Co. to a junior. Preference to students with special interest in dairy, poultry, or agricultural education. Covers expenses during two weeks in St. Louis and vicinity and two weeks of leadership training at the American Youth Foundation Camp, Shelby, Mich. Basis is attainment in mental, physical, social, and religious development. Same fellowship awarded by Danforth Foundation to a junior in home economics.

RHODE ISLAND TUBERCULOSIS AND RESPIRATORY DISEASE ASSOCIATION AWARD: $500 awarded annually in honor of its former president, Harry L. Gardner, to a senior accepted by accredited medical school. Based on need. Apply to chairman of Faculty Pre-Medical Advisory Committee.

HISTORICAL OUTLINE

1888 State Agricultural School established.
Agricultural Experiment Station established.
Watson farm purchased as site.
1889 Taft Laboratory.
John H. Washburn appointed principal.
1890 South Hall.
1891 Davis Hall.
Ladd Laboratory.
1892 Rhode Island College of Agriculture and Mechanic Arts founded May 19.
John H. Washburn, President.
1894 First class graduated.
Alumni Association formed.
1895 Davis Hall burned and rebuilt.
1897 Lippitt Hall.
First *Grist* published.
1898 Preparatory school established.
1902 Homer J. Wheeler, Acting President.
1903 Kenyon L. Butterfield, President.
1904 Extension Department organized.
1906 Howard Edwards, President.
Greenhouse and Horticultural Building.
1907 Master's degree awarded for the first time.
1908 Preparatory school discontinued.
The *Beacon* established as a monthly.
Rho Iota Kappa (first fraternity).
1909 East Hall.
By charter amendment, name changed to Rhode Island State College.
1910 Theta Chi (first national fraternity).
1912 First fraternity house (Beta Phi, now Phi Gamma Delta).
1913 Ranger Hall.
Chapter of Phi Kappa Phi, national honor society.
1918 Academic work suspended April 28.
Student Army Training Corps.
1919 Academic work resumed January 2.
1921 Washburn Hall.
1924 Home Management House.
1928 Memorial Gateway.
Bliss Hall.
Edwards Hall.
Rodman Hall.
East Farm acquired.
1930 John Barlow, Acting President.
1931 Raymond G. Bressler, President.
President's House.
1932 Reorganization of college: Schools of Engineering, of Science and Business, and of Agriculture and Home Economics.
1934 Asa Sweet and Edward Sweet lands purchased.
1935 Chapter of Phi Sigma Society, national biological honor society.
1936 Chapter of Alpha Zeta, national agricultural society.
Narragansett Marine Laboratory.
Animal Husbandry Building.
Eleanor Roosevelt Hall.
Quinn Hall.
Central Heating Plant.
Peckham farm purchased.
1937 Green Hall.
1938 Meade Field.
1939 Board of Trustees of State Colleges created.
1940 John Barlow, Acting President.
1941 Carl R. Woodward, President.
1942 Accelerated war program, with summer term, initiated.
Reorganization of School of Science and Business into separate schools of Science and of Business Administration.
Engineering Experiment Station.
Industrial Extension Division.

