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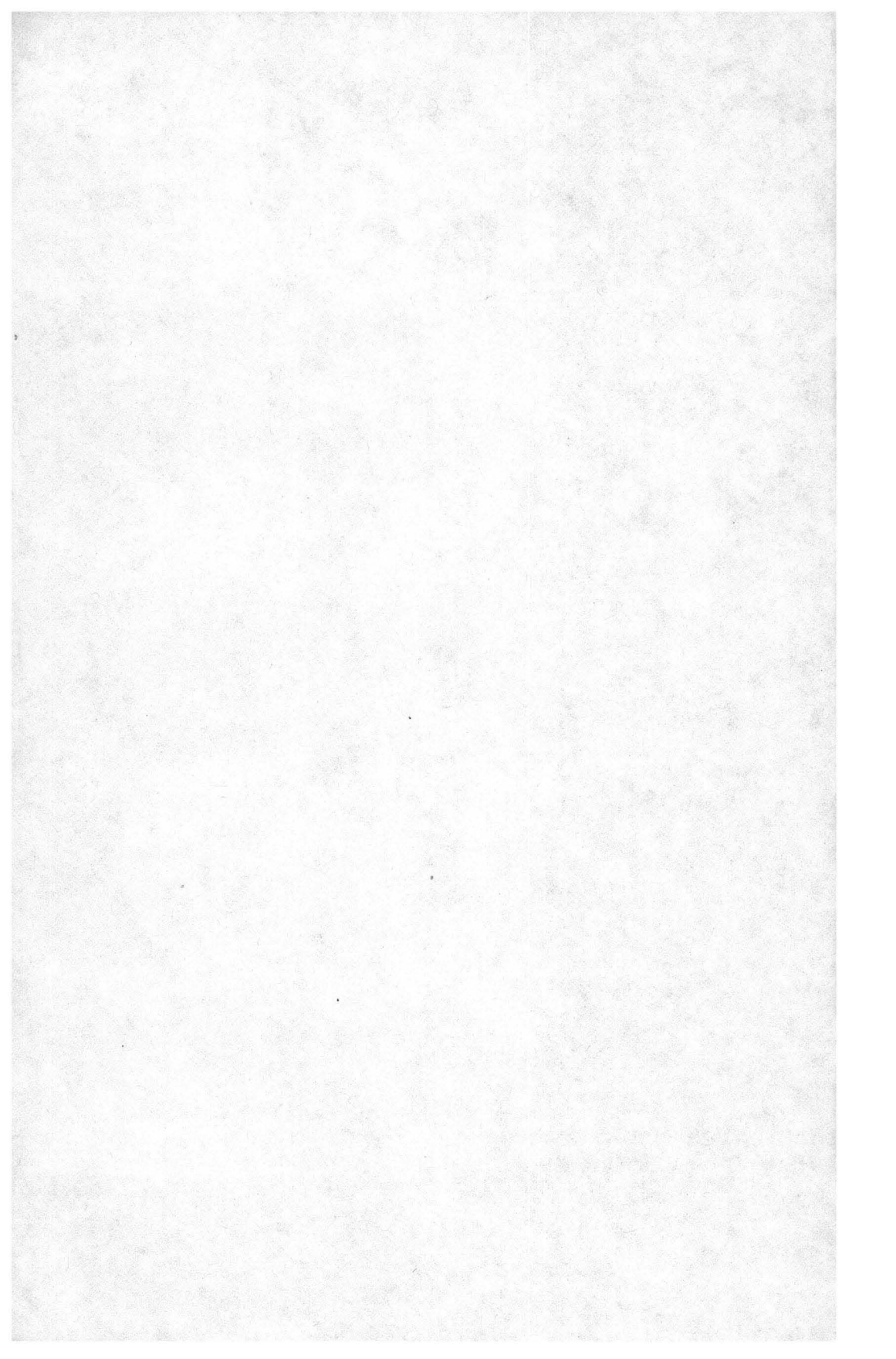
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UNDERGRADUATE
BULLETIN
STATE UNIVERSITY
OF NEW YORK AT STONY BROOK

STONY BROOK 1976-77

1976-77
UNDERGRADUATE
BULLETIN

STATE UNIVERSITY
OF NEW YORK AT STONY BROOK



Volume XIV

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Address and Phone

The mailing address of the University is:
State University of New York at Stony Brook
Stony Brook, New York 11794

The general telephone number is:
(516) 246-5000

All programs, regulations and schedules of dates at the State University of New York at Stony Brook are offered subject to change or withdrawal depending upon the availability of funds and the approval of programs by appropriate State authorities.



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Academic Calendar

Fall Semester 1976

August 24, Tuesday	CED Final Registration and Payment of Fees for Continuing Students
August 26, Thursday	CED Final Registration and Payment of Fees for All, New Beginning Students
August 29, Sunday	Foreign Students Must Arrive
August 29-September 6 Sunday-Monday	Foreign Student Orientation
August 30, Monday	All Residence Halls Open Begin Final Registration Week and Payment of Fees (or properly deferred) for All Students not Previously Registered (schedule announced prior to registration)
August 31-September 2 Tuesday-Thursday	Undergraduate Student Orientation for All Students not Having Previously Participated
September 6, Monday	Labor Day (no classes; offices closed)
September 7, Tuesday*	Classes Begin*—Late Registration Period Begins with \$20 Late Fee Assessed
September 17, Friday	End of Late Registration Period for All Graduate, Undergraduate and CED Students

*Classes in the Health Science Center begin on this date but follow a modular schedule consistent with this calendar. *NOTE*, however, that courses may vary in length and require attendance during periods when the rest of the campus is not in session.

	LAST DAY for Undergraduate Students to ADD a Course
October 1, Friday	LAST DAY for Graduate Students to ADD or DROP a Course LAST DAY for All Students (except CED) to FILE for DECEMBER GRADUATION Who Have not Previously Filed LAST DAY for Graduate Students to FILE DEGREE CARDS in the Graduate School Office for DECEMBER GRADUATION
October 4, Monday	Yom Kippur (no day or evening classes)
October 8, Friday	LAST DAY for Undergraduate Students to DROP a Course without Withdrawing from the University LAST DAY for Undergraduate Student to CHANGE COURSES to or from Pass/No Credit
October 19, Tuesday	LAST DAY for Final Payment of Fees for Fall Semester
October 30, Saturday	First Quarter Fall Housing Period Ends
November 1, Monday	LAST DAY for REMOVAL of INCOMPLETES and NR (No Record) GRADES for All Students from Spring Semester and Summer Session
November 8, Monday	ADVANCE REGISTRATION Period Begins for Spring Semester for all Students Including CED (schedule announced prior to registration)
November 24, Wednesday	Thanksgiving Recess Begins at Close of Classes
November 29, Monday	Classes Resume
December 17, Friday	LAST DAY of Classes—LAST DAY to WITHDRAW from the University
December 18, Saturday	Final Examinations Begin—Final Grades Due in Registrar's Office 72 Hours after Last Class Meeting, or after Scheduled Examination or as arranged

	ADD/DROP and/or SECTION CHANGE Period Begins
February 4, Friday	End of Late Registration Period for All Students Including CED Students
	LAST DAY for Undergraduate Students to ADD a Course
February 11, Friday	LAST DAY for All Students (except CED) to FILE for MAY GRADUATION Who Have not Previously Filed
February 15, Tuesday	LAST DAY for Graduate Students to ADD or DROP a Course
February 22, Tuesday	LAST DAY for CED Students to FILE for MAY GRADUATION
February 25, Friday	LAST DAY for Undergraduate Students to DROP COURSES without Withdrawing from the University
	LAST DAY for Undergraduate Students to CHANGE COURSES to or from Pass/ No Credit
	LAST DAY for Graduate Students to FILE DEGREE CARDS in the Graduate School Office for MAY GRADUATION
March 4, Friday	LAST DAY for Final PAYMENT of FEES for the Spring Semester
March 19, Saturday	First Quarter Spring Housing Period Ends
April 2, Saturday	Spring Recess Begins at Close of Classes
April 11, Monday	Classes Resume
April 11-15 Monday-Friday	Advance Room Deposits for Fall 1977 Semester Due
April 11, Monday	LAST DAY for REMOVAL OF INCOMPLETES and NR (No Record) Grades from the Fall Semester for All Students

- April 25, Monday ADVANCE REGISTRATION Period Begins for Fall Semester for All Students Including CED Students (schedule announced prior to registration)
- ADVANCE REGISTRATION for 1977 Summer Session (except CED) with Summer Term Fees Payable at Time of Registration
- LAST DAY for Graduate Students to SUBMIT THESES and DISSERTATIONS for MAY GRADUATION
- LAST DAY for PAYMENT of FEES by MAIL for Fall Semester, July 26 (payment returned if postmarked later), LAST DAY for In-Person Payment, August 20
- April 25 & 27
Monday & Wednesday CED Advance Registration and Payment of Fees for Summer Term I and/or Summer Term II
- May 2, Monday LAST DAY for Departments to SUBMIT COMPLETION STATEMENTS for May Doctoral Candidates
- May 13, Friday LAST DAY of Classes—LAST DAY to WITHDRAW from the University
- May 16, Monday Final Examinations Begins—Final Grades Due in Registrar's Office 72 Hours after Last Class Meeting, or after Scheduled Examination, or as Arranged
- May 21, Saturday Final Examinations End—Spring Semester Ends
- All Residence Halls Close
- May 22, Sunday Commencement
- May 24, Tuesday LAST DAY for Departments to SUBMIT COMPLETION STATEMENTS for May Masters Candidates

1977 Summer Session

- May 26, Thursday Final Registration and Payment of Fees for Summer Term I and/or Summer Term II and Special Terms for All Students not Previously Registered except CED Students (CED Students see special instructions issued separately)
- May 30, Monday Memorial Day (no classes; offices closed)
Summer Session Residence Halls Open
- May 31, Tuesday Classes Begin—Late Registration Period Begins with \$20 Late Fee Assessed
- June 2, Thursday Late Registration Period Ends for All Students

LAST DAY to ADD a Course
- June 10, Friday LAST DAY for Undergraduate Students to CHANGE COURSES to or from Pass/No Credit
- June 22, Wednesday LAST DAY to DROP a Course without Withdrawing from Summer Term I

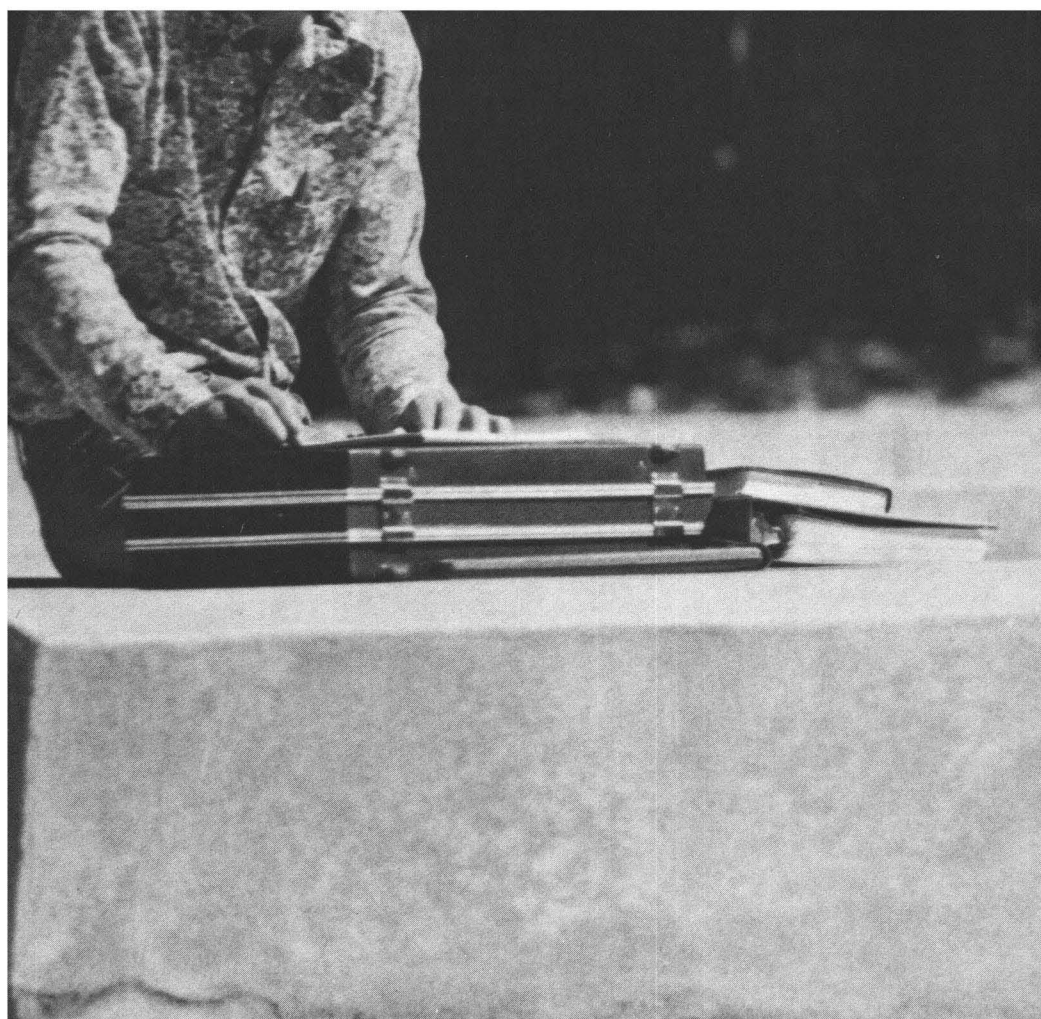
LAST DAY for CED Students to FILE for AUGUST GRADUATION
- July 1, Friday Summer Term I Ends—Final Grades Due in the Registrar's Office 72 Hours after Last Class Meeting or as Arranged

LAST DAY for All Students (except CED) to FILE for AUGUST GRADUATION Who Have not Previously Filed

LAST DAY for Graduate Students to FILE DEGREE CARDS in the Graduate School Office for AUGUST GRADUATION
- July 4, Monday Independence Day (no classes; offices closed)

- July 5, Tuesday Final Registration and Payment of Fees for Summer Term II and Special Terms for All Students not Previously Registered
- July 6, Wednesday Classes Begin—Late Registration Period Begins with \$20 Late Fee Assessed
- July 8, Friday Late Registration Period Ends for All Students
- LAST DAY to ADD a Course
- July 15, Friday LAST DAY for Undergraduate Students to CHANGE COURSES to or from Pass/No Credit
- July 27, Wednesday LAST DAY to DROP a Course without Withdrawing from Summer Term II
- August 5, Friday Summer Term II Ends—Final Grades Due in the Registrar's Office 72 Hours after Last Class Meeting or as Arranged
- August 12, Friday LAST DAY for Departments to SUBMIT COMPLETION STATEMENTS for August Masters and Doctoral Candidates
- August 19, Friday All Summer Terms End—End of Summer Session





An Introduction to Stony Brook

Background

"The initial mission of the State University of New York at Stony Brook was to become an institution of national stature in the time-honored and traditional terms of the outstanding private universities and of such public institutions as Berkeley, Michigan, and Illinois. In this it has succeeded outstandingly well. It is remarkable in what short a time Stony Brook has come to be thought of as being among that distinguished company."

That observation, from the opening paragraph of a Middle States Association reaccreditation report dramatically summarizes an extraordinary development process that began less than two decades ago. Since then, the State University of New York at Stony Brook has grown to be one of the nation's major public university centers, completing nearly \$500 million in all campus construction and consolidating extensive academic programs, all within perhaps the shortest time span in the history of higher education.

What was to become the State University of New York at Stony Brook began in 1957 at Oyster Bay, Long Island, as a State University College to prepare secondary school teachers of math and science. In 1962, with a new mandate to become the State University's fourth regional university center, the young school moved to a parcel of land in Stony Brook given to the state by industrialist-philanthropist Ward Melville.

Since then, Stony Brook has grown to encompass 81 buildings on 1100 acres. The faculty has grown from about 175 to 1400, the student body from 1000 to 16,000, and the annual budget from about \$3 million to \$69 million.

Of the 64 institutions comprising the State University of New York, Stony Brook is the only comprehensive university center for the entire New York metropolitan region, one of the nation's fastest growing, most complex population areas. In carrying out its mission, including research and public service in this region, Stony Brook strives to be a responsive university of excellence.

Location

Stony Brook is about 60 miles east of Manhattan on the wooded north

shore of Long Island, within a few miles of picturesque villages, harbors and beaches. The Long Island Expressway and the Long Island Rail Road provide the campus ready access to the cultural, scientific, and commercial resources of New York City.

Degree Programs

The broad range and great strength of programs at Stony Brook give undergraduates opportunities to pursue both traditional and innovative curricula. There is room to sample widely, collecting insights or searching for a career, or to delve deeply into the field of one's choice and have the opportunity to study with nationally famous scholars.

The University presently offers degree study through about 100 departmental and interdisciplinary programs organized within four basic academic units. The *College of Arts and Sciences* encompasses most current programs, (see p. 25). The *Health Sciences Center*, the fastest growing University unit with extensive new facilities under construction, makes it one of the largest, most sophisticated centers being developed anywhere for medical, dental and related health professions work. The *College of Engineering and Applied Sciences* has gained wide recognition for its innovative programs emphasizing the intensive relationship between technology and people, programs which define Engineering as the intelligent use of science for the benefit of people. The University's newest academic unit is the *W. Averell Harriman College for Urban and Policy Sciences*, which was established last fall as one of the nation's first centers devoted to comprehensive education and research for the public sector, with programs to prepare governmental service professionals who can combine highly technical expertise with broad analysis of policy. Several thousand students, for the most part teachers and other professionals, are enrolled in the *Center for Continuing Education*. Courses offered, which are taught by faculty from all campus departments, vary from the general to the specialized and lead to an interdisciplinary, 30-unit, non-thesis Master of Arts in Liberal Studies degree. Admission requires a Bachelor's degree. The University's *Graduate School* draws on the resources of all University units to offer 24 graduate programs leading to the masters degree and 20 leading to the doctorate, many of which have received exceptionally high ratings from evaluation agencies. (See Index for detailed section listings for each college and Health Sciences Center.)

The following degrees are offered: Bachelor of Arts, B.A.; Bachelor of Engineering, B.E.; Bachelor of Science, B.S.; Master of Arts, M.A.; Master of Arts in Liberal Studies, M.A./L.S.; Master of Music, M.Mus.; Master of Science, M.S.; Master of Social Welfare, M.S.W.; Doctor of Dental Surgery, D.D.S.; Doctor of Medicine, M.D.; and Doctor of Philosophy, Ph.D.

Campus

The Frank Melville, Jr. Memorial Library provides both an intellectual and physical focal point for the campus. The combined collections of the Melville Library, its five departmental branch libraries and the University's Health Science Library this year reached 1,000,000 volumes. In addition, library collections include 1,200,000 items in micro-format and subscriptions to 9,187 periodicals. Radiating out from the center campus Melville Library (see campus map, page 401) in a circular zone pattern are the major academic buildings for arts and sciences and engineering, the Van de Graaff nuclear accelerator, the Administration Building, Lecture Center, Laboratory-Office Building, Instructional Resources Center, Computing Center (its new sophisticated Univac 1110 dual processor system provides both batch processing and interactive time sharing services for student and faculty research and administrative data processing), Stony Brook Union, Gymnasium and other service and activities buildings. The first phase of Stony Brook's new Fine Arts Center has opened, between the Library and Administration Building, with a second Fine Arts phase to be finished in 1977, providing extensive performing arts facilities along with an outdoor plaza connecting the Library, Stony Brook Union and Fine Arts Center in the middle of the campus. Under construction southeast of the Administration Building is a new Social and Behavioral Sciences Building to be completed in 1978.

Encircling the academic buildings are six residential quadrangles with living space for 1000 students each. They are the basic social units for on-campus students, providing residence halls, dining rooms, and a diversity of student-sponsored enterprises and social facilities. Each quadrangle consists of 3-5 coeducational colleges, or residence halls, housing 200-400 students each. About half the undergraduate students live on campus.

South of the main campus is the 26-acre Ashley Schiff nature preserve. Beyond these woods and linked to the Main Campus by a free shuttle bus service is the South Campus, where 11 functionally adaptable single story buildings provide flexible space for newer, growing University programs. (A number of Health Sciences programs, for example, are still located on the South Campus while permanent Health Sciences facilities are being completed at the east end of the campus.) The permanent Health Sciences Center facilities include an extensive seven-story megastructure. Rising above the megastructure is a 10-story Clinical Sciences tower. Both megastructure and tower are largely completed with many Health Sciences programs scheduled to move into these facilities in 1976. The concrete Clinical Sciences tower already has become a landmark as Long Island's highest building above sea level. A 540-bed University Hospital tower of equal height is under construction southeast of and linked to the Clinical Sciences tower. Scheduled for completion in 1978 is a Basic Health Sciences tower, located northwest of the Clinical Sciences

tower, also made of concrete and about half the height of the Clinical Sciences tower and the Hospital. A final smaller structure, rising from the south end of the present megastructure is being planned for Dental Medicine, with a 1980 completion date. A 1000-car parking structure for the Health Sciences complex is scheduled for construction during 1976, north of the Clinical Sciences tower.

Students

Stony Brook's 1975-76 enrollment was about 16,000 (10,500 undergraduates and 5,500 graduate students, including about 2000 part-time graduate students enrolled in continuing education programs). About 70% of Stony Brook's undergraduates come from Nassau and Suffolk counties, 89% are from the New York metropolitan area and 97% are from New York State. International students from 60 countries represent about 4% of the total student body.

The State University of New York at Stony Brook does not discriminate on the basis of race, sex, religion, national origin, age, physical disability or marital status—in admission, employment and treatment of students and employees.

Faculty

The vast majority of Stony Brook's 1400 faculty members hold doctoral degrees and 90% or more are engaged in currently active research leading to publication, much of it supported by external grants and contracts. The Middle States Association had high praise for Stony Brook's faculty in its recent campus reaccreditation report, noting that "*several departments rank among the top in the country and most are of a very high level of quality as measured in terms of professional reputation and scholarly activities.*" The student-faculty ratio is about one faculty member for every 16 students.

C. N. Yang, Nobel Prize-winning physicist, serves as Albert Einstein Professor and Director of the Institute for Theoretical Physics. Pulitzer Prize-winning poet Louis Simpson is a member of the English Department faculty. The rank of Distinguished Professor, an honor conferred by the State University Trustees, is held by Stony Brook's systematic philosopher Justus Buchler, eclectic social scholar Lewis Coser, and geneticist Bentley Glass. The recent established State University Distinguished Teaching Professor designation, awarded in recognition of outstanding teaching ability, is held by Stony Brook Biologist Elof A. Carlson who in 1972 became one of only 12 faculty members nationwide receiving the prestigious E. Harris Harbison Award for Gifted Teaching. The distinguished British astronomer and scientist, Sir Fred Hoyle, was among well known visiting professors at Stony Brook in 1975.

Research

Stony Brook currently draws about \$12.5 million annually in non-state grants and funds to support campus research programs. The bulk of

these monies, over 80%, is received from the federal government or its agencies, the remainder comes from corporations and foundations. Lunar rocks, cancer, urban problems, holography, research on the social history of English nobility, the psychology of political attitudes and behavior, and the role of symmetry in the arts and sciences are a few examples of the approximately 400 subjects currently under examination on campus. Academic publications emanating from the University include: *American Comparative Literature Association Newsletter*, *American Naturalist*, *Journal of Biological Psychiatry*, *Journal of Biomedical Materials Research*, *The Physics Teacher*, *Quarterly Review of Biology*, *Stony Brook Anthropologist*, the *Stony Brook Engineer*, and the *Quarterly Report of the Program on Technology and Society*.

Community Ties

Numerous concerts, lectures, films, theatre productions, art exhibits and sports events on campus are open to the public each semester.

With over 5000 people on the overall campus payroll, Stony Brook is one of Long Island's largest single employers. The University generates over \$100 million annually in direct economic impact in the Long Island region, with a rippling effect of perhaps an additional \$100 million or more.

In many ways, the University works with surrounding communities to provide services and to help solve area problems. The Computing Center assists numerous colleges, research centers and governmental agencies. Student teachers serve in local schools and numerous educational projects involve close University-school cooperation. The Point of Woods School at the University helps disruptive elementary schoolchildren to be productive students. In health fields, Stony Brook students learn and work in Long Island hospitals and other health-related facilities. The Marine Sciences Research Center studies and makes recommendations regarding regional erosion and pollution problems, and the W. Averell Harriman College for Urban and Policy Sciences works with local governments to help solve problems in fields such as sanitation, waste disposal, zoning and transportation. The Economic Research Bureau conducts research, training and service activities in fields such as educational planning, property ownership, shipping, taxation and poverty. A thousand or more Stony Brook students annually participate in community volunteer programs in tutoring, recreation, health care and other areas. Ecology students recently, for example, developed plans for a community nature study preserve near the Stony Brook campus. The Association for Community-University Cooperation works to develop positive relationships between the University and the community through an annual series of "town-gown" programs and events.