1943 Army Specialized Training Unit assigned to college.
1944 Second Peckham farm purchased.
Industrial Extension Division replaced by Division of General College Extension.
War-accelerated program ended in September.
1945 Degree program in nursing.
Sherman farm acquired.
1946 Quonset hut colony erected as emergency housing project.
School of Home Economics.
1947 Chapter of Phi Alpha Theta, national history honorary society.
1948 School of Arts and Sciences.
Bachelor of Arts degree authorized by Board of Trustees.
1949 B.A. degree awarded for first time at June Commencement.
1950 Butterfield and Bressler Halls.
1951 Name changed to University of Rhode Island by act of General Assembly.
Chapter of Omicron Nu, national home economics honor society.
1952 Pastore Chemical Laboratory.
1953 Chapter of Sigma Xi, national scientific society.
Frank W. Keaney Gymnasium.
Laboratories for Scientific Criminal Investigation.
1954 Chapter of Tau Beta Pi, national engineering honor society.
Rhode Island Memorial Union.
1955 Chapter of Pi Sigma Alpha, national political science honor society.
1956 Ranger Hall remodeled and rededicated.
1957 College of Pharmacy.
1958 URI Foundation.
Francis H. Horn, President.
Degree of Doctor of Philosophy authorized by Board of Trustees.
Child Development Center.
Hutchinson, Peck and Adams Residence Halls.
Hope Dining Hall.
1959 Woodward Hall.
Administration Building.
Computer Laboratory.
Chapter of Rho Chi, national pharmaceutical honor society.
Potter Infirmary.
Wales and Kelley Halls.
1960 Fish Oceanographic Laboratory.
Independence Hall.
Davis Hall and East Hall remodeled.
Two-year program in dental hygiene.
Bureau of Government Research.
Faculty Senate established.
1961 Graduate School of Oceanography.
Quinn Hall and Washburn Hall remodeled.
Tucker, Merrow and Browning Halls.
Gilbreth Hall.
1962 Crawford Hall.
W. Alton Jones Campus.
Trident commissioned.
Chapter of Kappa Delta Pi, national education honor society.
1963 Bliss Hall remodeled.
Tyler Hall.
Graduate Library School.
Weldin and Barlow Halls.
1964 Chapter of Omicron Delta Epsilon, national economics honor society.
Fogarty Health Science Building.
Watson House restored.
1965 Addition to the Memorial Union.
University Library.
Law of the Sea Institute.
Sherman Maintenance Building.
Bachelor of Fine Arts and Bachelor of Music degrees authorized.
Research Center in Business and Economics.
Water Resources Research Center.
1966 Aldrich, Burnside, Coddington, Dorr, Ellery, and Hopkins Halls, and Roger Williams Center.
Justin S. Morrill Science Building.
Fine Arts Center (phase I).
Institute of Environmental Biology.
1967 Two-year program in commercial fisheries.
Ballentine Hall.
F. Don James, Acting President.
1968 Kelley Hall Research Annex.
Pell Marine Science Library.
Horn Laboratory.
First Sea Grant.
Werner A. Baum, President.
New England Marine Resources Information Program.
1969 Home Management Center.
Chapter of Sigma Pi Sigma, national physics honorary society.
Chapter of Sigma Delta Pi, national Spanish honorary society.
Heathman Hall.
Faculty Center.
Dental hygiene bachelor's program.
International Center for Marine Resource Development.
1970 Fayerweather Hall.
Gorham Hall.
Marine Advisory Service.
Chapter of Beta Gamma Sigma, national business administration honorary society.
1971 Tootell Physical Education Center.
Fine Arts Center (phase II).
Conference Center, Jones Campus.
Administrative Services Center.
Chapter of Beta Alpha Psi, national accounting honorary society.
Board of Regents for Education (Education Act of 1969) takes over direction of higher education.
Named one of first four "sea grant" colleges.
1972 Biological Sciences Building.
Chafee Social Science Building.
University College established.
Coastal Resources Center.
Graduate apartment complex.
1973 Research Aquarium, Narragansett Bay Campus.

SUMMARY OF ENROLLMENT, FALL TERM 1972

	Men	Women	Total
COLLEGE OF ARTS AND SCIENCES			
Bachelor of Arts	1152	1212	2364
Bachelor of Science			
Biology	206	79	285
Chemistry	29	3	32
Dental Hygiene	—	57	57
Geology	29	2	31
Mathematics	33	11	44
Medical Technology	12	47	59
Physical Education	151	86	237
Physics	16	1	17
Bachelor of Fine Arts	24	35	59
Bachelor of Music	36	26	62
Associate in Science (2 year program) Dental Hygiene	—	13	13
	1688	1572	3260
COLLEGE OF BUSINESS ADMINISTRATION			
Accounting	160	13	173
Business Education	21	22	43
Finance	49	5	54
General Business Administration	138	9	147
Insurance	18	—	18
Management Science	19	5	24
Marketing Management	72	11	83
Office Administration	—	13	13
Organizational Management and Industrial Relations	84	4	88
Business Unassigned	93	8	101
	654	90	744
COLLEGE OF ENGINEERING			
Chemical Engineering	46	1	47
Civil and Environmental Engineering	161	2	163
Electrical Engineering	132	3	135
Engineering Science	7	1	8
Industrial Engineering	40	—	40
Mechanical Engineering and Applied Mechanics	64	3	67
Mechanical Engineering—Ocean Engineering Option	9	—	9
Engineering Unassigned	6	—	6
	465	10	475
COLLEGE OF HOME ECONOMICS			
Child Development and Family Relations	1	172	173
Food and Nutritional Science	2	63	65
General Home Economics	—	25	25
Home Economics Education	—	102	102
Textiles, Clothing and Related Art	—	105	105
Home Economics Unassigned	—	36	36
	3	503	506

	Men	Women	Total
COLLEGE OF NURSING	18	253	271
COLLEGE OF PHARMACY	206	94	300
COLLEGE OF RESOURCE DEVELOPMENT			
Agricultural Science	70	19	89
Agricultural Technology	115	26	141
Natural Resources	144	26	170
Associate in Science (2 year program) Commercial Fisheries	38	—	38
	367	71	438
UNASSIGNED	4	2	6
UNIVERSITY COLLEGE—Preference indicated:			
Arts and Sciences	395	449	844
Business Administration	186	35	221
Engineering	133	3	136
Home Economics	1	151	152
Nursing	2	84	86
Pharmacy	78	47	125
Resource Development	131	25	156
Unassigned	164	119	283
	1090	913	2003
TOTAL UNDERGRADUATES	4494	3509	8003
GRADUATE STUDENTS			
Degree	1162	785	1947
Non-Degree	178	161	339
	1340	946	2286
SPECIAL PART-TIME UNDERGRADUATES	111	147	258
DIVISION OF UNIVERSITY EXTENSION			5484
SUMMER SESSION			
Term I — 1972			3040
Term II—1972			1968
TOTAL ENROLLMENT			21,039

Calendar

1973-1974

FIRST SEMESTER

Sept. 4, 5	University registration
Sept. 6, Thursday	Classes begin, 8:00 a.m. University Faculty Meeting, 3:30 p.m.
Oct. 8, Monday	Holiday, Columbus Day
Oct. 9, Tuesday	Monday classes meet
Oct. 22, Monday	Holiday, Veterans Day
Oct. 23, Tuesday	University Faculty Meeting, 3:30 p.m.
Oct. 26, Friday	Mid-semester
Nov. 12-16	Registration
Nov. 21, Wednesday	Thanksgiving recess begins, 5:00 p.m.
Nov. 26, Monday	Thanksgiving recess ends, 8:00 a.m. Last day of classes
Dec. 22, Saturday	Christmas recess begins, 1:00 p.m.
Jan. 2, Wednesday	Christmas recess ends, 8:00 a.m.
Jan. 3-11	Final examinations
Jan. 14, Monday	Last day for grades, 9:00 a.m.

SECOND SEMESTER

Jan. 21, 22	University registration
Jan. 23, Wednesday	Classes begin, 8:00 a.m.
Feb. 5, Tuesday	University Faculty Meeting, 3:30 p.m.
Mar. 8, Friday	Mid-semester
Apr. 12, Friday	Spring recess begins, 12:00 noon
Apr. 22, Monday	Spring recess ends, 8:00 a.m.
Apr. 22-26	Registration
May 7, Tuesday	University Faculty Meeting, 3:30 p.m.
May 11, Saturday	Classes end, 1:00 p.m.
May 11-13	Reading days
May 14-22	Final examinations
May 24, Friday	Last day for grades, 9:00 a.m.
June 2, Sunday	Commencement Exercises

SUMMER SESSION 1974

June 10, Monday	First term begins
July 4, Thursday	Holiday, Independence Day
July 12, Friday	First term ends
July 15, Monday	Second term begins
Aug. 12, Monday	Holiday, Victory Day
Aug. 16, Friday	Second term ends