Special Centers and Institutes

The *Center for Contemporary Arts and Letters* develops campus art holdings and sponsors visits by practitioners and critics of the arts;

the *Center for Curriculum Development* generates new kinds of courses for elementary and secondary education; the *Economic Research Bureau* brings together the University and public and private agencies in regional research efforts of mutual interest; the *Engineering Concepts Curriculum Project* is a program designed to develop technological literacy in non-science-oriented high school students nationwide; the *Institute for Advanced Studies of World Religions* with its 40,000 volume library seeks to facilitate the study and development of world religions and philosophy with emphasis on Buddhism, Islam and Hinduism; the *Institute for Theoretical Physics* has a faculty of a dozen scholars researching all areas of theoretical physics; the *Institute for Urban Sciences Research* organizes and carries out research pertaining to policy problems and issues; the *Institute of American Studies* funds a summer graduate program for outstanding high school social studies teachers; the *Instructional Resources Center*, in cooperation with faculty members and departments, helps develop more effective teaching methods through the use of media and other technical aids; the *International Art of Jazz* is committed to the promotion, preservation and presentation of jazz music; the *Marine Sciences Research Center* administers statewide research projects, offers research cruises, and performs studies in oceans, bays, harbors, lakes and a University-owned tidal salt marsh near campus; the *Museum Computer Network*, now headquartered on campus, works to help many of the nation's top museums and other institutions make their collections and related information more accessible by computerizing museum files and archives; the *Research Foundation* administers all gifts, grants and contract funds supporting sponsored research, training and related programs carried out by, or supervised by, University faculty; the *Science and Mathematics Teaching Center* assists Long Island math and science teachers in curriculum planning and the development of special resource materials; and the *Stony Brook Foundation* seeks and encourages non-state support for the development and enrichment of programs at Stony Brook and administers the majority of the University's scholarships, loans and endowment accounts in conjunction with the Financial Aid Office. The newest institutes on campus are the *Long Island Research Institute*, for mental health and behavioral sciences research. The newest special center is tStony Brook's branch of *Empire State College*, the State University of New York's non-traditional learning arm for degree study without formal class attendance.

Campus Activities

A wide variety of lectures, seminars, concerts, exhibits, theatrical performances, and movies are scheduled regularly during the academic year. Some recent well-known speakers at Stony Brook have included writers William Burroughs, Isaac Asimov, Robert Caro and Alain Robbe-Grillet, political and social commentator Dick Gregory, consumer advocate Ralph Nader, and Gene Roddenberry of "Star Trek" fame.

Art galleries in the new Fine Arts Center's phase one building, in the Library and at the Stony Brook Union offer continuing exhibitions of works by artists on and off campus. An average of five films are shown weekly on campus, including vintage and current productions; usually admission is free for students. The campus enjoys an average of one classical music concert per day including recitals, and faculty and visiting artist performances.

The University's Theatre Arts Department and several entirely student-run theatre groups have sponsored recent campus productions including "Small Craft Warnings" by Tennessee Williams, Mozart's comic opera "Cosi Fan Tutte," "Ah! Wilderness" by Eugene O'Neill, an outstanding campus student retranslation performance of Brecht's "Threepenny Opera," Samuel Beckett's "Waiting for Godot," and Kurt Vonnegut's "Welcome to the Monkey House."

Popular concerts recently on campus have included performances by Harry and Tom Chapin, Marshall Tucker, Charlie Daniels, Hot Tuna, New Riders of the Purple Sage, Elvin Jones, the Jefferson Starship, and Commander Cody and His Lost Planet Airmen.

Polity, the undergraduate student organization and its related groups, particularly the Student Activities Board, sponsor many campus activities. Polity presently funds more than 80 student interest clubs and organizations which in many cases complement students' academic work; organizations include the Aztec Society for students interested in Central and South American History, and French and Italian clubs. Other student activity clubs cover a broad range of interests. They include groups such as the Biological Sciences Society, the Chess Club, Inter-varsity Christian Fellowship, the Pre-Law Society and the Stony Brook Karate Club. Groups of 25 students or more interested in forming such organizations may apply for *Polity* funding.

The campus student newspaper *Statesman*, is published three times weekly during the academic year with a circulation of 10,000 on campus and in the local community, has won numerous collegiate journalism awards, and its writers receive favorable attention from potential newspaper employers and journalism schools through the practical experience which the publication offers. Other student publications include *Black World*, a newspaper published bi-weekly, focusing primarily on news of interest to the black community on campus; *Fortnight*, a feature magazine also published bi-weekly; *Soundings*, the literary magazine, and *Specula*, the campus yearbook.

Campus ministries serve student religious concerns through the new Interfaith Center offering regularly scheduled Jewish, Catholic, Lutheran and Episcopalian services which are open to all. Religious counseling services for students of these and other denominations also are provided through the Interfaith Center.

The International Club meets student interests in various cultural traditions, as do other groups including the Chinese Association, the Indian Student Association, the Pakistan Club, the African Students Association, the Latin American Organization, and the Caribbean Association.



Academic Programs

Undergraduate Programs

The undergraduate curriculum at Stony Brook is marked by increasingly flexible options in meeting degree requirements.

After the freshman year, during which a student may explore a variety of study areas and complete various university course requirements, most non-engineering students choose one of three degree programs leading to the Bachelor of Arts or Bachelor of Science degree. They may choose the traditional departmental major, an interdisciplinary or interdepartmental major or, broadest of all, a liberal arts major.

Programs leading to provisional certification in elementary and secondary education are also available.

Within the *College of Arts and Sciences*, students may select a departmental major in anthropology, applied mathematics and statistics, art, biochemistry, biological sciences, chemistry, computer science, earth and space sciences, economics, English, French, German, history, Italian, mathematics, music, philosophy, physics, political science, psychology, Russian, sociology, Spanish, or theatre arts.

The interdisciplinary or interdepartmental major allows a student to explore a broad study area through a coordinated program of courses given by several different departments. Existing programs are in Africana studies, comparative literature, elementary education, engineering chemistry, environmental studies, linguistics, religious studies, social sciences, and youth and community studies.

The liberal arts major is designed to lead to the baccalaureate degree by means of a study plan developed by the student in accordance with his or her individual interests. Faculty advisers help the student work out the plan. This degree program requires, after general University requirements are satisfied, completion of 60 credits in courses beyond the introductory level.

Within any of the three degree programs in the College of Arts and Sciences, a student may undertake independent study projects. This

option allows the student, in consultation with appropriate faculty members, to develop an individual course of academic investigation and study.

Two minor programs are newly available to students, Hispanic Bilingual-Bicultural Studies and the Program on Technology and Society. Other minors are being developed.

The *College of Engineering and Applied Sciences* with five departments—applied mathematics and statistics, computer science, electrical sciences, materials science and mechanics—grants the Bachelor of Science degree in applied mathematics and statistics or computer science, and the Bachelor of Engineering degree in engineering science or electrical engineering.

The undergraduate program in engineering has been designed to allow the student to follow any one of three paths: 1. conventional programs in electrical engineering, mechanics, or materials science and engineering; 2. programs specifically designed to prepare for work in certain newer fields such as ocean, urban, computer, or biomedical engineering; 3. programs of breadth appropriate for later specialization in medical, law or business school.

In order to realize these objectives, the engineering curriculum is much more flexible than at many engineering schools. Furthermore, there is strong emphasis on individual projects in the junior and senior years, when students are encouraged to work closely with members of the faculty on projects of interest to them.

Technology is now being asked nationally to provide help in far-reaching social problems: transportation, urban development, environmental improvement, health services and education. In parallel, engineers must contribute to the improvement of the quality of life in the developing nations. In all of these endeavors, the engineering problems are intimately related to the social, economic, and political aspects. Consequently, the engineering program at Stony Brook emphasizes the development of educational experiences in not only the engineering areas but also the underlying natural sciences, the related social and behavioral sciences, and the humanities.

Students with established career goals will profit by selecting a sequence of courses which provide organized preparation for a particular field of engineering. Through selection of electives, specialization may be obtained in the fields of electrical engineering, mechanics, and materials engineering as well as in interdisciplinary fields of ocean engineering, urban and policy science, computer science, applied mathematics and statistics, and biomedical engineering, or preparation for graduate studies in architecture, business, law, and medicine. Recommended sequences of courses in these fields are listed in the College of Engineering and Applied Sciences section of this *Bulletin*.

The *W. Averell Harriman College for Urban and Policy Sciences*, established in September 1975, is an extensive outgrowth of the graduate Program for Urban and Policy Sciences, established in 1971. Named for one of New York's most distinguished public servants, its

purpose is to train students for careers in public service primarily as analysts, planners, and managers. The curriculum and degree requirements are described in the *Graduate Bulletin*.

An accelerated curriculum experiment is in progress in which a student who has completed 60 credits and demonstrated aptitude for quantitative analysis and an interest in public service can earn the B.A. and M.S. degree in three years (a total of five undergraduate/graduate years). See page 296 of this *Bulletin* for course descriptions.

As part of the State University of New York, the University at Stony Brook is accredited by the Middle States Association of Colleges and Secondary Schools. The College of Engineering is accredited by the Engineers' Council for Professional Development. The Department of Chemistry is accredited by the American Chemical Society.

Brief information on undergraduate degree programs in the Health Sciences Center can be obtained from the Health Sciences Center section of this *Bulletin* (see page 343); more detailed information can be found in the separate *Health Sciences Center Bulletin*.

Facilities, Services And Activities

Student Affairs

The Office of Student Affairs, located in the Administration Building, is responsible for admissions, financial aids and records services, and for the support and direction of the programs described immediately below. The office also serves as a referral and information center for campus and community resources.

Residence Life

Residence life at Stony Brook is an integral part of the student's educational experience, offering opportunities for social, intellectual, and cultural development. Colleges are organized under a system of student self-government. Governance and activities patterns vary from college to college, but within each college students are encouraged to become involved in all aspects of residential life. Student governing and planning organizations also involve faculty and staff, some of whom live in the colleges. Nonresident students, both undergraduates and graduates, are invited to affiliate with a residential college. Professional counselors also live and work in the residence halls, and are available for consultation with students.

Each college houses students of different classes and varying academic interests. Both new and returning students have an opportunity to request assignment to a specific residential college. Requests from returning students, however, are honored on a priority basis. Undergraduates who are studying beyond their fourth year will be granted housing only if beds are available after entering freshmen have been housed.

The residential colleges, each housing from 200 to 400 students, are arranged in complexes called quadrangles, which normally accommodate a total of approximately 1000 students, representing both sexes and all classes. Each college accommodates students in double rooms or suites.

Each college has public lounges, study areas, laundry rooms and recreational facilities. Several residential quadrangles have operational dining halls. All resident freshmen will be required to participate in a Meal Plan unless otherwise notified.

Unmarried freshmen and incoming transfer students under the age of 21 are required to live in the residence halls *when there is space available*. Exceptions may be granted to commuting students living with a parent or legal guardian after a notarized letter to that effect is submitted to the Director of University Housing. An Off-Campus Housing Service is available to assist students in finding off-campus facilities.

For the 1975-76 academic year the University offered a limited number of housing units for married students. Priority was given to those couples of whom both were Stony Brook students; couples having other situations were housed on a space-available basis.

A commuting student center has also been established in the residence halls offering a study/meeting place for commuting students. The University will be able to offer the use of this facility again in the fall.

The *Residential Advisor staff* (currently four (4) in residence) responds to expressed student developmental, educational, and personal needs. The Residential Advisor staff holds office hours in the residential colleges. The staff also provides opportunities for informal contacts with resident and commuting students and cooperates with other resident staff in training student resident assistants.

The *Counselor in Residence staff* (currently ten (10) in residence) responds primarily to expressed student interpersonal and personal needs. Services are provided primarily through the University Mental Health Clinic with some staff housing office hours in the residential colleges. Response to personal emergencies on campus by the counseling staff is competent, local, immediate and supported by all University and extra-University services.

Information regarding the above Residence Life programs can be obtained by writing to:

Room 361
Administration Building
State University of New York at Stony Brook
Stony Brook, New York 11794

or by telephoning (516) 246-7006/7.

Student Services

The University Health Service, located in the Infirmary, primarily concerns itself with student health needs. It is available to faculty and staff only on an emergency basis. There is a registered nurse on duty in the Infirmary 24 hours a day. During the week there are scheduled hours for physicians; a physician is on call at other times. For information or help, call the Infirmary at 4-2273 (4-CARE).

The *Counseling Department* presently consists of the Mental Health Service (444-2281), located in the Infirmary Building, and the Psychological Center 246-6719), located in the Social Science A Building. Trained counselors offer both short term and longer term intervention for students experiencing psychological difficulties in adjusting to university life and its demands.

Career Development

The *Career Development Office* assists students and alumni with career-planning and provides information on full-time permanent employment. Individual and group consultation with students is emphasized while periodic critical self-examination assists students in relating academic expertise to future aspirations for seeking professional involvement and advancement.

An on-campus recruitment program permits interested seniors and graduate students to meet with prospective employers and graduate schools, and a Credential Service is provided to support students in their application for jobs and/or advanced study. These records are maintained permanently.

Students are encouraged to participate in the Student Volunteer Service Program (VITAL) in which experience in specific career areas is received by working with agencies and institutions seeking student volunteers.

Group discussions are held to assist seniors in writing resumes and to develop individual systems for applying for employment.

As part of the Career Development Office's Out-Reach Program, visits are made by the Career Counselors to residential areas to give students career-related information.

The Career Development Resource Library has information pertaining to the following: employment opportunities in business, government, social service, and education, career planning, teaching certification, health careers, graduate and professional school admissions testing, graduate school and financial aid information, and recruiting literature, such as the College Placement Annual (which describes major recruiting organizations actively seeking college graduates and individual company information).

It is suggested that students visit the office and become familiar with the services provided by the Career Development Office. The office, located in the Library Building, Room W-0550 (next to the Map Library), is open weekdays from 8:30 a.m. to 5:00 p.m. Its telephone number is (516) 246-7024.

Special Programs

The *Office of Special Programs* serves as the coordinator for ACTION (Peace Corps and Vista). Information and applications can be obtained in Humanities, Room 124.

The University has *Day Care Services* for children ranging in age from two months to five years. There are four facilities located on

campus and are professionally staffed with assistance from students enrolled in course work practica. Each of the four centers are different in that they specialize in a certain age group and curricula approach. The centers are open from 7:30 a.m. to 6:00 p.m. and fees are charged according to a sliding scale system.

The Office of Special Programs coordinates services to handicapped students and will assist them in application, admission and orientation procedures. The Office will also help in the following areas:

Housing (medical singles)

Meal (exemptions)

Medical (coordination with Director of University Health Services).

Recreation

Academic needs and progress

Special Parking Permits

Facilities

Financial

Transportation

Safety

Security

The academic admission requirements and procedures for disabled students are in general the same as for all other applicants. A disabled student, however, may apply under the 30% category as described in the general admission information. In addition, he must observe the following procedure:

1. Forward to the Director of Student Health Services (c/o the Admissions Office) a medical history sufficient to determine the functional capability of the applicant.

2. Arrange an on-campus interview with the admissions counselor responsible for the admission of disabled students.

3. Contact the Special Programs Office.

It is recommended strongly that prospective students who are disabled identify themselves prior to the proposed time of first enrollment. An early start will permit the evaluation of possible educational and physical problems and will provide time to work out solutions.

The *Office of International Student Affairs* is located in Humanities, Room 135. It assists students and faculty from other countries with problems related to finances, housing, government regulations (including immigration and tax matters), cross-cultural differences, and other general problems. Questions relating to academic problems are usually handled by academic advisors within the individual's school or department. The staff also works with community groups and student organizations to provide a varied program of activities during the year. Included are tours and trips, discussion groups, home hospitality, speaking engagements, and other events.

The *Office of Veterans Affairs*, located in Suite 125, Humanities Building, provides counseling for veterans and veterans' dependants eligible to receive educational benefits. These students are urged to contact that office concerning their eligibility as soon as possible.

Deferment of tuition is available to all eligible veterans and dependants. A War Service Scholarship and work/study position are also offered through the Office of Veterans Affairs.

A representative of the Veterans Administration is the staff member qualified to counsel and advise in other areas of concern to the veteran.

The *University Hearing Office* is located in the Humanities Building, Room 130. The responsibility of the Hearing Officer is to administer the University's Rules and Regulations and handle the disciplinary function in non-academic areas. His primary concern is maintaining a peaceful co-existence on the campus and an atmosphere conducive to learning. In those instances where a student may get into trouble at the University or have a social/behavioral complaint against another student, the case is most often referred to the University Hearing Officer. The Hearing Officer is available to mediate disputes as well as enforce campus policies regarding conduct.

In addition, the Hearing Officer coordinates the activities of the University's Court System and serves as a liaison between students and campus security. Copies of the University's Rules and Regulations can be obtained at his office.

Stony Brook Union

The *Stony Brook Union*, as a catalyst toward social, recreational and cultural interaction, is the center for community life on the University campus. It is a place where students, faculty and staff can gather together to initiate, plan or enjoy a variety of programs and activities.

The Stony Brook Union is governed by a governing board composed of students, faculty and staff. Membership on the governing board and its committees is open to all, residents and commuters alike. The governing board office is located on the second level of the Union in room 265. Interested persons are welcome to stop by with questions, comments or ideas, or to begin work with any of the governing board's sub-committee which are open to new membership.

The building provides many services and conveniences for the campus community. The dining facilities in the cafeteria include a snack bar, hot meals, Italian corner, grill and vending machines. The Buffetaria Dining Room is open for luncheon and dinner daily and for Sunday brunch. The "Knosh" delicatessen, located off the lobby on the main level, is open from 11 to 11 daily. Recreational facilities include a 12-lane bowling center, amusement game room and billiards area. Also included in the building are a bookstore, main desk information service, candy counter, newspaper and cigarette sales, post office, check cashing, haircutters, meeting rooms, lounges, ballroom, auditorium/theatre, reading room, undergraduate Polity, CED and graduate student government offices, WUSB radio station, "Statesman", student newspaper offices, women's center, ENACT environmental group, New York PIRG, as well as other student club and organization offices.

The Stony Brook Union Scheduling and Calendar Office provides central calendar information, registration and publicity for all campus events as well as assisting in making arrangements for use of building facilities, special set ups, equipment arrangements, and audio visual technical service. "News at Noon", an information sheet, published twice a week, is distributed by the Stony Brook Union.

In February, 1972, the Stony Brook Union Governing Board's Program Development Committee launched its first real programming effort. Since then, student program committees have initiated a weekly series of films, an informal concert series "Sunday Simpatico", Rainy Day Crafts weekly series, guest lecture noontime series, women's film series, India Night, Medieval Christmas celebration; musical programs including jazz, folk, eastern, rock, blue grass and barbershop sounds. Programs are created yearly by student committees in conjunction with the Program Development Committee of the Stony Brook Union Governing Board. New members and volunteers are constantly needed and welcomed to participate in the planning and execution of union programs. Students are encouraged to drop by Room 275 of the Union, weekdays, to talk about any ideas or interests which could be included in Union programs.

The Craft Shop offers non-credit informal out-of-classroom courses. Paid student and professional instructors have taught ceramics, pottery, silkscreening, macrame, leathercrafts, silver jewelry making, creative recycling, bicycle repair, woodworking crafts, Japanese brush painting, herbal arts and others. Other craft shop continuous activities include art gallery exhibits and receptions, pottery shop and photography/darkroom.

The Rainy Night Coffee House, a student run program, provides beverages, interesting edibles, pleasant social environment, films, music and campus talent daily and evenings.

The Recreation Committee has organized and directed tournaments for over 200 students and seeks representation to regional recreational tournaments.

The Stony Brook Union administrative and Faculty Student Association offices are located on the second floor of the Stony Brook Union.



Admission

Undergraduate Admission to the University

(College of Arts and Sciences, College of Engineering and Applied Sciences, W. Averell Harriman College for Urban and Policy Sciences)

A strong, broadly-based academic preparatory program is advised for all applicants to Stony Brook. A high school diploma (academic or college preparatory program), high school equivalency diploma, or an acceptable substitute is required. While the University does not actively seek students for early admission, such candidates are routinely evaluated and offered admission when admissions criteria are met. The University does require a letter from the secondary school supporting the student's application. Since Stony Brook receives many more applications than it has places available for new students, those applicants presenting the strongest preparation for advanced academic study normally will be more favorably considered. Students who intend to enter an engineering, mathematics, or science program are urged to take four years of high school mathematics, and a year of chemistry and physics whenever possible. The foregoing secondary school programs are strongly recommended rather than required, since it is felt that a student may develop a similar level of academic competence and intellectual facility in various ways, both within and outside the context of the classroom.

Recognizing that some students acquire academic and intellectual excellence outside their academic experience, the University is prepared to admit up to 30% of its first year applicants entering the Colleges of Arts and Sciences, and Engineering and Applied Sciences on the basis of high promise demonstrated by means other than the traditional academic criteria. Such criteria as creative ability in music, theatre, writing; special academic strength in such areas as mathematics, foreign languages, philosophy and Engineering as assessed by the appropriate academic departments; leadership potential; personal situations in which such factors as age, cultural background, family circumstances, among others, are considered; and exceptionally strong motivation will be taken into account. Applicants whose academic records have been adversely affected by a physical handicap may also apply in the 30% category. A supplementary admissions questionnaire is used to give candidates an opportunity to clarify their

high school records—their strengths and weaknesses. Counselor, teacher and student recommendations are employed to add depth and dimension to statistical data. Additional information which might help interpret or clarify an application is welcomed.

The information in this section on "Admissions" refers only to the Colleges of Arts and Sciences and Engineering and Applied Sciences. Students who seek admission to the W. Averell Harriman College for Urban and Policy Sciences should see the College's Director of Education, 314 old physics. There is no freshman admission. Students who seek admission to any of the undergraduate programs in the Health Sciences Center should consult the Health Sciences Center section in this *Bulletin* and the separate *Health Sciences Center Bulletin*. There are no freshman admissions to the baccalaureate programs in the Health Sciences Center; all undergraduate Health Sciences Center programs—with the exception of the Physician Associate certificate program—begin in the junior year. The section of the Health Sciences Center in this *Bulletin* and the separate *Health Sciences Center Bulletin* provides information on the application procedure for transfer students and for current Stony Brook students who are interested in being admitted to health sciences programs.

Advancement on Individual Merit (AIM) Program

The goal of the AIM Program is to provide access to higher education for New York State residents who otherwise would be unable to continue their schooling. Students who are admitted into the program must be educationally and economically disadvantaged according to Federal and State guidelines. AIM is an Educational Opportunity Program (EOP). It provides the financial and academic assistance that will enable educationally disadvantaged students who are not admissible by general academic criteria to complete an undergraduate program within five years—the first two semesters of which comprise the "Institutional Year." This period is devoted primarily to intensive remedial and counseling support. AIM students who perform satisfactorily on prescribed diagnostic tests are exempt from participation in the Institutional Year, and may thereby be eligible for graduation in four years rather than five. AIM applicants should understand that although notification occurs simultaneously, they are admitted first to the University and then to the AIM Program.

Applicants for AIM should contact their school guidance office, or AIM Admissions, State University of New York at Stony Brook, Stony Brook, N.Y. 11794 for detailed application and eligibility information. AIM applicants will be contacted for an interview after their applications are completed.

Application Procedures for New Freshmen

An application packet is available in your high school guidance office if you attend a secondary school in New York State; all other applicants write to: Admissions Office, State University of New York at

Stony Brook, Stony Brook, N.Y. 11794. The packet includes an Application For Admission to Undergraduate Study (hereinafter referred to as Application), with complete instructions and an envelope for mailing the Application. When the Application is received by the Admissions Office from the Application Processing Center (APC) in Albany, an additional form, the Supplementary Questionnaire (SQ) with full instructions will be sent to each applicant. Applicants completing the Supplementary Questionnaire are asked to return it to the Admissions Office within two weeks.

Applicants for the fall semester are strongly urged to file their application in time to be received in the Application Processing Center in Albany no later than January 5. Applications received by APC after January 5 will be considered on a rolling basis for the remaining vacancies, if any exist. It is the student's responsibility to insure that the completed application arrives at APC in Albany by January 5. It is also the student's responsibility to insure that all required supplemental materials are received at the Stony Brook Admissions Office by January 5 or within two weeks of the date subsequent to January 5 that the materials are mailed to the applicant. The University reserves the right to close fall application consideration at any time after January 5.

Applications for admission to the spring semester should be filed by October 15. Applications received after that date will be considered on a space available basis.

Examinations

Applicants (freshmen and transfers with less than 24 semester hours credit) from New York State high schools who have sat for the Regents Scholarship Examination (RSE), the CEEB Scholastic Aptitude Tests (SAT), or the American College Testing Program (ACT), are asked to submit the results to the Admissions Office along with an official high school transcript or copy of their General Equivalency Diploma.

Applicants planning to submit SAT or ACT scores are urged to take the test sufficiently in advance to insure that the scores are received by Stony Brook no later than January 5.

Applicants interested in the category of unusual academic strength in one or more areas under the creative admissions program are strongly urged to sit for the appropriate CEEB achievement tests and to request the scores be forwarded to the Admissions Office. Scores on these tests are an important factor in evaluating applications in this category.

Interviews

An interview is not required unless requested by the Admissions Office. Candidates may request interviews for purposes of information or clarification. Information from interviews may be used in the decision-making process. Discussions with counselors tend to be of greater usefulness after the complete application has been received in the Admissions Office. Group discussions led by trained undergraduate

students are also available and have proved very effective in explaining Stony Brook and in responding to student questions. In addition, student group leaders meet regularly with parents of applicants to discuss mutual concerns. Information regarding group discussions and individual interviews, as well as campus tours, may be obtained by mail or telephone from the Admissions Office: (area code 516 246-5126) from 9:00 a.m. to 4:30 p.m. Monday through Friday. It is best to telephone during the week to confirm weekend tour schedules. Student-led tours are conducted every Saturday and Sunday from 11 a.m. to 3 p.m. (except Thanksgiving, Christmas and Spring recesses) during the academic year.

Transfer Students

A. General Information

In order to obtain a baccalaureate degree from Stony Brook, transfer students, including part-time matriculated students, must attain a minimum cumulative grade point average of 2.0 based on completion of at least 36 credits earned at Stony Brook after achieving upper division status (57 credits).

Any applicant who has been registered previously (summer and part-time study included) at an educational institution since graduating from secondary school must apply as a transfer student. If no grades were earned, a statement of attendance and honorable dismissal is required. A grade point average of 2.5 (A=4.0) is usually the lowest base considered for admission. In addition to completing the application, transfer students must submit an official transcript from each post-secondary institution attended.

Applicants for the spring semester must file an application by October 15. Applicants for the fall semester are urged to file their applications by March 1. All applications received by the Application Processing Center in Albany by March 1 will receive first priority in consideration for admission. Applications received after March 1 will be reviewed on a rolling basis should any space still be available.

Transfer credit will be considered for all academic work satisfactorily completed (passing grade) at each prior institution. Students will be classified according to the following schedule of semester hours accepted for credit: freshman, 0-23; sophomore, 24-56; junior, 57-84; senior, 85 or more.

Following receipt of deposits, Course Evaluation Requests and Credit Evaluation Summary forms will be sent to the student to be completed for each course within the intended major. International students, or any applicant who has completed college-level study at another institution outside of the United States, must submit a Course Evaluation Form for each course taken. Courses will be evaluated by the department concerned for applicability to major requirements.

Transfer applicants who are seeking admission to one of the undergraduate programs in the Health Sciences Center should refer to the

Health Sciences Center section of this *Bulletin* and to information in the separate *Health Sciences Center Bulletin* for information eligibility and appropriate procedure for filing an application.

B. Two-Year College Graduates

The University is committed to offering admission to qualified graduates of university-parallel programs i.e., A.A., A.S. from community and agricultural and technical colleges within State University of New York. Such students will be given preference if the number of applicants necessitates establishment priorities. Graduates of career-oriented programs (A.A.S.) will be considered for admission on an individual basis and in competition with transfer applicants.

To facilitate students' transfer from Community Colleges to Stony Brook and to maximize the University's service to these applicants, Stony Brook strongly encourages two year college matriculants to file applications in the fall of their sophomore year for the following fall semester. (Applicants for admission to the spring semester are reminded that applications are not available until September and should be received by APC by October 15. Applications accepted for consideration after October 15, will be reviewed on a space available basis.) Earlier receipt of the completed application by the Admissions Office will make possible earlier decisions which in turn will improve services to students, e.g., enable more transfer students to participate in orientation and pre-registration, expand consideration for financial aid resources and provide transfer credit evaluation prior to academic advisement, among others. The University is prepared, therefore, to render decisions to two years college matriculants on the basis of two semesters of full-time work at the two year college since its offer of admission is conditional that the student's final transcript show award of the A.A. or A.S. degree. Individual class programs, however, will not be issued to students who pre-register nor will students who do not pre-register be permitted to complete final registration until final transcripts have been received in the Admissions Office.

Degree recipients of university-parallel programs at State University of New York community colleges or agricultural and technical colleges entering programs in the Arts and Sciences or Engineering College will receive full transfer credit for the completion of the freshman and sophomore years (including all general University requirements) which have applicability to academic programs at Stony Brook. Questions concerning the suitability of specific courses may be directed to the Admissions Committee via the Admissions Office. Transfer credits will be evaluated also for equivalency to Stony Brook courses or as general electives and applied toward the 120 credits required for graduation. Approved transfer credit will be entered on the official University transcript with the understanding that neither previous grades nor cumulative averages will be shown.

Part-Time Matriculation

A part-time matriculation program was established to provide educational opportunity for students to earn baccalaureate degrees who, for a variety of reasons, were unable to complete their degrees in a full-time status. Of special concern to the University were students working full-time, full-time Stony Brook students unable to continue in that status, and housewives whose duties prohibited full-time attendance. The program, however, is open to anyone who meets the general criteria for admission and for whom the University has a place. There is an extended day program offering evening classes leading to a bachelor's degree in the humanities or the social sciences which is available to part-time matriculated students.

The University will consider applications only from students who have earned a minimum of 57 transferable credits. A grade point average of 2.5 (A=4) is usually the lowest base considered for admission. Students admitted as part-time matriculants must carry a minimum academic load of 4 credits but may not carry more than 11. Part-time matriculated students are subject to all academic rules and regulations appropriate to that status.

Students interested in part-time matriculation who have never matriculated at Stony Brook must follow application procedures described elsewhere in this section for transfer students. Former Stony Brook students and those currently attending must contact the Admissions Office for additional information and instructions for filing an application. Continuing matriculated students who desire to change their status from full-time to part-time or part-time to full-time must file an application available in the Admissions Office not later than the final day of late registration. A full-time student who registers for eleven or less credits without authorization will be charged tuition as a full-time student.

Handicapped Students

The academic admission requirements and procedures for disabled students are in general the same as for all other applicants. A disabled student, however, may apply also under the 30% category as described in the general admission information. In addition, he must observe the following procedure:

1. Forward to the Director of the Student Health Services a medical history sufficient to determine the functional capability of the applicant.
2. Arrange an on-campus interview with an admissions counselor. It is recommended strongly that prospective students who are disabled identify themselves at least a year in advance of the proposed time of first enrollment. An early start will permit the evaluation of possible educational and physical problems and, also, provide time to work out solutions.

International Students

The University admits a limited number of international students each year in the fall. Please write the Admissions Office for the preliminary application materials and information.

Notification of Admission

It is anticipated that transfer decisions for fall will be mailed beginning February 15. It is expected that freshman decisions will be mailed in early March. All offers of admission are conditional subject to receipt of official records showing successful completion of academic work in progress. A significant drop in grades will necessitate a review of the application and may result in withdrawal of the offer of admission. To insure maximum opportunity for resolving difficulties that may arise when an admitted transfer student's index for the semester immediately preceding registration falls below 2.5 (A=4), the student is advised to contact an admissions counselor as soon as possible.

In all cases it is the student's responsibility to see that a final high school or college transcript is sent to the Admissions Office. For new freshmen this includes certification of graduation from high school. Community college applicants who expect to be degree recipients (A.A., A.S., or A.A.S. in Engineering Science) must present evidence of receipt of the degree prior to enrollment. Also, ALL transfer students must present a final transcript to the Stony Brook Admissions Office PRIOR to final registration. Requirements for an authorization to register and completion of registration, including a medical report and payment of necessary deposits are explained with the offer of admission.

Deferred Enrollment

Consistent with the policy that permits admission of students who acquire academic and intellectual excellence outside the formal classroom experience, the University recognizes the desirability of permitting a limited number of admitted freshmen to defer enrollment for one year. It is expected that students granted deferred enrollment will use the opportunity to travel, to work, to perform service or otherwise enrich their life experience through activities exclusive of formal academic endeavor within the United States. The student granted deferred enrollment who subsequently presents a transcript for transfer of credits earned at an institution within the United States during the year of his absence voids the University's responsibility to reserve a place for him at the time of his return. His status also changes to a transfer student who would then have to file a new application in competition with all other transfer applicants. Completion of course work in institutions of higher learning outside the United States, while acceptable in the spirit of this policy, would be considered more valuable when used as a supplement to a variety of other non-classroom activities.

Up to 50 freshmen may be granted deferred enrollment in a single academic year. Since it is the student's responsibility to return to the University the September following completion of the year of deferred enrollment, the University's obligation to reserve a place for the student terminates at that time. A student thus losing his or her place would have to file a new application for subsequent consideration.

Instructions for submitting an application for deferred enrollment are mailed with the offer of admission. Applications must be received in the Admissions Office by May 1. Decisions will be rendered by June 1 to all who requested consideration. Students offered admission after May 1 may be considered for deferred enrollment should any spaces still be available.

Advanced Placement

Advanced placement may be extended to freshman students who have completed advanced placement courses in secondary school, or who have demonstrated in other ways academic competencies which may entitle them to a waiver of certain course requirements. Advanced placement may also be accompanied by semester hour credit toward graduation. Candidates undertaking advanced placement courses in secondary school must take the appropriate CEEB Advanced Placement Examination and request that their scores be forwarded to Stony Brook. While each department determines the minimum test score which is required for advanced placement or for granting semester hour credit, a score of 4 is usually the minimum acceptable. Others desiring advanced placement must submit written requests for reviews of their qualifications; in most cases special qualifications will be required.

Challenge Program for Advanced Credit

The University has established a Challenge Program which permits undergraduates to earn advanced placement and semester hour credit by taking examinations in place of regular courses. Each department determines the courses for which it will offer challenge examinations. No student may take a challenge examination in a course which is a prerequisite for a course already passed. The maximum number of courses in which a student can accumulate challenge credit (including credit from advanced placement examinations) is five.

Students seeking further information about the Challenge Program should consult the program guidelines which are available in the academic departments in the Office of Undergraduate Studies.

Preadmission Deposit and Refund Policy

Each new student is required to pay an advance tuition deposit of \$50 and, when housing is requested, an additional \$75 deposit. Fall deposits are due May 1 or 30 days after admission is offered, which-

ever is later, and are applied against charges incurred by the student in the first semester. Spring deposits are due 30 days after admission is offered. Requests for refunds should be sent to Student Accounts, SUNY at Stony Brook, Stony Brook, New York 11794, and should be received by the University not later than the expiration of the due date. To insure timeliness and receipt of the deposit refund request, the University suggests letters be sent certified mail, receipt requested.

Part-Time Non-Matriculated Students

A. Eligibility and Conditions

Students may enroll each semester as Part-time Non-matriculated (PTNM) undergraduates. High school students who have completed their junior year, high school graduates and individuals who have received a bachelor's degree are eligible to apply, provided they wish to take only undergraduate courses. In general, three factors will determine admission as a PTNM student: 1) quality of previous academic work, if any, and/or potential to complete academic work satisfactorily at Stony Brook; 2) number of places available; and 3) student's need for PTNM status.

Students accepted into this program are admitted for one semester only and normally may take up to eleven credits of work. Students who feel it is necessary for them to carry more than eleven credits in a non-matriculated status should consult an admissions counselor. PTNM students currently in attendance who advance register for more than eleven credits without authorization will not be issued their individual class schedules for the next semester. Students whose class schedules are so withheld must consult with an admissions counselor for adjustment of their academic programs.

PTNM students choose from among regularly scheduled classes and register as space permits.

Students desiring to continue in a PTNM status an additional semester are required to complete, sign and return by the end of the current semester, a Continuation Form that will be mailed to them during the tenth week. Applicants will be notified of the University's decision on their request to continue as a PTNM student two weeks following the end of the current semester or as soon thereafter as final grades are available.

PTNM students cannot be graduated from the University in that status. Courses and grades earned as a part-time non-matriculated student may be applied to a degree program at Stony Brook should the student subsequently matriculate. A transcript may also be secured from the Registrar if a part-time non-matriculated student later applies to another college and wishes to petition that college for acceptance of transfer credit for courses satisfactorily completed at Stony Brook. Attendance as a part-time non-matriculated student does not necessarily accrue special consideration for admission subsequently as a matriculated student. Students interested in PTNM status are urged to

file an application before the end of the semester preceding the one for which they are applying. Forms are available only in the Admissions Office.

B. Change of Status

Part-time non-matriculated students who wish to apply for matriculation may secure the appropriate forms in the Admissions Office. Currently matriculated students who wish to change to a part-time non-matriculated status for a semester may apply for a leave of absence from matriculation, complete a PTNM application and arrange for an interview with an admissions counselor.

Continuing students who wish to complete degree requirements as part-time non-matriculants must follow the above schedule and also secure a residency waiver from the Committee on Academic Standing. Students in this situation should also consider continuing as part-time matriculants, described earlier in this section of the *Bulletin*. Applications and additional information are available in the Admissions Office.

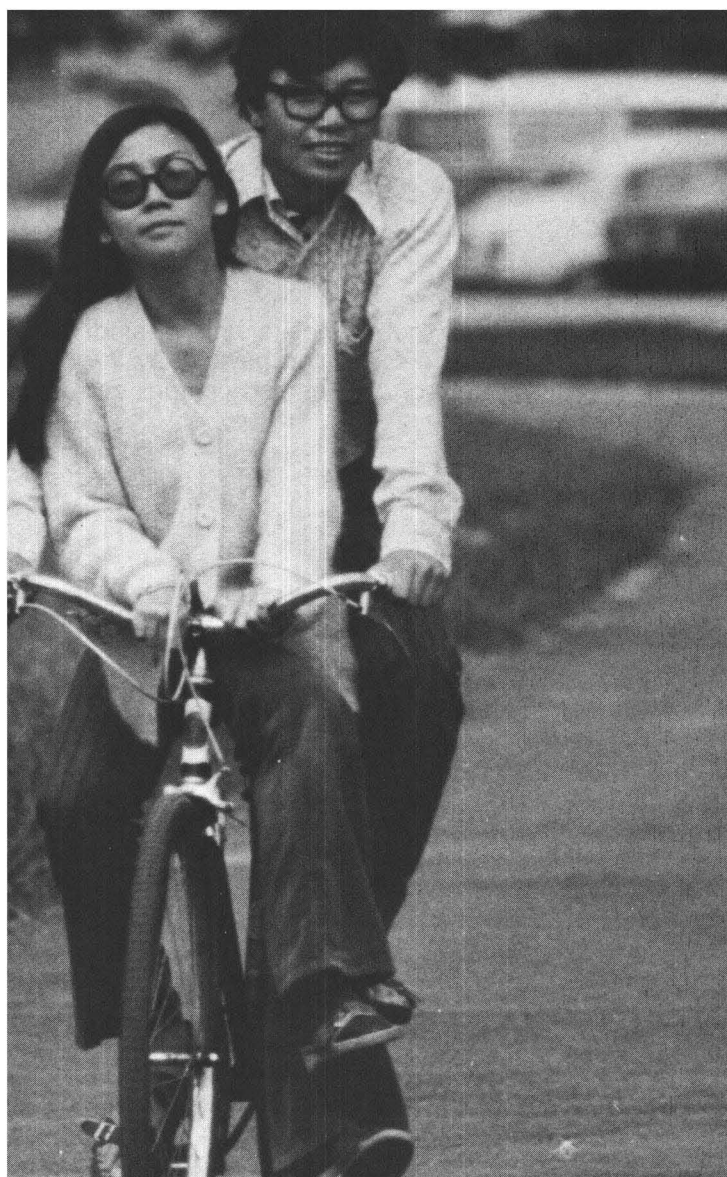
Orientation Program

Orientation for the freshman year is conducted during June and July. Orientation is concerned with academic advisement, registration, and helping students adapt to university life. Attendance is strongly recommended.

Students unable to attend the Summer Orientation Program will be registered just prior to commencement of classes in September. An orientation program is also available for transfer students. Information is usually sent at the time of or subsequent to the offer of admission.

Withdrawal, Readmission, Leave of Absence, Visiting Student Program

Information concerning withdrawal, readmission or leave of absence from the University is presented on page 66. The Visiting Student Program is described on page 65.



Registration is not complete until a student has paid all fees and charges which are due and payable by the first day of classes unless properly deferred. All fees and charges are subject to change without notice.

	<i>First Semester</i>	<i>Second Semester</i>	<i>Year</i>
Charge or Fee			
Tuition			
<i>Undergraduates:</i>			
N.Y. State resident— Lower Division	\$ 375.00	\$ 375.00	\$ 750.00
N.Y. State resident— Upper Division	450.00	450.00	900.00
Non-resident— Lower Division	600.00	600.00	1,200.00
Non-resident— Upper Division	750.00	750.00	1,500.00
<i>Graduates:</i>			
N.Y. State resident	700.00	700.00	1,400.00
Non-resident	900.00	900.00	1,800.00
<i>Professionals (medicine and dental medicine):</i>			
N.Y. State resident	1,100.00	1,100.00	2,200.00
Non-resident	1,600.00	1,600.00	3,200.00
<i>Part-time Undergraduates (Less than 12 credits—12 credits or more is Full-time)</i>			
(Charge per semester credit hour)			
N.Y. State resident— Lower Division	21.50	21.50	

	<i>First Semester</i>	<i>Second Semester</i>	<i>Year</i>
N.Y. State resident—			
Upper Division	26.75	26.75	
Non-resident—			
Lower Division	35.75	35.75	
Non-resident—			
Upper Division	43.50	43.50	
<i>Part-time Graduates:</i>			
(Charge per semester credit hour)			
N.Y. State resident	40.00	40.00	
Non-resident	50.00	50.00	
<i>College Fee</i>			
Full-time student (12 credits or more)	12.50	12.50	25.00
Part-time student85	.85	
(per semester credit hours for less than 12 credits)			
^a Housing—double occupancy	375.00	375.00	750.00
Meal Plan	To Be Announced		
Cooking Fee (on-campus resident not on meal plan)	25.00	25.00	50.00
^b Student Activity Fee			
(Undergraduate Full-time)	35.00	35.00	70.00
Lost Identification Card	3.00		
^c Orientation (optional)			
Freshmen	2 days	36.00	
	3 days	46.00	
	4 days	50.00	
Transfer Students	1 day	11.00	
	2 days	44.00	
Returned Check Fee	5.00		
Late Registration Fee	20.00		
Late Payment Fee	20.00		
^d Advance Tuition Deposit			
(Freshmen and transfers only)....	50.00		
^d Advance Housing Deposit			
Transcript Fee (one at no charge)	75.00	2.00 each	

^a Mandatory for Freshmen.

^b This fee set by Polity (Undergraduate Student Government).

^c Includes orientation fees and charges for room and board.

^d Applies toward first semester charges.

Payment of Fees and Charges

All fees and charges for a given academic session must be paid in full or properly deferred prior to the first day of classes. All checks must be payable to "SUNY at Stony Brook". Post dated checks are not accepted.

Students making payment on or after the first day of classes, during the late registration period, or pre-registered students making payment after pre-billing due date, shall be required to pay a late registration fee of \$20.00. This fee may not be waived, and is non-deferrable. The late registration period ends at the close of the second week of classes.

Deferment

Students receiving awards provided by the State of New York, managed by the University, or payable to the University, may utilize deferment equal to the amount of the award. Documented proof of the award and the amount must be presented at time of payment to apply the deferment to the account.

Deferment may be granted to students for the following types of awards:

1. *Regents College Scholarships and Regents Tuition Assistance Awards:* All New York State residents are encouraged to file for Regents Tuition Assistance Awards. Incoming students and students who have not received their application form by June 11 should immediately obtain the application form from the Financial Aid Office. (Students should apply for all Regents Awards at the earliest possible date, preferably no later than June 10, if they expect to receive award certification from the Regents prior to the beginning of classes in the fall. Students are reminded that failure to file an application in a timely manner can preclude their receiving award credit or deferment.)

When paying bills students should present a notarized Power of Attorney card and award certification to the Bursar's Office to be eligible for an award credit. Students who have not received a Regents award notice may obtain a deferment upon presentation to the Financial Aid Office of the stub from the Regents Scholarship and/or Tuition Assistance Award Notice from the previous year, and the certified return receipt from the Regents Scholarship Examination Center indicating submission of the current year's application.

2. *National Direct Student Loan, SEOG/EOP:* Students who have filed applications prior to the specified deadlines and who qualify for awards receive award letters from the Financial Aid Office by mid-June. Acceptance of these awards must be returned to the Financial Aid Office promptly. Deferment will be granted upon presentation of the award letter to the Bursar's Office.

3. *Basic Educational Opportunity Grant:* Students will receive an award notice (Student Eligibility Report) from the federal government. This notice must be submitted to the Financial Aid Office for approval

and processing. The approved student copy of the Student Eligibility Report must be submitted to the Bursar's Office to complete deferment.

4. *Veterans' Education Benefits*: Students who are eligible for veterans' benefits should obtain an application from the Veterans' Office. Incoming students who are veterans are advised to contact the Veterans' Office concerning veterans' benefits as soon as possible.

The 1972 G.I. Bill amendments provide for advance payment of up to two months of G.I. benefits to be available for the veterans upon registration, but in no case earlier than 30 days prior to the beginning of the enrollment period. The advance payment check will be mailed directly to the University and held there for the veteran. Veterans will be notified directly by the Veterans Administration.

Deferment based upon Veterans' benefits may be obtained by submitting to the Bursar's Office a copy of the Deferment Form prepared and signed by the Stony Brook Office of Veteran Affairs. For veterans whose educational benefits are paid directly to the University, present an Eligibility Award Certificate from the Veterans Administration to the Bursar's Office.

5. *Office of Vocational Rehabilitation*: Deferment based upon Office of Vocational Rehabilitation benefits may be obtained by presentation of an award letter indicating the amount of the award and period covered from the Office of Vocational Rehabilitation. All such letters must be accompanied by a Tuition Assistance Award Certificate, if applicable.

6. *Private, Public, or Industrial Scholarships, Grants, Internships and Loans* (including Foreign Student Government Scholarships and Vocational Rehabilitation Grants): All students who can present notification of awards payable to the University or jointly payable to the University and the student in the above categories are eligible for an award credit equal to the amount of the award. In cases where the award is payable to the student or to the University and the student, the student will be required to complete notarized power of attorney form to be presented at the Bursar's Office in order to receive an award credit.

7. *Hardship Deferments*: Students experiencing severe financial hardship based on extraordinary personal circumstances may request deferment of financial charges for only tuition, room and board. Such requests should be made in the Student Affairs Office (third floor Administration Building) before registration. Full documentation will be required. Failure to submit an application for awards or financial assistance for which a student is eligible will not be accepted as a basis for a hardship deferment.

8. *New York Higher Education Assistance Corporation Loan (NYHEAC)*—Once a student has received the approval from NYHEAC and the promissory note from the bank, a deferment will be granted when these forms are submitted to the Financial Aid Office. A deferment letter issued by the Financial Aids Office must then be submitted to the Bursar's Office.

Students with financial hardship may be eligible for short term bank loans at low interest rates. Eligibility for such loans is determined by the Financial Aid Office.

Refund Schedule

All requests for refund of Tuition, Room, Cooking fee, and Activity fee, must be made in writing to the Office of Student Accounts, Room 254, Administration Building. College fee, late registration fee and lost ID card fee are non-refundable. The first day of class session shall be considered the first day of the semester, quarter, or other term and Saturday of the week in which this first class session occurs shall be deemed the end of the first week for refund purposes.

Tuition

A student who withdraws from the University shall be liable for payment of tuition in accordance with the following schedule:

	Semester	(Six Week Term) Summer Session
1st Week	0%	0%
2nd Week	30%	70%
3rd Week	50%	100%
4th Week	70%	
5th Week	100%	

(Due to the fact that campus offices are not open for business on Saturday, cancellations and withdrawals must be effected during the Monday through Friday office working hours)

NOTE: It is interpreted that a student who does not attend any class sessions after Saturday of the first week and who notifies the college of any intent to cancel registration on or before the second Saturday following the first day of classes shall be deemed to have cancelled registration during the first week.