Index

Academic and Service Buildings and Areas

1 Administration Building C3
2 Administrative Services Center *campus mail* A1
3 Art Studios D3
4 Athletic Bubble D1
5 Ballentine Hall *business administration* B3
6 Beck Field D1
7 Biological Sciences Building A3
8 Bliss Hall *engineering* B4
9 Career Planning and Placement (70 Lower College Rd.) C3
10 Catholic Center B4
11 Chafee Social Science Center A3
12 Child Development Center E3
13 Community Planning (36 Upper College Rd.) D4
14 Community Planning *studios* A7
15 Crawford Hall *chemical engineering* B4
16 Dairy Barn B2
17 Davis Hall C3
18 East Hall *physics* B4
19 Edwards Hall C4
20 Episcopal Center E3
21 Experimental Turf Plots B1
22 Faculty Center B4
23 Fine Arts Center B4
24 Fire Station B5
25 Fogarty Health Science Building *nursing and pharmacy* D3
26 Gilbreth Hall *industrial engineering* B4
27 Green Hall D4
28 Greenhouses A4
29 Home Management House E3
30 Horticulture Gardens A4
31 Independence Hall D4
32 Information and Police D3
33 International House B1
34 Keaney Gymnasium D1
35 Kelley Hall *electrical engineering* B4
36 Library B3
37 Library School, *graduate* (74 Lower College Rd.) C3
38 Lippitt Hall B3
39 Meade Field B2
40 Memorial Union D3
41 Morrill Science Building *life sciences* D3
42 Oceanography (19 Upper College Rd.) E4
43 Pastore Chemical Laboratory D3
44 Personnel and Purchasing (80 Lower College Rd.) C3
45 Planetarium B4
Police and Information (#32) D3
46 Potter Building *infirmary* C2
47 Lower College Road No. 34 D3
48 Upper College Road No. 31 D4
49 Quinn Hall *home economics* C3
50 Ranger Hall *biological sciences* C4
51 Lower College Road No. 37 D3
52 Rifle Range B1
53 Rodman Hall B3
54 Roosevelt Hall C3
55 Sherman Building *maintenance* B1
56 Taft Hall B3
57 Tennis Courts A3, E1
58 Tootell Physical Education Center C1
59 Tyler Hall *computer laboratory* A3
60 Upper College Road No. 85 C4
61 Upper College Road No. 95 C4
62 Wales Hall *mechanical engineering* B4
63 Washburn Hall C4
64 Water Towers A5, B4
65 Watson House B3
66 Woodward Hall *resource development* B3

Residence and Dining Halls

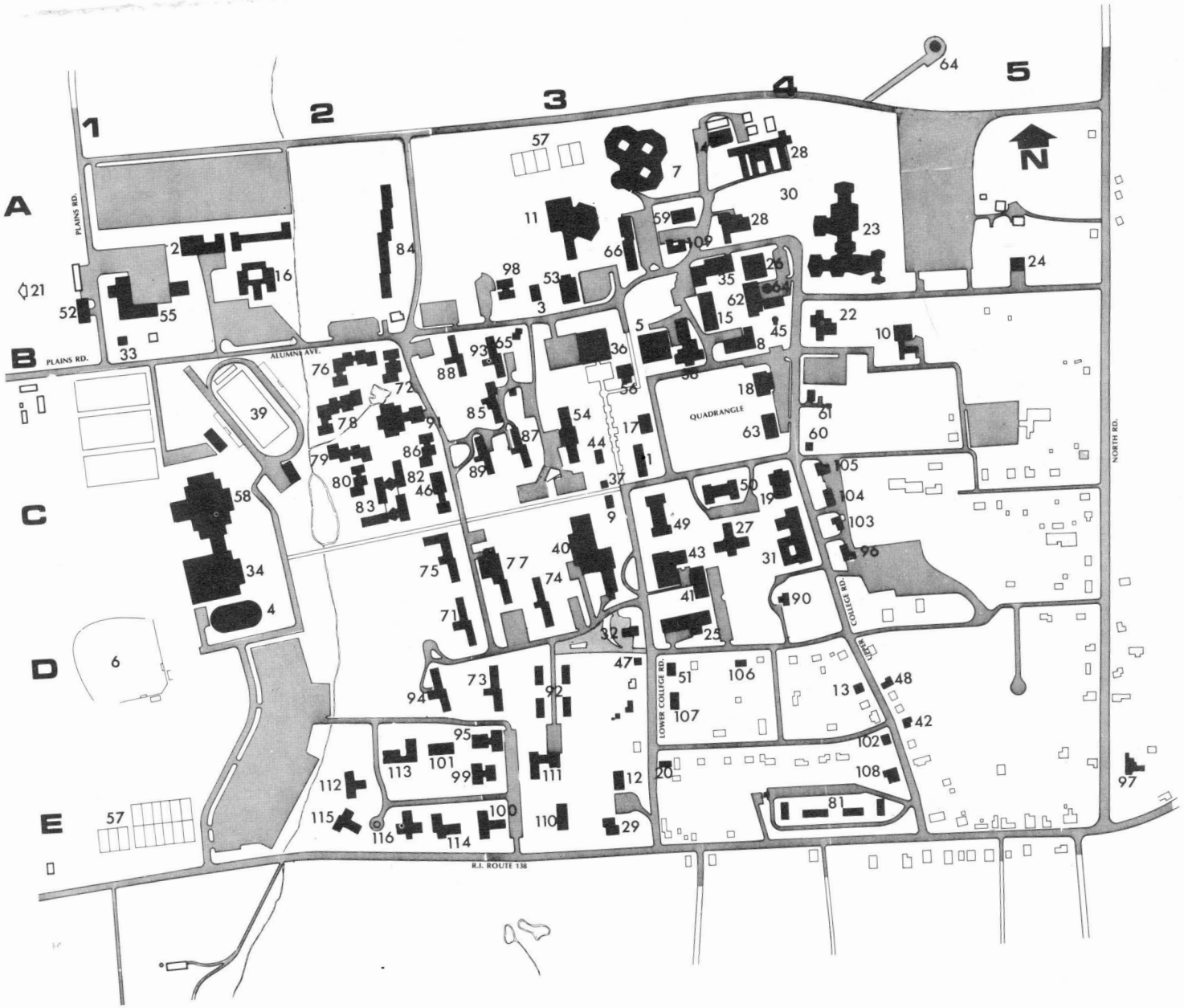
71 Adams Hall D2
72 Aldrich Hall B2
73 Barlow Hall D2
74 Bressler Hall D3
75 Browning Hall D2
76 Burnside Hall B2
77 Butterfield Hall *residence and dining* D3
78 Coddington Hall B2
79 Dorr Hall C2
80 Ellery Hall C2
81 Faculty Apartments E4
82 Fayerweather Hall C2
83 Gorham Hall C2
84 Heathman Hall A2
85 Hope Hall *dining* B3
86 Hopkins Hall C2
87 Hutchinson Hall C3
88 Merrow Hall B2
89 Peck Hall C3
90 President's House D4
91 Roger Williams Commons *housing office and dining* C2
92 Student Apartments D3
93 Tucker Hall B3
94 Weldin Hall D2

Fraternities

95 Alpha Epsilon Pi E2
96 Chi Phi D4
97 Lambda Chi Alpha E5
98 Phi Gamma Delta B3
99 Phi Kappa Psi E2
100 Phi Mu Delta E2
101 Phi Sigma Delta E2
102 Phi Sigma Kappa E4
103 Sigma Alpha Epsilon D4
104 Sigma Chi C4
105 Sigma Nu C4
106 Tau Epsilon Phi D4
107 Tau Kappa Epsilon D3
108 Theta Chi E4
109 Theta Delta Chi B3

Sororities

110 Alpha Chi Omega E3
111 Alpha Delta Pi E3
112 Alpha Xi Delta E2
113 Chi Omega E2
114 Delta Zeta E2
115 Sigma Delta Tau E2
116 Sigma Kappa E2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