Certification of the effective date of withdrawal must be made by the Office of Records and Studies (Registrar). A withdrawal card which is obtainable at the Registrar must be completed and returned to that office on the date you withdraw. To expedite your refund, the Student Accounts copy of the withdrawal card should be submitted with your refund request.

No money shall be refunded unless application for refund is made within one year after the end of the term for which the tuition requested to be refunded was paid to State University.

Exception

There shall be no tuition or fee liability established for a student who withdraws to enter military service prior to the end of an academic

term for those courses in which he does not receive academic credit. Proof must be submitted.

Room and Cooking Fee

Once a student has registered and occupied a room, no refund will be granted for room payment made for that *quarter* and no refund for the *semester* cooking fee. Refund requests for room must be accompanied by verification of the move-out date by the University Housing Office.

Student Activity Fee

As determined by Polity (Undergraduate Student Government) and the CED Student Government, full refunds will be granted if the student withdraws within the first two weeks of classes. No refund will be granted for withdrawals after the second week of classes.

Meal Plan

Meal Plan refund request must be made in writing to the Faculty Student Association, Stony Brook Union.

Advance Tuition Deposit

Request for refund will be granted under the following conditions:

If a student is admitted prior to April 1, the written request for refund must be received in the Admissions Office by May 1. Those admitted after April must submit their written request for refund to the Admissions Office within 30 days.

Advance Housing Deposit

Request for refund will be granted if application is made in writing before July 1.

Summer Session

Summer Session charges are as follows:

Tuition

Undergraduate (N.Y. State Resident)	
Lower Division	\$21.50 per cr. hr.
Undergraduate (N.Y. State Resident)	
Upper Division	26.75 per cr. hr.
Undergraduates (Out-of-State Resident)	
Lower Division	35.75 per cr. hr.

Undergraduates (Out-of-State Resident)	
Upper Division	43.50 per cr. hr.
Graduate and CED Students (N.Y. State Resident)	40.00 per cr. hr.
Graduate and CED Students (Out-of-State Resident)	50.00 per cr. hr.
Physical Education Courses	22.50 (most courses)

Fees

Room, double occupancy	\$14.00 per week
College Fee85 per cr. hr.
Student Service Fee	5.00
Late Registration Fee	15.00

For further information please see the *Summer Session Bulletin*.

Financial Aids

The Financial Aid Office administers several federal and state funds which are provided to assist "needy" students in pursuing their academic goals. The basic application for these funds is the *Parents' Confidential Statement* or the *Student's Financial Statement*. These forms plus any additional forms necessary are available from the Financial Aid Office. The application deadline for continuing Stony Brook students is February 28 of each year. The application deadline for new students (Freshmen and Transfers) is April 1 of each year. The programs administered by the Financial Aid Office are: National Direct Student Loan (NDSL), Supplemental Educational Opportunity Grant (SEOG), College Work Study Program (CWSP), and the New York Higher Education Assistance Corporation Loan (NYHEAC). For further information call the Financial Aid Office at (516) 246-7010 or 7013.



General Academic Information

Semester Registration

Completion of registration each semester in accordance with instructions issued by the Registrar (Office of Records) is a prerequisite to class attendance. Although the Registrar will attempt to send individual instructions to every eligible student in advance of each registration period, changes in status and addresses make it impossible for him to guarantee that every student will automatically receive these instructions. Eligible students who fail to receive final registration information by August 15 for the fall semester, or December 31 for the spring semester should contact the Office of Records without delay.

Registration after the close of the announced final registration period in the academic calendar requires the payment of a service charge of \$20. Registration is not permitted after the end of the second week of classes. *A student is not considered registered until the appropriate forms have been filed with the Office of Records and payment or proof of proper deferment of tuition and fees has been made to the Bursar's Office prior to the first day of classes or by the end of the late registration period.*

Course Registration

With the assistance of an academic advisor each student selects a program of courses, and it is the student's responsibility that the program conforms with academic regulations and meets degree requirements. Normally, a student will complete a preliminary registration, including a selection of courses, before the beginning of a semester.

Change in Course Registration

During the first two weeks of classes a student may, within the regulations, add or drop courses by submitting the appropriate form to the Office of Records. No record is made of courses dropped before the end of the second week. After that date, a course may be added only

Please see the chapter on the Health Sciences Center in this *Bulletin* and the *Health Sciences Center Bulletin* for information relating to the Health Sciences Center.

with the approval of the Committee on Academic Standing (See page 60 "Committee on Academic Standing") or the Undergraduate Academic Affairs Committee (See page 60 "Undergraduate Academic Affairs Committee"), or the College of Arts and Sciences and College of Engineering and Applied Sciences, respectively.

From the third through the fifth week, a course may, within the regulations, be dropped (See page 55 "Course Load" and page 57 "Grading System"). After the fifth week, a student may withdraw from a course only by withdrawing from the University by the last day of classes, or, in exceptional circumstances, by the approval of the Committee on Academic Standing or the Undergraduate Academic Affairs Committee.

See Academic Calendar, page 8, for specific deadline dates.

Auditing

Auditing refers to the practice of attending a course for informational instruction only. No credit is granted for such work nor does the University keep any record of the student's participation in the course. The privilege of auditing courses is reserved for regularly enrolled students only.

A student who wishes to audit a course must first obtain the permission of the instructor. No petitions to change from audit to credit status will be allowed after the second week of classes.

Course Load

A normal course load for full-time matriculated students is a program totaling 12 to 19 semester hours. Any other program requires approval by the Committee on Academic Standing or the Undergraduate Academic Affairs Committee. Before the beginning of classes, no student may register for more than 19 semester hours. Requests for permission to register for more than 19 hours should be submitted through the Office of Records during the first two weeks of classes. Requests for approval of a *less* than 12-hour program should accompany any registration or change of registration which includes such an underload.

Since a student is classified as full time only if he or she is registered for 12 or more semester hours, before requesting an underload a student should determine the consequences, particularly in terms of scholarships and loans.

Academic Advising

The Undergraduate Studies Office, located in the Library Building, has overall responsibility for the academic advising of all new students until such time as they officially select a major. Designated faculty from each academic department and program are also available to advise students. Prior to their first registration at the University all new students are invited to participate in an orientation program during which they receive academic information and advice from faculty, pro-

fessional staff and student orientation leaders. Students who have not yet selected a major are expected to consult advisors in the Undergraduate Studies Office and in the departments for assistance in planning their academic programs. Students who have selected a major department are expected to receive assistance in academic planning from that department.

Selection of Major, Change of Major, Addition of a Second Major

All freshmen enter the University under the General University Program (GEN) and are not expected to select a major officially until they have had an opportunity to test various academic interests by taking college level courses in those fields. Most students officially designate a major during their sophomore year, using the Selection-of-Major form available from the Office of Records.

In order to change officially from one academic major program to another, students should discuss the change with appropriate advisors and secure their signatures on a Change-of-Major form available from and returned to the Office of Records.

Students who wish to add a second major (double major) must obtain the approval of the Undergraduate Studies Office.

Students who wish to enter one of the upper-division programs in the Health Sciences Center must apply for admission to that program and be formally accepted in the spring of their sophomore year. Admission to any of the Health Sciences Center programs is *not* accomplished through the change of majors mechanism.

Two Baccalaureate Degrees

Qualified students whose special interests and career plans make such study appropriate may be granted permission to earn two degrees at the undergraduate level by planning a program which leads to a Bachelor of Engineering degree from the College of Engineering and Applied Sciences and a Bachelor of Arts or a Bachelor of Science degree from the College of Arts and Sciences. Written approval to undertake this curriculum must be obtained from the dean of the College of Engineering and the Undergraduate Studies Office subject to review and final authorization by the academic vice president. In addition to meeting all general University requirements, the candidate for two degrees must earn a total of 144 credits and must fulfill the requirements of the undergraduate program in engineering science in the College of Engineering and Applied Sciences and the requirements of an established degree program in the College of Arts and Sciences.

Health Professions Office

Stony Brook students interested in preparing for medicine, dentistry, or one of the other health professions should register with the Health

Professions Office as early as possible. The competition for admission to professional schools is intense. Applications must be prepared a year or more in advance. This means that prospective applicants must begin working on the professional school requirements early in their academic careers. The Health Professions Office must prepare an official evaluation for each applicant to professional school, and this too requires advance planning. The earlier a student registers with the Health Professions Office and follows the recommendations given him, the better the chances of entering a health profession. Registration with the Health Professions Office does not commit a student to any particular academic program or future career.

Grading System

Unless the description of a particular course provides otherwise, a final grade is assigned each semester for every course or independent study project in which a student is registered after the second week of classes.

A student who withdraws from a course after the second week and before the sixth week of the semester is assigned one of the two following grades: WP, indicating withdrawal while passing or before evaluation; WF, indicating withdrawal while failing. Grades of WP or WF will be converted to NC if the student has elected the Pass/No Credit grading option for the course or courses from which he has withdrawn.

Unless a student receives a withdrawal grade in a course, he or she is assigned one of the following final grades:

- A—indicates superior work
- B—indicates good work
- C—indicates satisfactory work
- D—indicates minimum passing work
- F—indicates failing work
- R—indicates registration in a year-long course for which the final grade will be assigned only after the completion of two semesters

At his or her discretion, an instructor or supervisor may assign the following temporary mark: I (Incomplete) which indicates inability to complete all course requirements because of circumstances beyond the student's control. The instructor will set a date for completion no later than November 1 for courses in the preceding spring semester or summer session and no later than March 15 for courses in the preceding fall semester. In unusual circumstances, an instructor may extend the completion date beyond these limits by written notification to the Registrar. If the final grade is not reported by the applicable normal or extended deadline date, the grade "F" is assigned.

An instructor may assign a temporary grade of NR (No Record) only

for students who have never, to the instructor's knowledge, participated in the course in any way. An NR report is not to be interpreted as a grade but only as a temporary indication of a state of affairs which requires prompt resolution, leading either to removal of the course from a student's program (whenever it turns out to have appeared as a result of an error in recording the registration information submitted by the student), or to the assignment of a grade. If a final grade is not reported by the deadline date appearing in the Academic Calendar, the grade of F or NC, as appropriate, will be recorded.

Grades appearing on a student's academic record at the time of his or her graduation cannot be changed to any other grade subsequent to the graduation date. No student will be permitted to graduate with the grade of "I" or "NR" on his or her academic record. Degree candidates wishing to make up incomplete work must file an application to postpone their graduation until the end of the following term. The deadlines for such applications are the same as the deadlines for initial degree applications as stated in the academic calendar.

Pass/No Credit Academic Record Option

With the possible exception of courses in the major program, a student may elect to have the final grade in any course recorded on the official academic record either as P (Pass) if the reported grade is A, B, C, or D or as NC (No Credit) if the reported grade is WP, WF, or F. The following provisions reflect the intent of this option, which is to permit exploration of less familiar areas of study without weakening standards of evaluation or masking a record of poor performance.

A. Election of the P/NC option is limited to the first five weeks of each semester. After the specified date as shown in the Academic Calendar, no changes either to or from the P/NC option may be made.

B. The Office of Records does not communicate to the instructor in a course the names of students who elected the P/NC option.

C. The requirements for a major program may make the P/NC option unavailable in a course used to meet requirements for that major. Specific information may be obtained from the department or other agency which supervises the program.

A student who intends to enter a professional or graduate school program may be advised not to elect the P/NC option in certain courses or fields of study. The appropriate advisor should be consulted.

S/U Grading

The Curriculum Committees of the College of Arts and Sciences and of the College of Engineering and Applied Sciences have the authority to approve the offering of certain courses on a Satisfactory/Unsatisfactory grading basis, where finer grading distinctions are impractical. The only grades given in such courses will be S and U. The grading policy for each such course is to be announced in the description

of the course in the *Undergraduate Bulletin*. For purposes of determining academic standing, the S/U grade shall be equivalent to P/NC. Students may not elect to take such a course for P/NC.

Grade Point Average

For the purpose of determining the grade point average specified in degree requirements, grades are assigned point values as follows: A = 4, B = 3, C = 2, D = 1, F = 0. Other grades do not enter into the grade point average, nor do course credits transferred from other institutions. For a collection of courses with quantitative grade values as shown above, the grade point average is found by multiplying the number of credit hours for each course by the point value of the grade assigned, adding the results, and then dividing by the sum of the credit hours for all of the courses.

Semester Grade Reports

Grade reports are prepared as quickly as possible after the conclusion of each semester. Consistent with the University's efforts to encourage mature and responsible behavior in all aspects of a student's development, it is felt appropriate to place upon the student the responsibility for communicating information regarding academic program and progress to parents. Accordingly, grade reports are addressed to the student at the end of each semester.

Repeating Courses

Students may register again in a course for which they have already received a grade recorded as D, WP, WF, NC, or F. In such cases each grade is recorded and computed separately except that the credit hours earned in a given course may be counted only once toward the quantitative credit-hour degree requirements (120 semester hours for the B.A. and the B.S.).

Class Status

As used in academic regulations and degree requirements, class designations are based on the following schedule of credits earned: freshman, 0-23; sophomore, 24-56; junior, 57-84; senior, 85 or more.

Academic Standing

Minimal acceptable academic progress is established in terms of the rate at which course credit is earned. The number of credit hours earned in a semester is the total number of credit hours assigned to courses with recorded grades of A, B, C, D, or P (degree requirements specify, however, that a cumulative grade point average of at least

2.00 is required for all work undertaken after entrance into the junior year, 57 earned credit hours). A student who fails to make satisfactory progress will be placed on academic probation or dismissed according to the following provisions:

A. A student who, in any given semester is classified as a freshman (0-23 earned credit hours) and who, in that semester and the preceding semester, earns a total of at least 16 but not more than 20 hours of credit is regarded as being on PROBATION in the succeeding semester.

B. A student other than a freshman (one who has earned 24 or more credit hours) who, in that semester and the preceding semester, earns a total of at least 18 but not more than 23 hours of credit is regarded as being on PROBATION in the succeeding semester.

C. A student who, in any given semester, is classified as a freshman (0-23 earned hours) and who, in that semester and the preceding semester earns a total of fewer than 16 hours of credit will be DISMISSED.

D. A student other than a freshman (one who has earned 24 or more credit hours) who, in that semester and the preceding semester, earns a total of fewer than 18 hours of credit will be DISMISSED.

E. A student who would otherwise be on probation for a third successive semester will be DISMISSED.

Part-time students are exempt from the above regulations. A part-time student who has attempted at least 24 credits while in that status and has earned credits totaling less than two-thirds of the number attempted may be dismissed or placed on probation under terms set by the Committee on Academic Standing.

In the case of students who have been dismissed for academic reasons, at least one semester must elapse before they will be considered for readmission. A student who has been dismissed twice is not eligible for readmission.

Committee on Academic Standing for College of Arts and Sciences Students

Exceptions to regulations regarding such matters as registration changes, course loads and academic standing may be made by the Committee on Academic Standing, which operates under faculty legislation. Information about academic regulations or CAS policies and advice about individual requests to the Committee may be obtained from the Undergraduate Studies Office.

Engineering and Applied Sciences students should direct their requests to the Undergraduate Academic Affairs Committee.

Undergraduate Academic Affairs Committee for College of Engineering and Applied Sciences Students

The Undergraduate Academic Affairs Committee in the College of Engi-

neering and Applied Sciences considers petitions for exceptions to regulations regarding such matters as registration changes, course loads and academic standing. In addition it considers student grievances. Information about academic regulations and advice about individual requests to the Committee may be obtained from the Office of the Dean, Engineering 100.

Academic Dishonesty

Intellectual honesty is an essential cornerstone of all academic and scholarly work. Therefore the university views any form of academic dishonesty as a very serious matter. The Academic Judiciary Committee of the College of Arts and Sciences is responsible for the establishment of guidelines for dealing with academic dishonesty in the College and for the consideration of individual cases, either initially or on appeal. Detailed procedures for hearings and other functions of the Committee are available from the Office of Undergraduate Studies.

Academic Grievances

The Academic Judiciary Committee of the College of Arts and Sciences considers complaints of arbitrary, capricious, malicious, or otherwise improper actions related to grading and other evaluations; assignments, examinations, and other requirements for credit; or any other academic matters. While such grievances are most often brought by students against instructors, the Committee will consider grievances involving any member of the College of Arts and Sciences community. However, the Committee cannot intervene in matters covered by the procedures set forth in the Policies of the Board of Trustees, the Rules for the Maintenance of Public Order, or the collective bargaining agreement between the State and United University Professions (the faculty-staff union).

The Committee considers only charges of clearly improper academic practices; it will not intervene in disagreements about an instructor's intellectual judgment. Grievances should be brought to the Committee only after other avenues of redress (e.g. discussion with the instructor or department chairman) have been pursued without success. Grievances should be put in writing, including names, dates, and other pertinent details, and should be submitted to the Committee at the Undergraduate Studies Office within two months after the date of the alleged impropriety. Further information about Committee procedures may be obtained from that office.

College of Engineering and Applied Science students seeking information on procedures should consult the Office of the Dean, College of Engineering.

Graduation Requirements

General Requirements

All candidates for any of the bachelors degrees conferred must satisfy all general University and departmental requirements for the specific

degree. For graduation, a minimum of 120 credit hours of passing work must have been completed for the bachelors degree except in certain areas of study where additional credits may be required.

A cumulative grade point average of at least 2.00 is required for all work undertaken after achieving upper division status (57 earned credit hours). In order to obtain a baccalaureate degree from Stony Brook, transfer students, including part-time matriculated students, must attain a minimum cumulative grade point average of 2.00 based on completion of at least 36 credits earned at Stony Brook, after achieving upper division status.

Residence Requirement

For a student to be certified for a degree, he or she must have earned at least 36 credit hours at Stony Brook after achieving upper division status.

Awards and Honors

Engineering juniors and seniors who have demonstrated academic excellence are invited to join Stony Brook's Omicron Chapter of Tau Beta Pi, the national engineering honor society.

The University pays tribute to its outstanding students through the conferring of awards, election to honorary societies, and granting of departmental honors. The following University awards are presented each year:

Ward Melville Valedictory Award

In honor of its first Chairman, the Council of the State University of New York at Stony Brook annually presents the University's most distinguished undergraduate honor, the Ward Melville Valedictory Award, to the graduating senior who has attained the highest academic average during four years at Stony Brook.

William J. Sullivan Award

The William J. Sullivan Award is presented annually by the Council of the State University of New York at Stony Brook in honor of Justice William J. Sullivan, retired Chairman of the Council. The Sullivan Awards are the most prestigious service awards the University can present to a graduating senior. They represent the University's recognition of particularly outstanding service contributions to the development of academic and student life on the campus.

United University Professions Award

The State University of New York at Stony Brook present the United

University Professions Award to that member of the graduating class who has most displayed an unselfish concern for the promotion and protection of human rights and values.

Elizabeth D. Couey Award

The State University of New York at Stony Brook presents the Stony Brook Union, Elizabeth D. Couey Award annually in memory of the first Coordinator of Student Activities. The award is presented to the graduating senior who exemplifies those qualities which made Elizabeth D. Couey unique and the most human of beings; to listen with understanding, to guide without boundaries, to give and take with love, and to grow with the passing of each day.

Junior Class Award

The Junior Class Award is presented annually by the Women's Club of the State University of New York at Stony Brook to two outstanding juniors—one man and one woman—in recognition of academic excellence and for personal contributions to the University community.

Departmental Awards

Department awards include: Chemistry—American Institute of Chemists Outstanding Student in Freshman Chemistry, Outstanding Senior Award and Emerson Award to Outstanding Junior Chemistry Major. Earth and Space Sciences—Myron Fuller Award and Sherman Raffenberg Award. History—Staudenraus Award. Italian—Dante Medal to the best graduating major; Italian Cultural Institute prizes to the best student of Italian on each level. Puerto Rican Studies—Outstanding Student Award.

Honorary Societies

Besides the annual awards listed above, induction into an honorary society acknowledges the student's outstanding academic performance. *Phi Beta Kappa* is a national honorary society devoted to the promotion of scholarly attainment in liberal arts and sciences. Election to Phi Beta Kappa is based not only on high grades but also on breadth, balance, and proportion in the candidates' programs.

Various disciplines have their own honorary societies. Those with chapters at Stony Brook include *Omicron Delta Epsilon* (Economics), *Phi Sigma Iota* (Romance languages), *Pi Sigma Alpha* (Political Science), and *Tau Beta Pi* (Engineering).

Departmental Honors Programs

While selection of students for all the above awards and honors is

based primarily upon University records and recommendation and not upon application, students must declare their intention to seek departmental honors and must carry out prescribed academic activities to earn this distinction. The honors programs of those departments offering them are described in the alphabetical listing of the College of Arts and Sciences. For those students who qualify, this fact is indicated on their diploma and on their permanent academic record.

Application for Graduation

In order to become a candidate for graduation, a student must file an "Application for Graduation" form with the Office of Records. The deadline for such application is the end of the first month of the candidate's final semester. Prospective August graduates must apply by the end of Summer Session I.

A graduating student wishing to make up incomplete work after the end of his or her last semester must file an application to postpone the date of graduation until the end of the following term. The same deadlines apply in such cases. No changes of grades can be made on a student's academic record after the degree has been awarded.

Transfer of Credit

Subject to certain limitations and conditions, course credit earned at other institutions may be applied to meet Stony Brook degree requirements. This is handled by the Admissions Office and that office should be consulted by currently enrolled Stony Brook students before work is undertaken at any other institution.

Student Educational Records

In compliance with the Family Educational Rights and Privacy Act, present and former students of State University of New York at Stony Brook or parents of minor or financially dependent students, have the right to inspect and review student educational records. For the exact procedure to follow, contact the Dean for Student Administrative Services at (516) 246-7000.

Student Directory

It is the policy of State University at Stony Brook to publish a Student Directory including student name, home address, telephone number, major and level. If a student does not wish to be listed in the Directory, or in the case of a minor student, a parent does not wish such listing, he/she will be required to so indicate at the time of registration.

Transcripts

Students who desire transcripts of their academic record at Stony Brook, either for their own use or for forwarding to some other insti-

tution or agency, are asked to submit their request in writing to the Office of Records at least two weeks before the transcript is needed except at the end-of-semester peak period when additional time should be allowed. The charge for transcripts is \$2 per copy. Payment should be made directly to the Bursar's Office and the receipt submitted to the Office of Records along with the transcript request. Partial transcripts of a student's record are not issued. Students will be provided with one free transcript upon request.

Study at Other Institutions

Students currently enrolled at Stony Brook have several options for transferring academic credit for study at other institutions.

Summer Study Elsewhere

To insure that projected courses will be fully acceptable for transfer credit, a student planning to take summer courses elsewhere should discuss plans in advance with both the academic advisor and the Stony Brook Admissions Office where he or she can obtain assistance in filling out a form listing the intended courses and their Stony Brook equivalents. After the Admissions Office receives an official transcript indicating that the student has completed the courses with a grade of C or better, appropriate transfer credit will be granted.

Visiting Student Program

A recently inaugurated state-wide program enables interested Stony Brook students to study for a semester or a year at one of more than 50 participating colleges and universities in New York State. The Visiting Student Program is approved by the State Education Department and full transferability of Regents Scholarships and Scholar Incentive Awards is assured. The unique purpose of the program is to allow students to explore possibilities of academic life in a variety of settings ranging from small and possibly specialized institutions to large academic communities such as Stony Brook.

To qualify for the program a student must have the advance approval of his or her academic advisor or department chairman and an official statement from the Office of Records that he or she is in good academic standing; the student must also accept full responsibility for tuition, fees and any similar charges in effect at the chosen school. Both a "Withdrawal from the University" form and a "Readmission/Leave of Absence" application must be completed prior to leaving Stony Brook.

Application forms and additional information about the Visiting Student Program may be obtained at the Office of Admissions; however, some campuses require the completion of supplementary forms that

must be secured directly from their admissions offices. Admission on each campus is usually on a competitive, space available basis.

Stony Brook students may also explore the possibility of attending colleges outside New York State as visiting students. Advance approval of courses and a leave of absence are required to insure readmission to Stony Brook at the end of one or two semesters.

Study Abroad

The State University of New York sponsors numerous academic programs abroad to provide qualified students with a variety of opportunities to spend a summer, a semester, or a full academic year studying at a university in a foreign country. Programs are available throughout Western Europe, the Middle and Far East, Canada and Latin America. Stony Brook, itself, sponsors programs in West Germany, Great Britain, the West Indies, Colombia, Poland, Japan and Israel.

In addition to the SUNY-sponsored programs, individual academic programs may be designed independently by the student to fit special interests and abilities.

Whether the student wishes to take part in a SUNY-sponsored program or in some other form of study abroad, he or she should discuss plans with an academic advisor to make sure that courses are suitable for transfer credit. Information about SUNY-sponsored programs and other opportunities for study abroad can be obtained from the Office of International Education.

Leave of Absence and Withdrawal from the University

Leave of Absence

Students currently attending Stony Brook who wish to withdraw from the University and petition for a leave of absence should secure and complete an "Application for Readmission and/or Leave of Absence" form. This form is available from the Admission Office.

Exit interviews may be arranged with Admissions personnel if students are applying for a leave of absence. Students who are withdrawing from the University without requesting a formal leave of absence and readmission should arrange an exit interview with the Office of Undergraduate Studies. Students granted a leave of absence at the time of their withdrawal from the University are regarded as approved for readmission provided they return at the time prescribed. Failure to return as scheduled cancels the leave agreement unless an extension has been granted by the Admissions Office. Requests for extensions should be submitted to the Admissions Office at least two months prior to the beginning of the semester agreed upon when the leave of absence was approved. Students for whom extensions have not been granted will be considered together with transfer admission candidates if they wish to return at a later time.

The leave of absence form is not the appropriate one for withdrawal from the University. Use the form entitled "Withdrawal from the University." Approval of a leave of absence request simply guarantees readmission at a specific time. Placing an application for a leave of absence and being granted such a request, do *not* constitute formal withdrawal from the University.

Withdrawal from the University

Withdrawal from the University, for any reason, will be recorded when the form entitled "Withdrawal from the University" has been completed and submitted to the Registrar. These forms may be obtained from the Office of Records. The date upon which the form is filed, and not the date of the last class attendance, is considered the official date of withdrawal. Non-attendance or notification to the instructors does *not* constitute formal withdrawal.

Students who submit withdrawal forms to the Registrar after the first two weeks but not later than the final day of classes in a semester will be assigned a withdrawal grade of WP or WF (NC if the Pass/No Credit option has been elected) in each course. A withdrawal after the last day of classes is effective at the end of the semester; final grades will be assigned and the withdrawal will not preclude academic dismissal.

Readmission to the University

Students who have withdrawn, whether officially or unofficially, whether within a term or after the end of a term, or who have been dismissed and wish to be readmitted must apply for readmission through the Admissions Office. Applications for readmission should be filed at least *three months* prior to the semester for which readmission is desired. Readmit applicants who were not granted a leave of absence will be considered together with transfer admission candidates in accordance with the qualifications and standards that apply to that group. Official transcripts must be submitted to the Admissions Office if students have attended other educational institutions after leaving Stony Brook.

Students under academic or disciplinary dismissal must be removed from that status by the appropriate University body in order to be considered by the Admissions Office for readmission. Routine clearances are secured in these matters after applications for readmissions have been received by the Admissions Office. Interviews are encouraged with admissions personnel if an applicant wishes to discuss particular situations.

In the case of students who have been dismissed for academic reasons, at least one semester must elapse before they will be considered for readmission, and such readmission requires the approval of the Committee on Academic Standing. A student who has been dismissed twice is not eligible for readmission. Students who have been dis-

missed for academic reasons but whose period of dismissal has been waived by the Committee on Academic Standing do not need to apply for readmission.

An applicant who is denied readmission may appeal to the Admissions Committee for a hearing. All elements of procedural due process as required by the University will be made available. An applicant whose account with the Business Office is delinquent may be readmitted but will not be authorized to register until he clears his account.

Changes in Regulations and Course Offerings

The courses of study, academic regulations, and other information contained in this *Bulletin* are subject to the restrictions of the timetable and date of publication of the *Bulletin*. The University, therefore, reserves the right to change academic regulations or to cancel any course for whatever reason it may deem appropriate.





College of Arts and Sciences

Degree Requirements

All candidates for the Bachelor of Arts or Bachelor of Science degree must satisfy the following general University requirements, normally by attaining a passing grade in appropriate courses. Exemption and/or semester hour credit may be earned by passing special examinations.*

A. Proficiency in English Composition *Credits*

All entering students are expected to demonstrate competence in the clear and logical expression of ideas in written English. This requirement may be met by passing the English proficiency examination or by completing EGL 101 English Composition

3

B. Natural Sciences and Mathematics

Two semester courses, to be chosen from among the offerings of the following departments or divisions: biological sciences, chemistry, earth and space sciences, engineering, mathematical sciences, and physics

6-8

Note: Not acceptable to satisfy the natural sciences and mathematics requirement are the following courses:

1. Engineering: ESI 098, 100, 190, 191, 200.
2. Mathematical Sciences: MSM 101, MSC 100.

C. Social and Behavioral Sciences

Two semester courses, to be chosen from among the offerings of the following departments or interdisciplinary programs: Africana Studies,** anthropology, Asian studies, economics, education, history, Ibero-American studies, linguistics, political science, psychology, Puerto Rican studies,** social sciences interdisciplinary program and sociology. (Student teaching courses may not be used to meet this requirement.)

6-8

D. Arts and Humanities

Two semester courses, to be chosen from among the offerings of the following departments or interdisciplinary programs:

*See information on advanced placement and the Challenge Program examinations as a means of earning semester hour credit toward graduation, page 42 of this *Bulletin*.

**Appropriate choices are identified in lists heading the sections of the *Bulletin* where the courses are described.

Africana studies,** art, Chinese, classics and classical languages, comparative literature, English, French, Germanic and Slavic languages, Hebrew, Hispanic languages, Italian, music, philosophy, religious study and theatre arts.

6-8

Note: Not acceptable to satisfy the arts and humanities requirement are the following courses:

1. Art courses: ART 111, 112, 255, 256.
2. English courses: EGL 101, 102, 107, 108.
3. Foreign language courses below the intermediate, i.e., second year level.
4. Music: performance or studio courses MUS 114, 115, 116, 151 and the first two semesters of MUS 161-199 and MUS 261-299.
5. Theatre Arts courses: THR 114, 116, 130, 230.

E. *Residence Requirements*

In order to obtain a baccalaureate degree from Stony Brook students must have completed at least 120 credit hours of passing work, including at least 36 credits earned at Stony Brook after achieving upper division status (57 earned credit hours).

F. *Academic Standing*

For graduation students must have attained a minimum cumulative grade point average of 2.00, i.e., C-level, after achieving upper division status.

Students should complete the above requirements A through D as early in their programs as possible, ordinarily within the freshman year, and *must* complete EGL 101 during that period. Exemption from any of the course requirements under A through D may be granted upon recommendation of the department or other agency supervising the course. Questions about requirement E should be addressed to the Undergraduate Studies Office.

Degree Programs and Independent Study Projects

Three different degree programs leading to the Bachelor of Arts or Bachelor of Science degree are open to students in the College of Arts and Sciences. (For information about degree programs in the College of Engineering and Applied Sciences, see that section of this *Bulletin*.) Freshmen should postpone formal choice of a degree program until at least the end of the first year, which should be used to explore a variety of fields of study and to complete as many as possible of the University requirements. The three choices of degree programs are:

**Appropriate choices are identified in lists heading the sections of the *Bulletin* where the courses are described.

I. The Departmental Major

This program consists of study concentrated in one of the academic departments of the College of Arts and Sciences and allows the student to explore in some depth the content, methods, and achievements of a given academic discipline. Departmental requirements and course offerings are listed in detail, and in alphabetical order by department, in this section of the *Bulletin*. They should be carefully considered and discussed with the student's academic advisor or a member of the department.

II. The Interdisciplinary or Interdepartmental Major

This choice of degree program allows the student to investigate an area of concern which transcends the limits of individual academic departments by combining appropriate courses from two or more disciplines to create an integrated core of study directed toward a special goal. Interdisciplinary programs are described in detail in this section of the *Bulletin* under individual headings alphabetically arranged. For further information consult the Undergraduate Studies Office or the director of the program.

III. The Liberal Arts Major

This is a program leading to the baccalaureate degree by means of a plan of study developed by the student to meet individual interests. It is based on 60 course credits of work in courses beyond the introductory level. For further details consult the alphabetical listing in this section of the *Bulletin*. Advisors in the Undergraduate Studies Office will help the student to plan a program.

IV. Independent Study Program

Within each of the three degree programs described above, a student may wish to undertake independent study. This option is designed to allow the student, in consultation with appropriate faculty members, to develop an individual course of academic investigation and study. The procedure for obtaining approval of an independent study project is as follows: the student prepares a brief written outline of the study project, indicating its scope and purpose and the methods which will be used to conduct it. The student must then obtain from two faculty members written approval of the project and agreement to supervise it and to recommend appropriate academic credit. The completed dossier—project outline and endorsements—is then submitted by the sponsoring faculty member to the appropriate college committee for review. If independent study is undertaken as part of a departmental or interdisciplinary major, the student and the primary sponsor should arrange for written approval through departmental channels. The dead-

line for submitting proposals is announced early each semester for the following semester. Students whose proposals are approved register for ISP 200. Independent study projects may be distributed throughout the undergraduate years, although in most cases freshmen should complete the general University requirements before proposing independent study. A total of 30 credits of independent work, including all ISP 200 credits and all credits in departmental directed readings and research courses (see below), may be offered toward the degree requirement of 120 hours and as many as 18 credits may be earned in one semester. For further information consult the Undergraduate Studies Office.

V. Directed Readings and Research

Another form of independent study may be done outside of the Independent Study Program outlined above. With departmental permission, a student may enroll for no more than six credits of directed readings or research in a single department in any given semester. More than six credits of such courses are permissible if they are in more than one department. However, a student wishing to do an interdisciplinary project should be directed to the Independent Study Program.

Teacher Preparation

The University offers programs to prepare students to become teachers in secondary schools. Students who complete Stony Brook's approved sequences are eligible for provisional teacher certification by New York State. They should plan to complete the requirements of either a departmental major or an interdisciplinary major and consult their major (or prospective major) department for assistance as early as the second semester of the freshman year. The University is no longer accepting students for elementary school teacher training.

Incoming Student Seminars

The Incoming Student Seminars are a special group of courses designed for freshman students, and are limited to fifteen participants in each seminar. They afford the new student an opportunity to be introduced to intellectual inquiry in a small group, to meet at least one faculty member on a personal basis, and to improve basic reading, discussion, and writing skills at the outset of the student's college career.

In general, ISS courses are in subject matters not duplicated by the regular departmental offerings. They are credit courses, offering three credits toward the bachelor's degree. There are no prerequisites for these courses, and the seminars themselves are not prerequisites to any other courses. A brochure describing the seminars for fall semes-

ter is distributed during the summer at freshman orientation; the brochure describing spring semester seminars is available on campus in the fall.

For those students enrolled in ISS courses, the instructor becomes the student's academic adviser until such time as the student declares a major.

In addition, a number of one-credit seminars are available in connection with several basic introductory courses for which there is normally a large registration, particularly in the sciences and mathematics. Like the three-credit ISS courses, they are optional, but will be related to the subject matter of the course with which they are connected.

Information About Course Credit

1. Only courses stating in the description that they may be repeated may be taken more than once for credit.

2. Certain courses may be taken only with the permission of the instructor or of the department; this is listed as a prerequisite for the course. For courses with specific course prerequisites, "or permission of instructor" is always understood. That is, a student who thinks he or she has acquired the knowledge necessary for the course through other means than taking the listed prerequisites may ask the instructor's permission to take the course. Students registering in courses without proper permission may be de-registered.

3. Courses with "Teaching Practicum" in the title are available in some departments to provide credit for upper division students who serve as teaching assistants. T.A. credit may be earned only through these courses and can account for only 3 credits out of the 120 credits required for graduation.

4. Upper division students with superior academic records may, with the permission of the Dean of the Graduate School, take graduate courses for undergraduate credit. Permission should be sought through the instructor and the chairperson of the department offering the course.

5. Undergraduates may not take courses offered by the Center for Continuing and Developing Education (C.E.D.) for undergraduate credit.

6. INT 280, 281 and INT 298, 299, as well as all 100-level Physical Education courses have been designated "activity-related" courses. Students are limited to a total of 9 credits in activity-related courses out of the 120 credits required for graduation. Of these 9 credits no more than 4 credits may be in 100-level Physical Education courses.

Interdisciplinary Program in Africana Studies

Assistant Professors: Lebert Bethune, Canute N. Parris, Annie Mae Walker, Edgar Wasswas

Lecturer: Rupert D. Vaughan

The Africana Studies Program is interdisciplinary in scope and addresses itself to the experiences of persons of African descent throughout the world. It is designed to explore African civilizations and their influences on other parts of the "Black Diaspora." The complex questions within the black international communities in Africa, the New World and elsewhere will be examined from both historical and contemporary perspectives. Particular attention will be focused on political concepts, cultural development, legal relations and social theories.

Requirements for the Major in Africana Studies

In addition to the general University requirements for the Bachelor of Arts degree, majors in the Africana Studies Program must complete the following:

A. <i>Required Courses</i>		<i>Credits</i>
AFS 100	The Black Experience in Transatlantic Perspectives..	3
AFS 102	Socio-Cultural Features as Expressions of the Afro-American Experience	3
AFS 104, 105	Elementary Kiswahili I, II	6
AFS 230	Pan-African Literature	3
AFS 251	Education of the Afro-American in America	3
AFS 255	The Politics of Race	3
AFS 256	History of West Africa	3
AFS 399	Research in Africana Studies	3
B. <i>Elective Courses</i>		
Three additional AFS courses chosen in consultation with the student's major advisor		9
Total		<hr/> 36

Special Information on Courses

1. Appropriate choices to satisfy the general University requirement in the arts and humanities are the following courses: AFS 100, 101, 190, 191, 211, 230, 231, 276.

2. Appropriate choices to satisfy the general University requirement in the social and behavioral sciences are the following courses: AFS 102, 200, 201, 239, 240, 241, 254, 255, 256, 258, 259, 261, 262, 263, 270, 271, 272, 273, 290, 301.

3. AFS 299 Readings in Africana Studies and AFS 399 Research

in Africana Studies will be appropriate choices to satisfy the requirements in the arts and humanities or in the social and behavioral sciences, depending on their specific content.

Courses*

AFS 100, 101 The Black Experience in Transatlantic Perspectives I, II

An historical assessment of the experience and conditions of peoples of African descent in the perspective of time. The course will concentrate on the theme of Black Diaspora. It will attempt to examine and describe the similarities and the differences among the life styles of black people in Africa, the Caribbean and America, with particular emphasis on the United States. This course is required of all potential Africana Studies majors.

Fall and spring, 3 credits each semester

AFS 102 Socio-Cultural Features and Expressions of the Afro-American Experience, Part I

A course designed to focus on a consideration of primary cultural institutions and expressions of black people in the Americas. The course will treat, comparatively, the character, development and function of basic cultural patterns in the United States and selected societies within the circum-Caribbean.

Fall, 3 credits

AFS 104, 105 Elementary Kiswahili I, II

An introduction to spoken and written Kiswahili, stressing pronunciation, speaking, comprehension, reading and writing. Selected readings from contemporary texts will be included. Practice in the language laboratory supplement class work.

Fall and spring, 3 credits each semester
E. Wasswas

AFS 106 Education in Basic University Skills

This course is designed to introduce students to approaches in doing social science within an interdisciplinary framework. Readings in Black Studies will be used to develop skills in the gathering

and processing of data, the making of logically sound judgments, the expression of generalizations and the use and analysis of social science categories.

Prerequisite: Permission of instructor.

Fall and spring, 3 credits

C. Parris

AFS 190, 191 Intermediate Kiswahili

An intermediate course in the reading and discussion of selected Swahili texts. An intensive grammar review with practical language laboratory exercises will offer an opportunity to develop conversational ability.

Prerequisite: AFS 105.

Fall and spring, 3 credits each semester

E. Wasswas

AFS 200, 201 American Attitudes Towards Race I, II

An historical examination of the growth and development of racism in America. It will focus on the writings of non-black Americans as they have attempted to explain their views of blacks. The course will concentrate on primary materials, using secondary sources only when they shed particularly useful light on social conditions underlying attitudes during a given era.

Prerequisites: Two semesters of introductory AFS courses.

Fall and spring, 3 credits each semester

R. Vaughan

AFS 211 Comparative African Religions

A general survey of the religious beliefs and practices of primitive peoples with special reference to symbols and value systems. The effects of culture contact on religious behavior and the basic religious beliefs of more complex African societies will be discussed.

Prerequisites: AFS 100, 101 and/or 102.

Fall, 3 credits

E. Wasswas

*See p. 75, Information About Course Credit.

AFS 230, 231 Pan-African Literature I, II

An examination of the cultural themes of Pan-Africanism and Negritude, drawing on a selection of writers from the U.S., Africa and the Caribbean. The course will treat the development, diffusion and significance of these themes; it will involve intensive consideration of selected literary works of African and Afro-American expression.

Prerequisites: Two semesters of AFS courses chosen from AFS 100, 101, 259.
Fall and spring, 3 credits each semester

AFS 239 Seminar in Methods, Materials and Resources in Afro-American Studies

Review and analysis of instructional resources and methods available for use in Afro-American studies in schools and institutions of higher education. Identification and generation of primary and secondary courses.

Prerequisites: Junior or senior standing and permission of instructor.
Fall, 3 credits

AFS 240, 241 Political History of East Africa I, II

A general survey of the cultural and political history of East Africa, emphasizing Tanzanian, Ugandan and Kenyan experiences. AFS 240 is identical with POL 205.

Prerequisites: Two semesters of introductory AFS courses.

Fall and spring, 3 credits each semester
E. Wasswas

AFS 251 Education of the Afro-American in America

An analysis of significant research and publications on the education of the Afro-American in America from Reconstruction to the present. Emphasis will be placed upon social, economic, political and psychological factors which have conditioned educational opportunities for Afro-American citizens. Components of the present social crisis in America will be examined. This course is identical

with EDU 251.

Prerequisite: Permission of instructor.

Fall and spring, 3 credits

A. Walker

AFS 253 Lecture Series in Africana Studies

A series of lectures delivered by distinguished visitors on the transcontinental experiences of Africans and persons of African descent. Special attention will be focused upon the theory and practice of neo-colonialism.

Schedule to be announced, 3 credits

AFS 254, 255 The Politics of Race

An analysis of the role which race plays in national policy formulation in the United States. The following topics will be examined: the institutionalization of racism in the American political culture; how blacks perceive political reality; elitism and pluralism; non-violence; patriotism and black nationalism; black politics and black power; the response of government to the demands of blacks; new political forms; future directions in black-white political relations. AFS 255 is identical with POL 240.

Prerequisite: Two previous courses in the social sciences or sophomore standing.

Fall and spring, 3 credits

C. Parris

AFS 256 History of West Africa

A general survey of the cultural and political history of the peoples of West Africa from about 1000 to 1950.

Fall and spring, 3 credits

R. Vaughan

AFS 258 The Politics of Africa

A study of nationalism, political thought and political institutions in Africa. Consideration is given to the quest for unity, the problems of liberation and the political implications of social change. This course is identical with POL 210.

Prerequisites: Two courses in the social sciences or sophomore standing.

Fall and spring, 3 credits

C. Parris

AFS 259 Socio-Cultural Features and Expressions of the Afro-American Experience, Part II

The course will be devoted to detailed analysis of contemporary institutional features and aspects of black culture in the United States with special concern for their implications for educational and political socialization among Afro-Americans in urban areas.

Prerequisites: Two courses in the social sciences or AFS 102.

Spring, 3 credits

AFS 261 Seminar in Afro-American Anthropology

A research-oriented seminar principally concerned with an examination and re-evaluation of theories and concepts of culture germane to the Afro-American experience. Open to qualified non-majors.

Prerequisites: Junior or senior standing and permission of instructor.

Spring, 3 credits

AFS 262 The Politics of the Caribbean

This course systematically analyzes the national and international developments that have shaped the various Caribbean political systems since World War II. However, special emphasis will be placed on developments over the past decade.

Prerequisite: Six credits in the social sciences.

Fall, 3 credits

C. Parris

AFS 263 Political Analysis of Pan-Africanism

This course is designed to develop a generalized (and in some instances a specialized) understanding of the politics of Pan-Africanism both on the continent of Africa as well as among peoples of African ancestry. However, special emphasis will be on the continent of Africa itself.

Prerequisites: AFS 258, or a course in international relations, international economics, comparative government or AFS 230, 231.

Fall and spring, 3 credits

C. Parris

AFS 270, 271 Black Social Commentary: 1619 to Present

A survey of black responses to oppression in America. The course will concentrate on the various ways black people have conceptualized and described their condition. Particular attention will be paid to the solutions proposed by black spokesmen during various historical eras. Primary sources will be used almost exclusively.

Prerequisites: Two introductory courses in Africana Studies and permission of instructor.

Fall and spring, 3 credits each semester

AFS 272, 273 Contemporary Political Thought and the Black Community in the U.S.A.

A critical analysis of the major architects of black political consciousness and their movements in the context of their distinctive historical development. Emphasis will be upon the intellectual and ideological ferment of the 1920's (DuBois, Randolph, Garvey, et al.) and the 1960's (King, Muhammad, Malcolm, Karenga, Jones, Fanon, Black Panther Party, etc.). Primary materials and documents will be used exclusively.

Prerequisites: Two semesters of introductory AFS courses and/or two semesters chosen from AFS 230, 231, 255.

Fall and spring, 3 credits each semester

AFS 276 Islam and Africa

The historical development of Islam in Africa. Examination of its impact on African societies. Historical and philosophical viewpoints that highlight the contrast between the indigenous African value systems and those of Islamic belief.

Prerequisite: Permission of instructor.

Spring, 3 credits

R. Vaughan

[For AFS 282-287, see Caribbean Studies Program, below.]

AFS 290 Legal Process and Social Structure

A critical evaluation of the administration of justice, legal institutions and legal process in relation to prevailing social

structure.

Prerequisite: Two semesters of introductory courses in the social sciences.

Fall and spring, 3 credits

AFS 299 Readings in Black Studies

May be repeated once.

Prerequisite: Permission of department.

1 to 3 credits

AFS 300 Wider Horizons

This course addresses itself to aspects of developmental problems within a black community on Long Island. Attention is focused on social and educational issues that relate to the children of low-income, disadvantaged families. The course is comprised of seminars, workshop and practical application components. Readings emphasize non-standard approaches to learning, stressing the philosophical and psychological bases of educational processes through extensive use of primary materials.

Prerequisites: Two previous Africana Studies courses and permission of instructor.

Fall and spring, 3 credits

R. Vaughan

AFS 301 Aspects of African Law

This course will investigate some kinds of African customary law and will specifically consider the African concept of liability insofar as it affects contractual obligations, tortious conduct, family relations, the responsibility of the individual to the larger social group and other areas of the law.

Prerequisite: Permission of instructor.

Fall and spring, 3 credits

Caribbean Studies Program

The Caribbean Studies Program is a two-semester, 30-credit foreign study program offered under the joint auspices of the Office of International Education and the Africana Studies Program. Students may enroll for either or both semesters of the program. By way of a full complement of lectures, seminars, and supervised field work, in addition to the cross-cultural experience of living in a Caribbean society, the student is afforded a thorough, practically based introduction to the area of study.

AFS 339 Education of the Black Pre-School Child

This course will be conducted as a seminar and will focus on essential aspects of the education of the black pre-school child. An analysis will be made of the socialization process of the black child and the logic and psychological implications of the use of non-standard or black English as a vehicle of learning. Traditional and contemporary philosophical ideas influencing curriculum design teaching will be considered and their relevance to the black experience examined.

Prerequisites: AFS 102 and AFS 259.

Fall and spring, 3 credits

R. Vaughan

AFS 340 Racial Fragmentation and Black Economic Development: East Africa

The course will focus on the manifestations between economic issues and race relations in contemporary East Africa. Problems facing the black man in the racially fragmented societies of Africa and the three-tier socio-economic structure are examined.

Prerequisite: AFS 240 or 258.

Fall and spring, 3 credits

E. Wasswas

AFS 399 Research in Africana Studies

May be repeated once, but only 3 credits will count toward fulfillment of major requirements.

Prerequisite: Permission of department.

1-3 credits

The Program is open to Seniors and Juniors. An interview with a selection committee is required of all applicants for admission to the program. Course prerequisites include AFS 262 The Politics of the Caribbean or ANT 219 Caribbean Cultures and ANT 200 Foundations of Social Anthropology or SOC 201 Research Methods in Sociology.

Courses

AFS 282, 283 Issues in Caribbean Society

An interdisciplinary series of lectures designed to provide students with a broad topical introduction to fundamental issues in Caribbean societies. Topics selected will include education, government, race and identity, religion, tradition and cultural continuity.

Corequisites: AFS 284, 285 and AFS 286, 287.

Fall and spring, 3 credits each semester
L. Bethune

AFS 284, 285 Seminar on Caribbean Culture

A seminar designed to promote systematic reflection and examination of the students' academic and ongoing cross-cultural experience within the milieu of Jamaican society and culture. Research paper required.

Corequisites: AFS 282, 283 and AFS 286, 287.

Fall and spring, 6 credits each semester
L. Bethune

AFS 286, 287 Field Studies in Community Development

A research oriented project designed to provide experience in community development through direct participation in a social development project in Jamaica; the course is also designed to foster the development of qualitative field research skills—participant observation and in-depth interviewing. Research paper required.

Corequisites: AFS 282, 283 and AFS 284, 285.

Fall and spring, 6 credits each semester
L. Bethune

Department of Anthropology

Professors: Paula Brown, Pedro Carrasco (*Chairman*), Louis C. Faron, Edward P. Lanning

Associate Professors: David Hicks (*Director of Undergraduate Studies*), Robert F. Stevenson, Phil C. Weigand (*Chairman*), Margaret C. Wheeler, William Arens, June Starr

Assistant Professors: Richard E. Gardner, Rex Jones, Theodore R. Kennedy, Dolores Newton (*Museum Curator*)

The undergraduate program in anthropology is designed to provide the student with an introduction to the general field of anthropology, its branches, its theories and methods and its relation to the other social sciences and the humanities. It is also intended to provide the anthro-

pology major with an academic background preparatory to a graduate program in anthropology. The curriculum emphasizes the fields of cultural, social and ecological anthropology. The University Museum operates in conjunction with the Anthropology Department and offers a program of training and research in material culture and museology.

Requirements for the Major in Anthropology

In addition to the general university requirements for the Bachelor of Arts degree, the following requirements must be met for the major in anthropology:

Study within the area of the major for a total of 30 credits:

1. ANT 102 Introduction to Social and Cultural Anthropology.
2. ANT 200 Foundations of Social Anthropology.
3. Two ethnographic area courses to be selected from the following: ANT 201, 203, 204, 206, 207, 209, 211, 212, 213, 218, 219.
4. Two topical courses in society and culture to be selected from the following: ANT 250, 251, 252, 253, 254, 255, 256, 261, 262, 263, 268, 271, 280.
5. One prehistory course to be selected from the following: ANT 130, 209, 217, 258, 259, 260, 264, 265.
6. One advanced seminar to be selected from the following: ANT 301, 303, 304, 306, 308, 309, 391, 392.
7. Six additional credits in Anthropology.

Honors Program in Anthropology

Students with a good general academic record and a grade point average of 3.0 or better in all anthropology courses may enter the honors program. The student should develop a plan of study with a faculty sponsor, to be approved by the chairman and the director of the undergraduate studies. In addition to the requirements for the major in anthropology, the student will take further work in 300-level courses for a total of 33 or more credits in anthropology. During the senior year, the student will prepare the honors thesis, based upon independent research. The paper will be judged by two or more faculty members, who may recommend honors in anthropology. Course credit for the honors thesis is usually in ANT 310, but in some instances another 300-level course may be appropriate.

Courses*

ANT 102 Introduction to Social and Cultural Anthropology

An analysis of the principles of social structure among simpler societies through an examination of various forms of kinship, marriage, family, age group, voluntary associations and various levels of political, juridical or religious and economic organization.

Fall and spring, 3 credits

W. Arens, R. Gardner, D. Hicks, R. Jones

ANT 120 Fundamentals of Physical Anthropology

A consideration of man's biological and cultural heritage through the study of: (1) physical characteristics and behavior of selected fossil and living primates, (2) physical and cultural characteristics of the Pleistocene hominids, with the relevant prehistoric archaeology, (3) a brief survey of a group of living hunters. Current research on human origins, genetics, evolution, race and primate and human ethology will be discussed.

Fall and spring, 3 credits

M. Wheeler

ANT 121 Laboratory in Introductory Physical Anthropology

A supervised laboratory in physical anthropology. Activities include comparative anatomy of the higher primates; measurements in physical anthropology; and opportunity to study casts of fossil materials.

Prerequisite or corequisite: ANT 120.

Fall and spring, 1 credit

M. Wheeler

ANT 130 Introduction to Old-World Prehistory

This course is an overall survey of the prehistory of Africa, Europe, and Asia from the paleolithic to the neolithic periods (2 million to 4,000 B.C.). There is an emphasis on ways in which the material culture which still remains

from these periods shows the ecological adaptations of man to his changing physical environment.

Spring, 3 credits

ANT 200 Foundations of Social Anthropology

An examination of the development of theory in social anthropology. Various theoretical approaches will be applied to analyses of ethnographic data and topics of concern to social anthropology. The aim will be to provide anthropology majors with a broad and sophisticated preparation for advanced courses in the department.

Prerequisite: ANT 102.

Fall and spring, 3 credits

W. Arens, J. Starr

ANT 201 Peoples of South America

The course begins with a detailed coverage of problems of cultural and social evolution in South America during pre-Spanish times and continues this descriptive analysis into the colonial and contemporary periods wherever possible. Major or representative types of socio-cultural systems are discussed from a structural-functional point of view. Consideration is given to problems of cultural and social stability and change in the areas of kinship and marriage, politics, economics, religion, law, etc.

Prerequisite: ANT 102.

Fall, 3 credits

L. Faron

ANT 203 North American Indians

The various peoples and cultures of North America will be studied with respect to their political, educational, linguistic, social and cultural patterns. Selected societies will be studied in depth.

Prerequisite: ANT 102.

Spring, 3 credits

R. Jones

*See p. 75, Information About Course Credit.

ANT 204 Peoples of Africa

The range and distribution of African populations, languages and socio-cultural systems are surveyed in both full historical perspective and environmental context. Special attention is paid to the implications of anthropological theory. The general survey is supplemented by intensive analysis of select socio-cultural systems. The course concludes with an assessment of the problems of the emerging African nation-states and of current research problems, programs and goals in Africa.

Prerequisite: ANT 102.

Fall, 3 credits

W. Arens, R. Stevenson

ANT 206 Peoples of Asia

A survey of cultures and societies of Asia, with emphasis on the contemporary simpler societies and their integration into the complex civilizations.

Prerequisite: ANT 102.

Spring, 3 credits

R. Jones

ANT 207 Indians of Middle America

The transformation of Indian societies after the Spanish conquest. Culture and social institutions of the modern Indian: economic organizations, village government, religion, etc. The place of the Indian in the social structure of Mexico and Guatemala.

Prerequisite: ANT 102.

Spring, 3 credits

P. Carrasco

ANT 209 Ancient Civilizations of Middle America

The civilizations of Mexico and Central America at the time of the Spanish conquest. Ecological adaptation, economic systems, social and political institutions, religious and intellectual achievements.

Prerequisite: ANT 102.

Spring, 3 credits

E. Lanning

ANT 211 Peoples of Southeast Asia and Indonesia

Ethnographic, ethnological and structural-functional analysis of selected tribal, peasant and changing societies of mainland Southeast Asia and/or Indonesia-Malaysia.

Prerequisite: ANT 102.

Spring, 3 credits

D. Hicks

ANT 212 Peoples of Oceania

The study of the environment and cultures of Pacific island communities of Melanesia, Micronesia and Polynesia. Economic, kinship, political and religious institutions will be considered as they have been and are now changing.

Prerequisite: ANT 102.

3 credits

P. Brown

ANT 213 China: The Social and Cultural Background

The development of Chinese culture from prehistoric times through the present is analyzed from the standpoint of anthropological theories of cultural evolution, diffusion, functionalism and human ecology. Special attention is directed to critical formative and transitional periods. Distribution of physical types, languages and ethnicities both within and without the Chinese frontiers is surveyed. Interpretations of Chinese development generated by sister disciplines are discussed with a sympathetic but critical point of view.

Prerequisite: ANT 102.

3 credits

R. Stevenson

ANT 217 North American Archaeology

A survey of the archaeological and historical Indian cultures of North America, excluding ancient Mesoamerica. Northern Mexico, the American Southwest and the American Southeast (including the Mississippi Valley) will be the areas stressed. Contact situations, including European colonization and conquest pat-

terns, will be discussed.

Prerequisite: ANT 102.

Fall, 3 credits

P. Weigand

ANT 218 Peoples and Cultures of the Middle East

An introduction to the diverse ethnic groups, languages, religions and socio-cultural systems of the Middle East. Special attention is given to the ecological and socio-cultural adaptations of nomads, villagers and urbanites. Turkey, Iran, Afghanistan, the Arab states and Israel will be considered in terms of their culture history and contemporary development.

Prerequisite: ANT 102.

Spring, 3 credits

J. Starr

ANT 219 Caribbean Cultures

The study of the environment, history and cultural and social institutions characteristic of the Caribbean area. Topics covered will include: pre-contact cultures, colonialism and the institution of slavery, contemporary economic and political organization, community structure, cults, mating patterns and household composition and pluralism and ethnic diversity.

Prerequisite: ANT 102.

Spring, 3 credits

R. Gardner

ANT 250 Economic Anthropology

Economic life of primitive peoples and pre-capitalistic civilizations with emphasis on the integration of the economy with technology and with social and political institutions.

Prerequisite: ANT 102.

Fall, 3 credits

P. Carrasco

ANT 251 Comparative Religious Systems

A survey of the religious beliefs and practices of primitive peoples with special reference to symbols and value systems. The effects of culture contact on

religious behavior and the basic religious beliefs of more complex societies will be discussed.

Prerequisite: ANT 102.

Fall and spring, 3 credits

R. Jones, M. Wheeler

ANT 252 Culture and Personality

Culture as a factor in personality and character formation: anthropological theory and constructs will be considered in relation to such concepts as "self," "personality" and "character." The interrelationships of anthropology with its sister disciplines in the behavioral sciences will also be considered, as well as its importance for cross-cultural studies of socialization, change and ethnopsychiatry.

Prerequisite: ANT 102.

3 credits

ANT 253 Political and Legal Anthropology

Description and analysis of political institutions. Selected examples will be taken from many areas of the world to show government, internal regulations and external relations in small bands, villages, tribes and states. Forms of social control, conflict and resolution of conflict, law and legal procedures will be considered.

Prerequisite: ANT 102.

Spring, 3 credits

J. Starr

ANT 254 Family and Kinship

Family and marriage. Common descent groups. Kindreds. Kinship terminology and kinship behavior. Fictive kinship. The place of kinship in the total social structure. Change and evolution.

Prerequisite: ANT 102.

Spring, 3 credits

P. Carrasco

ANT 255 Material Culture, Technology, and Primitive Art

This course will introduce various approaches to the study of material culture in its technological and artistic aspects,

using ethnographic and archaeological studies from many different cultures. Emphasis will be on viewing artifacts and their associated technologies within the context of a total culture, and in particular, to see the relationship between material and non-material forms of culture. Prerequisite: ANT 102.

Fall, 3 credits

D. Newton

ANT 256 Urban Anthropology

A review of current anthropological research on family and kinship behavior, status and role, personality, social stratification, mobility and assimilation patterns in contemporary urban societies.

Prerequisite: ANT 102.

Spring, 3 credits

M. Wheeler

ANT 258 Ways to Civilization

A comparative study of processes of cultural evolution from the beginnings of farming to the achievement of civilization in different parts of the world.

Prerequisite: ANT 102.

Fall, 3 credits

P. Weigand

ANT 259 Archaeology of Mexico and Central America

An introduction to concepts and methods of archaeological research applied to the study of the origins and development of pre-Columbian civilization of Middle America, with emphasis on the reciprocal relations between culture and environment. General trends in the areas of culture history and illustrative regional sequences from the establishment of sedentary farming communities to the eve of the Spanish conquest.

Prerequisite: ANT 102.

Fall, 3 credits

P. Weigand

ANT 260 Archaeological Studies in Society and Culture

Basic concepts and methods of archaeo-

logical research applied to the study of socio-cultural processes and to historical interpretation.

Prerequisite: ANT 102.

Spring, 3 credits

E. Lanning, P. Weigand

ANT 261 Peasant Societies and Cultures

The concept of peasantry will be examined from political, religious and social class angles, as well as from the more traditional economic view. These agricultural peoples, who are essentially preliterate and preindustrial, are described and analyzed especially in relation to the national societies of which they form a part. Special attention is given peasant societies in Latin America, Africa and Asia.

Prerequisite: ANT 102.

Fall, 3 credits

L. Faron

ANT 262 Prescriptive Alliance Systems

A comparative analysis of social and symbolic forms associated with prescriptive alliance, together with a survey of the various institutional and symbolic expressions of the principle of binary opposition.

Prerequisite: ANT 200, ANT 254.

Fall and spring, 3 credits

D. Hicks

ANT 263 Language and Culture

The study of linguistic behavior as an instrument for anthropological research, description and explanation. This course is identical with LIN 263.

Prerequisite: ANT 102 or LIN 102.

Fall, 3 credits

ANT 264 Problems in Old-World Prehistory

This course will encompass major problems in prehistory, with an emphasis on the Old World. Among the problems to be surveyed are the following: (a) dating techniques, (b) typologies, (c) demography and settlement patterns, (d) diffusion and migration, (e) independent

invention, (f) environmental adaptation.

Prerequisites: ANT 102, ANT 130.

Spring, 3 credits

E. Lanning

ANT 265 South American Archaeology

A review of South American prehistory, with emphasis on the evolution of various types of ancient cultures.

Prerequisite: ANT 102.

Fall, 3 credits

E. Lanning

ANT 266 Anthropology Museum Workshop

Advanced workshop and projects in material culture, technology and primitive art. Students will participate in design and construction of museum exhibits that will entail background study and individual research in this field.

Prerequisites: ANT 102, ANT 255.

Spring, 3 credits

D. Newton

ANT 267 Male and Female in Cross Cultural/Perspective

A study of the development and manifestation of sex roles in several different cultures, with an emphasis on the different adaptations of males and females in economics, politics, religion and education.

Prerequisite: ANT 200.

Spring, 3 credits

ANT 268 Symbolism

An analysis of ritual, oral literature and other art forms as they operate as modes of symbolic expression in preliterate societies, and an investigation of the structural and functional relationships between these and the social institutions and structures of a selected range of societies.

Prerequisite: ANT 200, ANT 251.

Fall, 3 credits

D. Hicks

ANT 271 Social and Cultural Change

An examination of the forms and processes of change which have been and now are taking place throughout the world, transforming isolated people of simple economy and social organization into participating members of modern states.

Prerequisite: ANT 102.

Fall, 3 credits

W. Arens

ANT 280 Culture and Ecology

Examination of man's adaptations to the wide range of world environments, such as food-gathering, fishing, hunting, farming and pastoralism. Intensive case studies concerning the selection, use and allocation of resources by human communities will be presented. Consideration will be given to a variety of theoretical approaches which have focused upon the interaction between environment and cultural behavior.

Prerequisite: ANT 102.

Spring, 3 credits

R. Stevenson

ANT 301 Development of Anthropological Theory and Method

An evaluation of the central ideas of several schools of anthropology since the latter 19th century, with an appraisal of their effect on contemporary anthropological theory and methodology.

Prerequisites: ANT 200 and upper division standing.

Fall, 3 credits

L. Faron

ANT 303 Evolution of the State

The theories of a number of seminal thinkers in social history, political theory, economics, sociology and anthropology are tested against the empirical results of contemporary anthropological research, both archaeological and ethnographic. Emphasis is upon Asia and Africa but New World materials are also

introduced for purposes of comparison.
Prerequisites: ANT 200 and upper division standing.
Fall, 3 credits
R. Stevenson

ANT 304 Problems in Political and Economic Development

The study of the political and economic problems faced by undeveloped peoples as they become modern nations, and a discussion of social, political and economic development. Each student carries out independent research on a nation, people, or problem, presents the material in a seminar and writes a paper on the research.

Prerequisites: ANT 200 and upper division standing.
Spring, 3 credits
P. Brown

ANT 306 Problems in African Ethnology

Research and intensive examination of select problems in African ethnology of both current and enduring interest. Students will present the results of their own directed research on aspects of these problems in the form of oral reports in seminar and term papers. Specific problem areas for consideration will vary from year to year and will be announced at the beginning of the term.

Prerequisites: ANT 200, ANT 204 and upper division standing.
Spring, 3 credits
W. Arens, R. Stevenson

ANT 308 Seminar in Latin American Cultures

Research and discussion about selected topics in the culture and social structure of Indian and peasant communities in Latin America.

Prerequisites: ANT 200 and upper division standing.
Fall, 3 credits
L. Faron

ANT 309 Seminar in Law and Anthropology

Intensive study of law-related problems in non-western societies. Topics include: local level law and the nation-state; conflict resolution in different communities; dispute settlement in and out of courts; class conflict; "folk experts" and law professionals; legal reasoning and judicial decision-making; law and development; legal change. The method is comparative. Monographs from Africa, the Middle East, Latin America, and the United States will be read.

Prerequisite: ANT 253 or SOC 254.
Spring, 3 credits
J. Starr

ANT 310 Readings in Anthropology

Individual advanced readings and research on selected topics in anthropology. Work may be submitted for honors in anthropology. May be repeated once. Prerequisites: ANT 200, senior standing and permission of department.
Fall and spring, 3 credits

ANT 312 Patterns of Empire

A comparative analysis of the social institutions of the early empires will be offered. The evolution of militarism, secular bureaucracies, long-distance trade, land use and tenure and other topics will be examined. Problems involved in the use of early documents and/or archaeological materials will be discussed.

Prerequisite: ANT 200 and upper division standing.
Fall, 3 credits
P. Weigand

ANT 371 Field Methods in Linguistics

Students will learn techniques of writing a grammar of language unknown to them by working with a speaker of that language. This course is identical with LIN 371.

Prerequisites: LIN 201 and LIN 211/EGL 280.
Spring, 3 credits

**ANT 391, 392 Special Seminar in
Anthropology**

Discussion of a specific area of current interest in anthropology. Topics will change and will be announced for each semester. Students will write papers on individual research topics.

Prerequisite: ANT 200 and upper division standing.

Fall and spring, 3 credits each semester

Department of Art

Professors: Lawrence Alloway, Leopoldo Castedo, Jacques Guilmain (*Chairman*), Irma Jaffe (*Part-time*), George Koras

Associate Professors: Edward Countey, James H. Kleege, Nina A. Mallory, Melvin H. Pekarsky, Robert W. White, (*Part-time*)

Assistant Professors: Greta Berman, Michael Edelson, Lewis Lusardi (*Adjunct*), Mavis Pusey

Lecturers: Jacqueline Barnitz, (*Part-time*), Judith Bernstein, (*Part-time*), Gabor Inke, Aldona Jonaitis, Constance Koppelman, (*Adjunct*), Claire Lindgren, Charles E. Moss, (*Part-time*), Louisa Shen Ting, (*Part-time*)

The undergraduate program in art is designed to provide the student with a general background in the theories and history of art, as well as training in basic studio techniques. The plan of study allows students great freedom in choosing their courses, enabling them to move in the direction in which they are most interested.

Requirements for the Major in Art

In addition to the general University requirements for the Bachelor of Arts degree, a minimum of 39 credits in art or related fields, of which 36 must be taken for letter grade (and three may be taken Pass/No Credit), are required for the major. No student may take more than a total of 45 credits of studio work, as courses or independent studies, to be counted towards degree requirements.

	<i>Credits</i>
<i>I. The major in Art History and Criticism</i>	
1. ART 101, or with permission of the departmental advisor only, any one of the following: ART 200, ART 202, ART 203, ART 204	3
2. ART 102, or with permission of the departmental advisor only, any one of the following: ART 205, ART 206, ART 207, ART 208, ART 209, ART 210, ART 212	3
3. Any one of the following: ART 241, ART 242, ART 243, ART 244, ART 351, ART 352	3
4. Fifteen additional credits in art history	15
5. ART 111 and ART 112, or—especially in the case of students who anticipate going on to graduate work in art history—a year of French, German, or Italian (or another language with the permission of the departmental advisor)	6
6. Nine credits in related fields—in consultation with the departmental advisor—usually in languages, history, or anthropology	9
<i>Total</i>	<u>39</u>

	<i>Credits</i>
<i>II. The major in Studio Art</i>	
1. ART 101	3
2. ART 102	3
3. ART 111	3
4. ART 112	3
5. ART 241	3
6. ART 243	3
7. At least three additional credits in art history/criticism/theory	3
8. Eighteen additional credits in studio, of which at least twelve must be in 200-level courses, and at least six in 300-level courses	18
<i>Total</i>	<u>39</u>

The studio major should note that requirements 1 through 6, above, are prerequisites for virtually *all* 300-level studio courses. Exceptions to requirements for the major and to course prerequisites listed below are by permission of the department only, and will be made only under special circumstances.

Honors Program in Art

The honors program is open to seniors majoring in art who have maintained a grade point average of at least 3.0 in their major field and

related disciplines. Students should apply for the honors program before the beginning of their senior year. The student must find a faculty member of the department to act as sponsor. The student, with the approval of the sponsor, must submit a proposal of a project, in writing, to the department. Acceptance into the honors program depends upon the approval of the proposal by the department.

In the art history area, the student's research project will be supervised by the honors advisor. In the practice of art area, the student will be expected to prepare a small one-man show or similar project (i.e., one large, more ambitious work) in lieu of a thesis, under the supervision of the honors advisor.

The student's project will be judged by a jury composed of at least two members of the Art Department and a faculty member from another department, recommended to the academic vice president by the chairman of the Department of Art. This pertains to students in both the art history and practice of art areas.

When the honors program has been carried out with distinction, conferral of honors will be contingent upon the student achieving a 3.4 grade average in all art courses taken in the senior year.

Courses*

Art History/Criticism

ART 101 History of Art and Architecture from Earliest Times to c. 1400

A survey of the history of art and architecture in the western world from its earliest beginnings to the end of the Middle Ages.

Fall and spring, 3 credits

A. Jonaitis, C. Lindgren.

ART 102 History of Art and Architecture from c. 1400 to the Present

A survey of the history of art and architecture in the western world from the end of the Middle Ages to the present.

Fall and spring, 3 credits

G. Berman, A. Jonaitis.

ART 200 Greek Art and Architecture

The study of ancient Greek art and archi-

ture from the earliest beginnings in the geometric period through the archaic, classical and Hellenistic periods.

Prerequisite: ART 101 or 102.

Spring, alternate years, 3 credits

C. Lindgren

ART 202 Roman Art and Architecture

The study of ancient Roman art and architecture from the Republic through the Constantinian period in Italy and the greater Roman world including the Iberian peninsula, Gaul, Britain, Germany, Greece, Asia Minor, Judea, Syria, Egypt, Cyrenaica and Tunisia.

Prerequisite: ART 101 or 102.

Spring, alternate years, 3 credits

C. Lindgren

ART 203 The Art and Architecture of the Early Middle Ages, 300-1100

The history of early Christian and Byzan-

*See p. 75, Information About Course Credit.

tine art, and the Germanic and Anglo-Irish traditions, the Carolingian "Renaissance," the Ottonian, Mozarabic and Anglo-Saxon schools.

Prerequisite: ART 101.

Fall, alternate years, 3 credits

J. Guilmain

ART 204 The Art and Architecture of the High Middle Ages, 1100-1400

The study of Romanesque and Gothic sculpture, architecture, painting (including stained glass and manuscript illumination), metalwork and ivory carving from c. 1100 to the crystallization of the "International Style," c. 1400.

Prerequisite: ART 101.

Fall, alternate years, 3 credits

J. Guilmain

ART 205 The Early Renaissance in Italy

Art in Italy in the 15th century, with special emphasis on the major figures of the period: Masaccio, Donatello, Piero della Francesca, Botticelli and the early Leonardo.

Prerequisite: ART 101.

Fall, alternate years, 3 credits

N. Mallory

ART 206 Early Netherlandish Painting

The development of the 15th century painting in the Netherlands will be studied from its origins in the late Gothic manuscript illumination to its last manifestations in the early 16th century. Major emphasis will be placed on the founders of the Netherlandish school: the Master of Flémalle, Jan van Eyck and Roger van der Weyden, and on the great figures of the end of the century: Hugo van der Goes, Geertgen and Bosch.

Prerequisite: ART 101 or 102.

Spring, alternate years, 3 credits

N. Mallory

ART 207 High Renaissance and Mannerism in Italy

Art in Italy in the 16th century. The High

Renaissance in Florence and Rome studied in the works of Leonardo, Michelangelo, and Raphael; in Venice with special emphasis on Titian. Mannerism in central and northern Italy.

Prerequisite: ART 101 or 102.

Fall, alternate years, 3 credits

N. Mallory

ART 208 Western Architecture from the 15th to the 18th Centuries

A survey of the history of the classical tradition in European architecture from the Renaissance to the Neo-Classical period, with stress on major figures such as Alberti, Palladio, Mansart, Wren and Adam.

Prerequisite: ART 101 or ART 200 or 202.

Fall, alternate years, 3 credits

N. Mallory

ART 209 Northern Renaissance Art

Painting and the graphic arts in Germany and the Netherlands in the 16th century. The rise of genres and Italian influences in Northern art. Emphasis will be placed on such major figures of the period as Dürer, Grünewald, Holbein and Bruegel.

Prerequisite: ART 102.

Spring, alternate years, 3 credits

N. Mallory

ART 210 Northern Baroque Art

Painting and sculpture in Holland, Belgium and France in the 17th century. Special emphasis will be placed on the works of such major figures as Rubens, Hals, Rembrandt and Poussin.

Prerequisite: ART 102.

Spring, alternate years, 3 credits

N. Mallory

ART 212 Baroque Art in Spain and Italy

Painting and sculpture in Italy and Spain in the 17th century. Special emphasis will be placed on the contributions of such major figures as Caravaggio, Bernini, and Velasquez.

Prerequisite: ART 102.

Fall, alternate years, 3 credits

N. Mallory

ART 214 Ibero-American Plateresque and Baroque Art and Architecture

A study of the painting, sculpture and architecture of Ibero-America from the 16th to the 18th centuries.

Prerequisite: ART 101 or 102.

Spring, alternate years, 3 credits

L. Castedo

ART 215 Latin American Art

A survey of the art and architecture of Ibero-America from the pre-Columbian civilizations to the present time, emphasizing Creole or *mestizo* expressions.

Prerequisite: ART 101 or 102.

Fall, alternate years, 3 credits

J. Barnitz

ART 216 Modern Latin American Art

A course in the art of Latin America from Independence to the present with emphasis on the important trends and groups formed since World War II.

Prerequisite: ART 215.

Spring, alternate years, 3 credits

J. Barnitz

ART 217 Pre-Columbian Art

A survey of the artistic forms of pre-Columbian civilizations from archaeological *Olmecs* to the architecture of *Machu Pichu*.

Prerequisite: ART 101 or 102 or 215.

Spring, alternate years, 3 credits

A. Jonaitis

ART 219 Survey of Far Eastern Art

A general course on Far Eastern Art covering India, China and Japan from its beginnings to the present. Emphasis will be on the major arts of painting and sculpture, with some reference to architecture.

Prerequisite: ART 101 or 102.

Spring, alternate years, 3 credits

L. Ting

ART 220 History of Chinese Painting

A study of Chinese painting from its

beginnings to the present, in relation to art theories.

Prerequisite: ART 101 or 102 or 219.

Chinese history or philosophy courses are recommended.

Spring, alternate years, 3 credits

L. Ting

ART 223 Primitive Art

A survey of the arts of the native peoples of Africa, Oceania, Siberia and of the North American Indian. Emphasis will be on the art produced in these areas during the 19-20th centuries.

Prerequisite: ART 101 or 102.

Spring, alternate years, 3 credits

A. Jonaitis

ART 225 Art of the United States

Painting, sculpture and architecture from the American Revolution to modern times. Special emphasis will be placed on John Singleton Copley, the Hudson River School and important individual artists of the 19th and 20th centuries up to World War II.

Prerequisite: ART 102.

Fall, alternate years, 3 credits

G. Berman

ART 241 Art of the 19th Century

The history of painting, sculpture and architecture in the Western world from the late 18th century to 1900. Emphasis will be placed on major artists and movements.

Prerequisite: ART 102.

Fall and spring, 3 credits

G. Berman, C. Lindgren

ART 243 Art of the 20th Century

The major movements and individual artists in 20th century painting and sculpture, including reference to the broader socio-cultural context of art.

Prerequisite: ART 102.

Fall and spring, 3 credits

L. Alloway, G. Berman

ART 244 American Art Since 1947

A survey of painting and sculpture in New York, including abstract expressionism, "hard edge" painting, pop art, minimal art and earthworks.

Prerequisite: ART 102.

Spring, alternate years, 3 credits

L. Alloway

ART 251 Major Artists

A single major artist or architect will be selected. His or her development, works and influence on others will be carefully analyzed through lectures and class discussions. May be repeated once with departmental permission.

Prerequisite: ART 102.

Fall, alternate years, 3 credits

Staff

ART 253 Introduction to the Literature of Art

A selection of writings by artists, critics, art historians and theorists will be analyzed through lectures and class discussion.

Prerequisite: ART 101 or 102.

Fall, alternate years, 3 credits

G. Berman

ART 338 Topics in Art History, Ancient to Modern

A special course offered from time to time by the department, utilizing the unique talents and facilities of the art history/criticism faculty. Topics to be announced. May be repeated once with permission of the departmental advisor.

Prerequisite: At least five courses in art history and permission of instructor.

Fall or Spring, 3 credits

Staff

ART 351, 352 Topics in 20th Century Art

An advanced course for students with a basic familiarity with modern art. It is intended as a detailed study of a single style and, in addition, as an example of the research methods by which art movements are approached. Topic to be announced. May be repeated once with departmental permission.

Prerequisite: ART 243.

Fall and spring, 3 credits each semester

L. Alloway

ART 398 Introduction to Library Research in Art History and Criticism

The student, in consultation with the instructor, selects an art history or art criticism research project requiring fairly extensive library research of moderate difficulty. The course includes individual advising sessions as well as class lectures and discussions designed to familiarize the student with specialized art resources.

Prerequisite. At least three courses in art history/criticism.

Spring, 3 credits

C. Koppelman

ART 399 Independent Reading and Research in Art

A project designed by the student involving reading, research or field work in art, art history, or criticism, conducted under the supervision of a faculty member. The course may be repeated for a maximum of 12 credits.

Prerequisites: At least four courses in art, sponsorship of a faculty member, and permission of departmental chairman.

Fall and spring, 1 to 6 credits

Staff

Studio Art*

ART 111 Introductory Still-Life, Composition, Painting and Drawing

Introducing the student to drawing and painting media and techniques, and to the study of color, perspective and composition.

Prerequisite: None for freshmen. Open to sophomores, juniors and seniors with permission of department.

Fall and spring, 3 credits

J. Bernstein, M. Pusey

ART 112 Figure Drawing and Painting

Studio course stressing drawing and painting from the nude and draped model, and investigating anatomy, foreshortening, and the expressive potential of the figure in the visual arts. ART 111 and 112 may be taken independently of each other.

Prerequisite: None for freshmen. Open to sophomores, juniors and seniors with permission of department.

Fall and spring, 3 credits

J. Bernstein, M. Pekarsky

ART 231, 232 Fundamentals of Sculpture

A course designed to introduce the student of the techniques and formal principles of sculpture.

Prerequisites: ART 101, 102, 111 and 112.

Fall and spring, 3 credits each semester

J. Kleege, G. Koras

ART 233, 234 Intermediate Sculpture

First semester: sculpting involving modeling in clay and other substances, casting in plaster and plastics; carving in wood, stone, and other substances. Second semester: sculpting involving welding and related techniques. ART 233 and 234 may be taken independently of each

other.

Prerequisites: ART 231 and 232.

Fall and spring, 3 credits each semester

J. Kleege, G. Koras

ART 238 Ceramics

Exploration of ceramics techniques; terra cotta sculpture. May be repeated once with permission of instructor.

Prerequisites: ART 111 and 112.

Fall and spring, 3 credits

Staff

ART 247, 248 Intermediate Painting

Painting and drawing for the second-year student stressing individual development and exploration of the media and craft of painting. Studio and discussion. ART 247 and 248 may be taken independently of each other.

Prerequisites: ART 101, 102, 111 and 112.

Fall and spring, 3 credits each semester

E. Countey

ART 255 Photography I

An intensive course with extensive practice and experimentation in the aesthetics, techniques and materials of photography. It will be expected that the student's academic program and/or vocational objectives require a real need for training in photography. Students must provide their own camera and materials.

Prerequisites: Sophomore standing and permission of instructor.

Fall or spring, 3 credits

M. Edelson

ART 256 Photography II

An intermediate level course for those who have mastered basic camera and darkroom techniques and have acquired an understanding of photographic aes-

*See p. 75, Information About Course Credit. Waiver of prerequisites in studio art courses requires permission of both instructor and studio head.

thetics. Further exploration of photography as a means of personal visual expression, along with a continued intensive examination and application of materials and techniques. Students must provide their own camera and materials. Prerequisites: ART 255 or equivalent and permission of instructor after interview and review of portfolio.

Spring, 3 credits

M. Edelson

ART 265 Drawing Studio

Work in all drawing media. May be repeated once with permission of instructor and studio head.

Prerequisites: ART 111 and 112.

Fall and Spring, 3 credits

R. White

ART 271, 272 Fundamentals of Graphic Arts

Exploration of intaglio, relief and planographic printmaking processes. First semester: woodcut and wood engraving, engraving and etching. Second semester: silkscreen and lithography. ART 271 and 272 may be taken independently of each other.

Prerequisites: ART 101, 102, 111 and 112.

Fall and spring, 3 credits each semester

E. Countey, M. Pusey

ART 273, 274 Intermediate Graphics

Increasing development of craft in the graphic arts, with growing emphasis on technical specialization and individual growth as an artist. ART 273 and 274 may be taken independently of each other.

Prerequisites: ART 101, 102, 271 and 272.

Fall and spring, 3 credits each semester

M. Pusey

ART 277 Design Techniques and Graphic Representation

A studio course in the techniques of perspective drawing, isometric projection, multiphase drawings, motion studies, graphics and analytical drawing and their application to a selected project. Air-

brush instruction is available.

Prerequisites: ART 111 and 112.

Fall and spring, 3 credits

J. Kleege

ART 280 Kinetic Art

Introduction to kinetic art techniques with links between art and technological resources. Studio work in these techniques using light, chemical reactions, motorized equipment, lectures and seminars on kinetic art.

Prerequisites: ART 231 or 277.

Fall, 3 credits

L. Lusardi

ART 281 Video as an Art Medium

Video as an art form; the creation of realistic, abstract and impressionistic images in video and audio, using electronic originations.

Prerequisites: ART 265 or 277 or 280 or Theatre 352 or 353.

Spring, 3 credits

L. Lusardi

ART 290 Special Directed Studio Projects

Explorations in studio areas not covered by the core curriculum—for example, crafts or anatomical drawing. The student works under the guidance of a sponsor and is expected to complete a report, portfolio or project. May be repeated up to a limit of 6 credits with permission of sponsor and studio head.

Prerequisites: At least three courses in studio art, sponsorship of a faculty member and approval of studio head.

Fall and spring, 3 credits

ART 328 Directed Studio Projects

Advanced studio projects in the areas of specific interest to the student. The student works independently in the studio under the guidance of a sponsor in the area of concentration, who will criticize and evaluate the student's work. Students will submit a report, portfolio or project to the department upon completion of the course. May be repeated up to a limit of 6 credits with permission

of sponsor and studio head.

Prerequisites: At least five studio courses, sponsorship of a faculty member and approval of studio head.

Fall and spring, 3 credits

ART 366 Photography III

A two-part course dealing first with the photographic studio environment and its unique potential as an additional form of visual expression. The second half is an introduction to color materials and imagery. Concurrent lecture, studio and darkroom. Students must provide their own cameras and materials, but large format cameras will be available for studio work.

Prerequisites: ART 255 and 256 or equivalents and permission of instructor after interview and review of portfolio.

Fall and spring, 3 credits

M. Edelson

ART 367 The Language of Photographic Images

An in-depth study of the varied methods that enable still photography to communicate aesthetically and informatively. Areas to be investigated through individual project assignments include the photo essay, picture story, film strip and various slide/tape presentations. In addition to three hours of lecture per week, there will be a one-hour production workshop. Students must provide their own cameras and materials.

Prerequisites: ART 366 and permission of instructor after interview and review of portfolio.

Fall and spring, 4 credits

M. Edelson

ART 368 Advanced Photography Seminar

Personal projects designed to explore and interpret special interests and viewpoints of the student. Emphasis on long-term, in-depth studies, culminating in a final formal exhibition. In addition to three hours per week of lecture/seminar, there will be a one-hour critique session. Students must provide their own cameras

and materials.

Prerequisites: ART 366 and permission of instructor after interview and review of portfolio.

Fall and spring, 4 credits

M. Edelson

ART 371, 372 Advanced Painting

Painting for the advanced student. Studio and critique. ART 371 and 372 may be taken independently of each other.

Prerequisites: ART 241, 243, 247 and 248 and permission of instructor and studio head.

Fall and spring, 3 credits each semester

M. Pekarsky

ART 385, 386 Advanced Sculpture

First semester: metalwork studio II involving investment casting and sand casting of metals. Second semester: individual development of craft and artistic identity stressed. Advanced study in sculpture may be continued under ART 328. ART 385 and 386 may be taken independently of each other.

Prerequisites: ART 241, 243 and 233 or 234 and permission of instructor and studio head.

Fall and spring, 3 credits each semester

G. Koras

ART 390 Special Topics in Studio

Special courses may be offered from time to time by the department, utilizing the unique talents and facilities of the department faculty and the University environment.

Prerequisites: ART 111, 112, 241 and 243 and permission of instructor and studio head.

3 credits

ART 391, 392 Advanced Graphics

A graphic arts workshop and critique, stressing individual development and refinement of craft for the advanced student or professional artist. ART 391 and 392 may be taken independently of each

other.

Prerequisites: ART 241, 243 and 273 or 274 and permission of instructor and studio head.

Fall and spring, 3 credits each semester

M. Pusey

Interdisciplinary Program in Asian Studies

Program Chairman: Robert H. G. Lee (History)

Faculty Advisory Committee: Anthropology—David Hicks, Art—Louisa Shen Ting, Chinese—Shi Ming Hu, Economics—Charles Hoffmann, Edward Van Roy, History—Yasuo Sakata, Philosophy—Antonio deNicolas, David A. Dilworth, Theatre—William J. Bruehl

A minor program in Asian Studies is being developed for the near future. It is designed to provide students with a broad knowledge of Asian cultures and civilizations. Interested students are directed to the courses listed below:

ANT 206 *Peoples of Asia*
ANT 211 *Peoples of Southeast Asia and Indonesia*
ANT 213 *China: The Social and Cultural Background*
ART 219 *Survey of Far Eastern Art*
ART 220 *History of Chinese Painting*
CHI 111, 112 *Elementary Chinese*
CHI 151, 152 *Intermediate Chinese*
CHI 221, 222 *Advanced Chinese*
ECO 284 *Topics in Area Studies (Asia)*
ECO 330 *Economic Anthropology*
HIS 197 *Chinese Civilization*
HIS 198 *Modern China*
HIS 261 *Intellectual History of China*
HIS 262 *Chinese Communism*
HIS 265 *Japan Before the Modern Era*
HIS 266 *Modern Japan, 1868—Present*
HIS 267 *East Asian-U.S. Relations*
HIS 299 *Independent Readings in History*
HIS 362, 363, 364 *Topics in Asian History*
HIS 461 *Colloquium in Asian History*
PHI 210 *Introduction to Indian Philosophy: Classical Texts*
PHI 211 *Introduction to Indian Philosophy: Philosophical Schools*

PHI 212 *Introduction to Chinese Philosophy*
PHI 238 *Indian Buddhism: Its Essence and Development*
PHI 239 *Chinese and Japanese Buddhism*
PHI 307, 308 *Japanese Philosophy and Aesthetics*
THR 254 *Asian Theatre*

ANS 391 Senior Seminar in Asian Studies

This interdisciplinary seminar will bring together faculty members and students to discuss and do research on various problems of current interest in the field of Asian studies, including such topics as agrarian unrest, nationalism, regional economic integration, problems of modernization, industrialization, historical continuity and discontinuity and comparative aesthetics. A single topic will be discussed each semester which could be repeated the next semester. A seminar director will be responsible for the selection of the topic and the faculty participants.

Fall and spring, 3 credits

Division of Biological Sciences

Divisional Head: Leland N. Edmunds, Jr.

Department of Biochemistry

Professors: Vincent P. Cirillo, Masayori Inouye, Monica Riley, Richard Setlow (*Adjunct*), Elliott N. Shaw (*Adjunct*), Melvin V. Simpson, F. William Studier (*Adjunct*)

Associate Professors: Norman Arnheim, Jr., Bernard S. Dudock, Martin Freundlich (*Acting Chairman*), Raymond Gesteland (*Adjunct*), Carl Moos, Sanford R. Simon, Rolf Sternglanz

Assistant Professors: Raghupathy Sarma, Carl Scandella, Jakob Schmidt

Department of Cellular and Comparative Biology

Distinguished Professor Emeritus: H. Bentley Glass

Distinguished Teaching Professor: Elof Axel Carlson

Professors: Frank C. Erk, William S. Hillman (*Adjunct*), Raymond F. Jones, Emil Menzel, Jr., F. C. Steward (*Adjunct*), Charles Walcott (*Chairman*)

Associate Professors: Edwin H. Battley, Albert D. Carlson, Eugene R. Katz, Abraham D. Krikorian, Charles M. Lent, Harvard Lyman, Robert W. Merriam, Bernard D. Tunik

Assistant Professors: James A. Fowler, Kenneth D. Laser, Elizabeth J. Mallon, Barry A. Palevitz, Dominic L. Poccia, Douglas G. Smith, Stephen Yazulla

Department of Ecology and Evolution

Professors: ^aF. James Rohlf (*Chairman*), Howard L. Sanders (*Adjunct*), Lawrence B. Slobodkin, Robert R. Sokal, George C. Williams

Associate Professors: James S. Farris, George J. Hechtel, ^aRichard K. Koehn, ^aJeffrey S. Levinton, Robert E. Smolker, John R. G. Turner

^aOn leave.

Assistant Professors: Barbara L. Bentley, C. Ronald Carroll (*Visiting*), Douglas J. Futuyma

Faculty Holding Joint Appointments:

Professors: Edward R. Baylor

Associate Professors: Charles F. Wurster, Jr.

Programs in the Biological Sciences

The division of biological sciences sponsors programs in two undergraduate majors, biochemistry (BCH) and biological sciences (BIO).

The undergraduate program in biochemistry is designed to provide an introduction to the chemical basis of biological phenomena. The student is prepared primarily for graduate study in biochemistry or other biological sciences and for professional study in the health sciences. The program is based on a core of introductory courses in biology, chemistry and biochemistry, with pertinent courses in mathematics and physics.

The undergraduate program in biological sciences is designed to provide an introduction to the principles and methodology of the biological sciences. The student can prepare for graduate study, for professional study in the health sciences, for secondary school teaching and for certain positions in industry and research.

Requirements for the Biochemistry Major

In addition to the general University requirements for the Bachelor of Science degree, the following courses are required for the major in biochemistry:

A. *Study within the areas of biology/biochemistry and chemistry*

1. Biology and biochemistry
BIO 141 General Genetics
BIO 154 Cell Biology and Chemistry
BIO 162 Cell Biology and Biochemistry Laboratory
BIO 361 Biochemistry

At least two additional courses must be chosen by the student, in consultation with the adviser, from among the following courses: BIO 298 and 299 (counts as one course), BIO 313, 363 (described in this *Bulletin*) or BMO 502, 505, 506, 508, 513, 514, 515 (described in the *Graduate Bulletin*)

2. Chemistry
CHE 101, 102 or 103, 104 General Chemistry or Honors Chemistry
CHE 105, 106 or 109, 110 General Chemistry Laboratory or

Honors Chemistry Laboratory
CHE 153, 154 Physical Chemistry I, II
CHE 201, 202 or 211, 212 Organic Chemistry
CHE 203, 204 or 207 Organic Chemistry Laboratory

(Note: Students planning to continue in biochemistry beyond the undergraduate level should choose CHE 203, 204 and should, wherever other alternatives appear above, take the courses designed for chemistry majors. Premedical students and others who do not intend to continue in biochemistry may substitute CHE 207.)

B. *Courses in related fields*

MSM 121, 122 Calculus I, II and *either* MSM 151 or
153 Calculus III

MSA 104 Introduction to Probability

PHY 101, 102 General Physics, I, II

PHY 151 General Dynamics III or CHE 315 Intermediate Organic
Chemistry or CHE 255 Introduction to Quantum Chemistry

(Note: PHY 103, 104 may be substituted for PHY 101, 102 only
with special permission of the biochemistry departmental under-
graduate curriculum committee.)

C. *Selection of electives*

1. All biochemistry majors, especially those interested in the physical aspects of biochemistry and/or in the mechanism of enzyme action, should consider taking one or more of the following courses: CHE 155 Solution Chemistry Laboratory, CHE 255 Introduction to Quantum Chemistry, CHE 256 Statistical Thermodynamics and Kinetics, CHE 258 Molecular Structure and Spectroscopy Laboratory, CHE 315 Intermediate Organic Chemistry, CHE 325 Quantum Mechanics and Spectroscopy, MSM 152 Calculus IV and MSI 201 Advanced Calculus for Scientists I.
2. A course in computer science such as MSC 101 Introduction to Computer Science is highly recommended.
3. Students planning graduate or professional studies should obtain information on specific requirements of particular schools and programs. Requirements for doctoral programs in the biological sciences usually include a reading knowledge of one or two approved languages. Preparation in languages should be completed as part of the undergraduate program.

D. *Changes in program*

With the consent of an advisor, a student may petition the undergraduate studies committee in biochemistry for permission to change requirements of the major.

Honors Program in Biochemistry

Departmental majors with a grade point average of 3.0 or better in courses listed in A, B and C above are eligible to apply for the honors program, and should do so before the beginning of their senior year. The student must find a member of the faculty of the department to act as research advisor and must obtain formal permission from the department to enter the honors program.

Honors students must be enrolled in BIO 298, 299 Research Project. The basic requirement for honors is completion of a senior thesis based upon research performed during the senior year. Three copies of the completed thesis or report must be submitted to the student's research advisor no later than 21 days before the date of graduation. One copy will be returned to the student, one copy will remain with the sponsor, and the third will be placed on file in the department.

Conferral of honors is contingent upon the recommendation of a reading committee consisting of the research advisor, another member of the department, and a faculty member from another department in a related field. In addition, the student must maintain a grade point average of 3.0 in all courses taken in the senior year which are listed in A, B or C above.

Requirements for the Biological Sciences Major

In addition to the general University requirements for the Bachelor of Science degree, the following program must be completed for the Divisional major in Biological Sciences. All courses offered for the major must be taken for a letter grade.

A. Study within Biology

At least 30 credits in biology, which must include Principles of Biology (BIO 109, 110) or approved equivalents at previous schools, and fulfillment of the following distribution requirements.

At least one lecture or seminar course in four of the five emphasized areas (I—V) of biological inquiry, as listed below, and a second lecture or seminar course in one of them. (The laboratory-only courses marked with an asterisk do not meet this requirement.) Tutorial readings (BIO 293, 294) do not meet this requirement unless explicitly authorized by the Divisional Undergraduate Studies Committee.

A laboratory course, or course with included laboratory, in two of the four chosen areas. Research projects, such as BIO 298, 299, do not fulfill this requirement, unless explicitly authorized by the Divisional Undergraduate Studies Committee.

Course Lists, Areas of Inquiry

Area I Cell Biology and Biochemistry—BIO 154, 162*, 313, 361, 363, 392.

Area II Genetics and Development—BIO 141, 161*, 250, 251, 270, 310, 393.

Area III Physiology and Behavior—BIO 182, 201, 203*, 280, 281, 282, 351, 380, 383, 384; HBY 302.

Area IV Organisms—BIO 145, 237, 238, 271, 272, 308, 309, 334.

Area V Ecology and Evolution—BIO 152, 338, 342, 344*, 372, 387, 389*, BIO 317, INT 302.

Notes on Section A

1. Non-major courses (BIO 101, 102, 111, 113) and teacher preparation courses (BIO 199, 200, 295, 300, 301, 350) do not satisfy Section A requirements.

2. Research courses, such as BIO 298, 299, may be used for a maximum of 8 credits; and tutorial readings, such as BIO 293, 294, for a maximum of 2 credits; and INT 302 for a maximum of 8 credits toward the 30 credit requirement of Section A.

3. ISP research projects, and health science research/readings projects do not meet Section A requirements, unless explicitly approved by the Divisional Undergraduate Studies Committee.

4. Transfer students must take at least 15 of the 30 Section A credits and at least one of the two laboratory experiences at Stony Brook. Courses taken elsewhere meet area requirements *only* when explicitly authorized by the Divisional transfer evaluator.

5. Aside from area requirements, electives may be chosen from any biology course for majors or from a diverse list of approved courses given by other departments (see advisors for list).

B. Courses required in related fields

1. Chemistry and Physics

One year of introductory chemistry with laboratory:

CHE 101, 102 or 103, 104 and CHE 105, 106 or 109, 110.
(Students completing CHE 123, 124 are exempted from CHE 101)

One year of organic chemistry, with one semester of laboratory

CHE 201, 202 or 211, 212 and CHE 203 or 207

One year of physics with laboratory:

PHY 103, 104 or 101, 102

2. Mathematics

MSM 121 Calculus I and any of the following alternatives:

MSM 122 + MSA 104; or MSM 123; or MSA 110

Additional mathematics is recommended for many areas of research (for example, MSA 145).

C. Curriculum Planning

1. Students are strongly urged to consult with faculty advisors in planning programs and specific course schedules. The divisional office (Rm. 112, Graduate Biology Bldg.) maintains a list of general and specialized advisors.
2. The Divisional Undergraduate Studies Committee reviews transfer evaluation problems and considers petitions for alterations of major requirements. The USC can be contacted through the divisional office.
3. Students planning graduate or professional studies should obtain information on specific requirements of particular schools and programs. Students interested in health professions, including medicine, should contact the Health Professions Office.
4. Requirements for doctoral programs in the biological sciences usually require a reading knowledge of one or two approved foreign languages. A knowledge of computer techniques is increasingly valuable.

Biology Teacher Preparation Program

This program is designed for the biology major who is preparing to teach in the junior or senior high school. It includes observational experiences in biology classrooms, practice using various biology curricula, study of adolescent psychology, a laboratory oriented methods course, a student teaching experience and a seminar to help solve student teaching problems.

The normal course sequence leading to certification is: BIO 199, a course in adolescent growth and development, BIO 200, BIO 300, BIO 301, BIO 350. These courses are in addition to those required of biology majors.

Honors Program and Independent Study in Biological Sciences

Divisional majors with a grade point average of 3.0 or better in courses in the Biological Sciences and related fields (see A and B above) are eligible to apply for candidacy in the Honors Program. The student must find a member of the faculty of the Division to act as a sponsor, and a faculty co-sponsor not necessarily a member of the Division. The student must prepare a research proposal in consultation with them and submit it, with their approval, to the Curriculum Committee of the Division, requesting admission to Honors candidacy. This request should normally be made in the semester preceding the one during which the Honors research will begin. No request for admission to Honors candidacy will be considered after the end of the add period of the semester during which the Honors research will begin.

Admission to Honors candidacy will be contingent on the nature and quality of the proposal. An interview with the Curriculum Committee of the Division may be required.

Honors students are normally enrolled in BIO 298, 299. Alternatively, students may request admission to Honors candidacy by submitting their Independent Study proposal to the Curriculum Committee of the Division.

The applicant will be notified of the action of the Curriculum Committee of the Division, which, in the event that candidacy is approved, will appoint a Reading Committee consisting of the sponsor, the co-sponsor and an outside reader.

On completion of the research, but no later than 35 days before the end of the last semester of Honors Research, three copies of a report of the work (the completed thesis) must be submitted to the Reading Committee. The candidate will then give a public oral report of his or her work within two weeks thereafter.

Conferral of Honors is contingent on the recommendation of the Reading Committee and maintenance of a grade point average of not less than 3.4 in all biological sciences and related courses taken during the Honors year.

Students planning a program of Independent Study in the biological sciences must have their proposal approved by their sponsors and the Curriculum Committee of the Division before submission to the Arts and Sciences Curriculum Committee.

Courses*

BIO 101, 102 Biology: a Humanities Approach

The major concepts of biology are presented from historical, contemporary and critical viewpoints. These concepts include the cell, the gene, molecular biology, development and evolution. The human implications or values associated with each concept are emphasized. Three hours of lecture each week. Primarily intended for non-biology majors.

Prerequisite to BIO 102: BIO 101.

Fall (101) and spring (102), 3 credits each semester

E. Carlson and staff

BIO 109, 110 Principles of Biology

Aspects of structure, function, adaptation and evolution in cells and organisms. BIO 109 concentrates on the diversity of organisms and their interactions within ecosystems. BIO 110 emphasizes the biology of the cell and the integration of cellular activity within organisms. Directed toward prospective biology majors.

Three hours lecture, three hours laboratory.

Prerequisite: High school biology and chemistry are assumed. BIO 109, 110 can be begun with either semester.

Fall and spring, 4 credits each semester

BIO 111 Genetics and Man

A general introduction to genetics, with special attention to its importance in medicine, agriculture and other aspects of human life and culture. For students not majoring in the biological sciences. Three hours of lectures or discussion.

Spring, 3 credits

F. Erk

BIO 113 General Ecology

Designed to provide a sense of the problems of modern ecology. Population growth and regulation, interspecific interactions in natural communities and the concept of the balance of nature will be analyzed. The mutual relation between human activities and ecology will be dis-

*See p. 75, Information About Course Credit.

cussed. Mathematics is not a prerequisite but might prove helpful. Three hours of lectures per week. For students not majoring in biological sciences.

Fall, 3 credits

L. Slobodkin

BIO 141 General Genetics

An introductory course in genetics for biology majors. General areas to be discussed include transmission genetics, cytogenetics, immunogenetics, molecular genetics, population genetics and quantitative genetics.

Prerequisite: BIO 109, 110

Prerequisite or corequisite: CHE 101 or 103 or 123, 124.

Fall, 3 credits

E. Katz

BIO 145 Plants and Man

An introduction to the origin, structure and growth of the higher plant body as a basis for understanding the broader principles of plant biology, as well as the relations of plants to human life. Economically important plants and their products, especially as sources of food, shelter, clothing, drugs and industrial raw materials are stressed. Current problems in agriculture, plant industry, medicine, use, conservation and appreciation of plants are included.

Prerequisites: BIO 109, 110, CHE 101, 102 or equivalent.

Fall, 3 credits

A. Krikorian

BIO 152 Adaptation and Evolution

Studies of adaptation in organisms, community dynamics, ecology and the theory of evolution.

Prerequisites: BIO 141; MSM 121 recommended.

Fall, 3 credits

B. Bentley, J. Turner

BIO 154 Cell Biology and Chemistry

The cell is studied as the unit of structure, biochemical activity, genetic control and differentiation. The principles of biochemistry and genetics are applied to

an understanding of nutrition, growth and development.

Prerequisites: BIO 109, 110, CHE 102 or 104 and CHE 201 or 211.

Spring, 3 credits

B. Dudock, H. Lyman

BIO 159 History of Biology

A thorough examination of selected topics in the history of biology: for example, Darwinism, development of taxonomy, origins of cell theory, preformation-epigenesis controversy, development of biochemical biology. Three hours of lectures or discussions. This course is identical with HIS 259.

Prerequisites: BIO 141, 154.

Fall, 3 credits

R. Cowan

BIO 161 Genetics Laboratory

Representative exercises and experiments that explore genetic phenomena such as mutation, recombination and gene action in several organisms. Some work in cytogenetics and population genetics is included. One three-hour laboratory and one hour of discussion per week.

Prerequisites: BIO 141, 154.

Fall, 2 credits

BIO 162 Cell Biology and Biochemistry Laboratory

A series of laboratory experiments and discussions designed to complement BIO 154. Topics covered will include cytological techniques and localization of cellular components, extraction and characterization of nucleic acids and enzymes, isolation of cellular organelles, osmosis and permeability, bioenergetics and cell cycle control. Four hours of laboratory and discussion per week.

Prerequisite or corequisite: BIO 154.

Spring, 2 credits

M. Inouye

BIO 182 Animal Physiology

The basic principles of vertebrate physiology. The general processes of circulation, respiration, nutrition, excretion, and their control by the nervous and endocrine systems, sensation, and coordina-

tion will be emphasized. Students may not receive credit for this course if they have passed either HBA 300 or HBY 350. Prerequisites: BIO 109, 110 and CHE 101 or 103 or 123, 124.

Spring, 3 credits

C. Walcott, W. van der Kloot

BIO 199 Clinical Observation Experience

Observation of classroom activities in public, junior and senior high school biology classrooms. Participation in teaching related activities. Opportunity for familiarization with teaching profession. Three hours in public schools and one class meeting per week. Not for major credit.

Prerequisite: BIO 109, 110.

Fall, 2 credits

BIO 200 Curricula in the Biological Sciences

Exhaustive analysis of all curricula used in the teaching of biology to secondary school students. Texts, manuals, audiovisual materials and laboratory programs are studied. Approaches to biology instruction are discussed and practiced by students. Practical experiences with some curricula in public schools are provided for. Two hours of lecture and discussion and one three-hour laboratory per week. Not for major credit.

Prerequisite: BIO 199.

Spring, 3 credits

BIO 201 Physiology of Cells and Tissues

Fundamental physiological functions of the cells and tissues of higher organisms, such as excitability and bioelectric phenomena, membrane selectivity, active transport, and contractility, are discussed from the point of view of their cellular and molecular mechanisms. Three hours of lecture per week.

Prerequisites: BIO 154 and BIO 182.

Prerequisite or corequisite: PHY 101 or 103.

Fall, 3 credits

C. Moos

BIO 203 General and Comparative Physiology Laboratory

An analytical approach to selected topics, including active transport, bioelectric potentials, receptor and effector organs, and neural and hormonal regulatory mechanisms. Students will contribute to the selection of topics and will design the experiments.

Prerequisite: BIO 182 or 201 or 280 or 281.

Spring, 2 credits

B. Tunik

BIO 237 Invertebrate Zoology

An introduction to the diversity, comparative and functional morphology, natural history and evolution of invertebrates, with interest centered on the modern fauna. Three hours of lectures or discussions and one three-hour laboratory per week.

Prerequisite: BIO 109, 110 or ESS 106.

Fall, 4 credits

G. Hechtel

BIO 238 Chordate Zoology

An introduction to the diversity, comparative and functional morphology, natural history and evolution of chordates, with interest centered on the modern fauna. Three hours of lectures or discussions and one three and one-half hour laboratory each week.

Prerequisite: BIO 109, 110.

Spring, 4 credits

R. Smolker

BIO 250 Animal Embryology

A survey of the developmental anatomy of vertebrates. Laboratory exercises consist of the study of embryonic development from sectioned material and whole embryos of selected vertebrates. Lectures and readings cover the principal developmental sequences and some of the important experimental analyses of these processes.

Prerequisite: BIO 109, 110.

Fall, 4 credits

J. Fowler

BIO 251 Animal Development

An introductory analysis of the development of form and function in animals, emphasizing the experimental evidence underlying general principles. Topics covered include differentiation, determination, polarity, induction, nucleocytoplasmic interactions, cytostructure. Laboratory work will consist of experiments on live invertebrate organisms.

Prerequisites: BIO 145 and CHE 201 or
Spring, 4 credits

D. Poccia

BIO 270 Plant Form and Function

An examination of plant structure and development as it relates to function and environment. The subject will be traced from the subcellular level to the complete organism with an analysis of organelles, cell types, and tissues, plant hormones and growth responses.

Prerequisites: BIO 145 and CHE 201 or 211.

Spring, 3 credits

B. Palevitz, A. Krikorian

BIO 271 Biology of the Non-Vascular Plants

An introduction to the biology of the bacteria, fungi, algae, hornworts, liverworts and mosses. The course will include considerations of the morphologies, physiologies, and biochemistry of each of these groups. Three hours of lecture and discussion per week. Students may not receive credit for this course if they have passed BIO 143.

Prerequisite: BIO 154.

Fall, 3 credits

E. Battley

BIO 272 Comparative Morphology of Vascular Plants

A survey of the vascular plants studying their structure and development of vegetative and reproductive organs and life histories with emphasis on the comparative anatomy, morphology and evolutionary relationships of vascular cryp-

togams, cycads, ginkgo, gymnosperms and angiosperms.

Prerequisite: BIO 145 or 270 or 271.

Spring, 3 credits

K. Laser

BIO 280 Comparative Physiology

An introduction to the physiological adaptations of various animal species to environmental variables. Emphasis is placed upon homeostatic mechanisms at the organismic level.

Prerequisite: BIO 182.

Fall, 3 credits

C. Lent

BIO 281 Principles of Neurophysiology (Formerly BIO 381)

The ionic basis of nerve potentials, the physiology of synapses and the comparative physiology of sense organs and effectors will be discussed. Consideration will also be given to the integrative action of the nervous system.

Prerequisite: BIO 182.

Fall, 3 credits

A. Carlson

BIO 282 Principles of Behavior (Formerly BIO 382)

An introduction to the study of animal behavior including a consideration of current research in the field. Three hours of lectures or discussions per week.

Prerequisite: BIO 182.

Spring, 3 credits

D. Smith, C. Walcott

BIO 293, 294 Special Topics from the Biological Literature

Tutorial reading in the biological sciences. This course may be repeated but not more than 2 credits may be used toward the divisional major requirements.

Prerequisites: Student must have the consent of the faculty member who will supervise the work as well as the permission of the division.

Fall (293) and spring (294), 1 credit each semester

BIO 295 Teaching Practicum in College Biology

Study of the literature, resources and teaching strategies in a field of biology, coordinated with a supervised clinical experience in instruction. Not for major credit. Cannot be repeated for credit.

Prerequisites: Junior status, permission of instructor, and approval of the Undergraduate Studies Committee.

Fall and spring, 3 credits each semester

BIO 298, 299 Research Project

In this course the student will work under the supervision of a faculty member in developing an individual project making use of the knowledge and techniques acquired in previous courses. The student will prepare an appropriate report on the project. The course may be taken more than two semesters, but no more than eight credits may be utilized for divisional major requirements.

Prerequisites: Permission of instructor and of division.

Fall (298) and spring (299), 2 to 4 credits each semester

BIO 300 Instructional Strategies and Techniques

This course is third in a series for prospective secondary school teachers of biology. It emphasizes instructional strategies and techniques necessary to create and implement inquiry and discovery activities of an investigative nature. Laboratory skills, preparations, life support systems for organisms, question-asking strategies and a humanistic approach to teaching are stressed. Two hours of discussion or lecture and one three-hour laboratory per week. Not for major credit.

Prerequisite: BIO 200.

Fall and spring, 3 credits

K. Laser

BIO 301 Supervised Teaching—Biology

Prospective biology teachers at the secondary school level receive extensive practice under selected cooperating teachers. Student teachers work with one or two certified biology teachers in one school each regular school day for the

entire semester. Frequent consultations with the University faculty members are designed to assist the student. Applications must be filed with the Biology Teacher Preparation Program two months prior to student teaching. Not for major credit.

Prerequisite: Senior standing and approval of the Teacher Selection Committee.

Corequisite: BIO 350.

Fall and spring, 12 credits

BIO 305 Statistics for Biologists

An introductory statistics course for students in all areas of biology. Normal statistics to analysis of variance, regression analyses and transformations. Non-parametric tests and chi-square testing. Properties of distributions and tests of fit to distributions. Fundamentals of probability theory, statistical decision theory and the concept of statistical inference. Three hours of lectures or discussions per week.

Prerequisite: Completion of one of the required mathematics options.

Fall, 3 credits

J. Farris

BIO 308 Advanced Invertebrate Zoology

Lectures and student seminars on selected aspects of invertebrate adaptations and evolution. Alternative semester topics are radiate invertebrates, mollusks, and protostomes. May be repeated as topics change.

Prerequisite: BIO 237.

Spring, 2 credits

G. Hechtel

BIO 309 Insect Systematics and Ecology

This course covers the higher systematics, behavior, physiology and ecology of insects. The emphasis in the course is on interpreting the material in an ecological context. Three lectures and one laboratory period per week plus three weekend trips and a student project are required.

Prerequisite: BIO 152.

Fall, 4 credits

BIO 310 Developmental Genetics

The genetic analysis of developmental events in higher organisms. Two hours of lectures and discussion per week.

Prerequisites: BIO 141 and 154.

Fall, 2 credits

F. Erk

BIO 313 Molecular Genetics

The molecular bases of recombinations, mutation, replication and gene expression are studied. The genetics of microorganisms is presented, and the experimental support for molecular models of basic genetic phenomena is examined. Three hours of lectures and discussion per week.

Prerequisites: BIO 141 and 154.

Fall, 3 credits

M. Riley

BIO 317 Marine Ecology

A survey of biotic responses to ecological challenges in different marine realms. Controls of diversity and trophic structure in the marine ecosystem, historical aspects of marine realms, productivity in the oceans, plankton, soft-bottom communities, inter-tidal habitats, coral reefs, deep sea environments and effects of pollution in the ocean will be discussed. Three one-hour lectures per week. This course is identical with ESS 317.

Prerequisite: BIO 237.

Spring, 3 credits

J. Levinton

BIO 331 Oceanography for Biologists

Introduction to physical and chemical aspects of the marine environment.

Prerequisite: BIO 237 or 238.

Corequisite: BIO 334 or BIO 338.

Spring, 1 credit

G. Williams

BIO 334 Marine Vertebrate Zoology

Ecology, systematics and evolution of marine fishes, and brief treatment of marine representatives of other vertebrate

classes. Two hours of lectures or discussions per week.

Prerequisite: BIO 238.

Prerequisite or corequisite: BIO 331.

Spring, 2 credits

G. Williams

BIO 338 Marine Planktonology

Ecology of coastal and estuarine plankton; trophic relations, seasonal and geographic succession, zooplankton behavior, evolutionary significance of meroplankton. Two hours of lectures or discussions per week.

Prerequisite: BIO 237.

Prerequisite or corequisite: BIO 331.

Spring, 2 credits

G. Williams

BIO 342 Ecology of Land Plants

Lectures and discussions on ecological phenomena and problems important to plants and plant communities including such areas as physiological processes, competitive interactions, plant-animal interactions, and community dynamics. Three lectures per week.

Prerequisite: BIO 152. (Highly recommended: BIO 387.)

Fall, 3 credits

B. Bentley

BIO 344 Plant Ecology Laboratory

Individual and group field projects and two weekend field trips designed to supplement the concepts presented in BIO 342.

Prerequisite: Permission of instructor.

Corequisite: 342.

Fall, 2 credits

B. Bentley

BIO 350 Student Teaching Seminar

Seminar on problems encountered by student teachers and public school teachers at the secondary level. Study and analysis of the many aspects of the teaching profession, such as legal responsibilities, morality and professional ethics, drug abuse program included.

Corequisite: BIO 301.

Fall and spring, 3 credits

BIO 351 General Plant Physiology

This course will emphasize the physiological patterns and integration of cellular processes that culminate in plant growth. Three hours of lectures or discussions per week.

Prerequisites: BIO 154, BIO 270 and CHE 201 or 211.

Fall, 3 credits

A. Krikorian

BIO 361 Biochemistry

A survey of the structure of the major chemical constituents of the cell including carbohydrates, lipids, nucleic acids and proteins. Emphasis will be placed on enzyme structure, enzyme kinetics, reaction mechanisms including the role of coenzymes, metabolic pathways of biosynthesis and degradation involved in cellular activity. Four hours of lecture or discussions per week.

Prerequisites: CHE 201, 202; BIO 154 recommended.

Fall, 4 credits

Staff

BIO 363 Protein and Nucleic Acid Biosynthesis

Nucleic acid replication and transcription, both *in vivo* and *in vitro* are considered in detail. The machinery of protein synthesis including amino acid activation, transfer RNA, ribosomes, the genetic code and the peptide chain initiation, elongation and termination are also covered. Four hours of lectures or discussions a week.

Prerequisite: BIO 313 and 361.

Spring, 4 credits

R. Sternglanz

BIO 372 Evolution

A detailed discussion of the mechanisms of evolution, focusing on the ways in which genetic changes in populations lead to adaptation, speciation and historical patterns of evolutionary change.

Prerequisites: BIO 141, 152 and completion of divisional mathematics requirement.

Spring, 3 credits

D. Futuyma

BIO 380 Sensory Processes

Comprehensive coverage of major and minor sensory systems, with emphasis on the integration of anatomical, physiological and behavioral data. Sensory systems to be covered include vision, audition, somesthesia, the chemical senses, kinesthesia, vestibular and visceral sensation.

Prerequisite: BIO 281 or PSY 340.

Spring, 3 credits

S. Yazulla

BIO 383 Behavior and Evolution

Natural selection as the major force in shaping behavior will be the primary focus of this course. Invertebrate and vertebrate behavior will be discussed, but the main emphasis will be on vertebrate social systems. Three hours of discussions or lectures per week.

Prerequisites: BIO 282 and permission of instructor.

Fall, 3 credits

D. Smith

BIO 384 Biological Clocks

A consideration of the temporal dimension of biological organization and of periodic phenomena which are a basic property of living systems. Topics include a survey of circadian rhythms; influence of light, temperature, and chemicals; use of the clock for adjustment to diurnal, tidal, and lunar cycles, for direction finding (homing and orientation) and for day-length measurement (photoperiodism); breakdown of circadian organization; possible molecular mechanisms of the clock. Three hours per week of lecture, discussion, and reports.

Prerequisites: BIO 154 and CHE 202 or 212 and at least one course in physiology and permission of instructor.

Spring, 3 credits

L. Edmunds

BIO 387 Ecology

An examination of the interactions of living organisms with their physical and biological environments. Special attention is given to population dynamics and

the interactions among organisms that determine the structure, function and evolutionary development of biological communities.

Prerequisites: BIO 152 and completion of divisional mathematics requirement.

Fall, 3 credits

D. Futuyma

BIO 389 Ecology Laboratory

Investigation of the application of general ecological principles to specific populations and communities.

Prerequisite or corequisite: BIO 387.

Fall, 2 credits

D. Futuyma

BIO 392 Seminar in Molecular and Cellular Biology

A series of reports on current research, with particular reference to research work in progress within the department. One hour of lecture and one hour of discussion per week.

Prerequisite: BIO 154.

Spring, 2 credits

C. Scandella

BIO 393 Seminar in Developmental Biology

Lecture-discussion groups of no more than 15 students will seek to formulate the most important problems about developmental events and their control mechanisms at the molecular level. The problems of sex cell formation; the events of fertilization, the ways in which cell division, chromosome transcription and protein synthesis contribute to embryogenesis and regeneration are considered.

Prerequisite: BIO 154 or BIO 250 or BIO 251.

Fall, 2 credits

BIO 394, 395 Special Seminars in Biology

Discussions of a specific area of current interest in biology. The work of each semester covers a different area of biology. Two hours of discussion each week. May be repeated.

Prerequisites: Junior status and permission of instructor.

Fall (394), and spring (395), 2 credits each semester

Staff

Department of Chemistry

Professors: John M. Alexander, Francis Bonner, Benjamin Chu, Harold L. Friedman (*Chairman*), Albert Haim, Noboru Hirota, George Jeffrey (*Adjunct*), Francis Johnson, Edward M. Kosower (*Adjunct*), Paul C. Lauterbur, William J. leNoble, Yoshi Okaya, Richard N. Porter, Fausto Ramirez, Sei Sujishi, Jerry L. Whitten

Associate Professors: Lawrence Altman, Jimmie D. Doll, Frank W. Fowler, Theodore D. Goldfarb, David M. Hanson, Philip M. Johnson, Robert C. Kerber, Allen Krantz, Robert F. Schneider, Charles S. Springer, Jr., David W. Weiser, Arnold Wishnia

Assistant Professors: Paul Helquist, Joseph Lauher, Alan Levy, Dale M. McDaniel, Shu-I-Tu

Coordinator of Undergraduate Studies: R. C. Kerber

Director of Chemical Laboratories: John G. Funkhouser

Coordinator of General Chemistry Laboratories and Lecturer: James W. Hagen

Coordinator of Organic Chemistry Laboratories and Lecturer: Marjorie Kandel

The Bachelor of Science program in chemistry is designed to prepare the student for graduate study in chemistry or for industrial or other employment. The program of the Department of Chemistry is approved by the Committee on Professional Training of the American Chemical Society.

The Bachelor of Arts program allows more flexibility in the choice of electives. It is designed to accommodate the needs of students preparing to teach chemistry in secondary schools, pre-medical students, and others whose career objectives may call for a substantial introduction to chemistry. It can also accommodate students who wish to obtain a strong undergraduate background in another science or mathematics while earning a degree in chemistry.

Students interested in combining the study of Chemistry with the study of materials science should see also the Interdisciplinary Program in Engineering Chemistry.

All students who major in chemistry are urged to take at least 30 credits in the general areas of humanities and social sciences. All courses required for the major must be taken on a letter-grade basis.

Requirements for the Bachelor of Science Degree in Chemistry

In addition to the general University requirements for the Bachelor of Science degree, the following courses are required.

A. Study within the area of chemistry

CHE 101, 102, or 103, 104 Introductory Chemistry

CHE 105, 106 or 109, 110 Introductory Chemistry Laboratory

CHE 153, 154 Physical Chemistry (or 158, 154 with permission of department)

CHE 155 Solution Chemistry Laboratory

CHE 156 Transport Properties and Thermodynamics Laboratory

CHE 201, 202 or 211, 212 Organic Chemistry

CHE 203, 204 Organic Chemistry Laboratory

CHE 255 Introduction to Quantum Chemistry

CHE 258 Molecular Structure and Spectroscopy Laboratory

CHE 305 Inorganic Chemistry I

B. Courses in related fields

1. MSM 121 (Tracks A or B), 122, 151, 152 Calculus I, II, III, IV. The sequence MSM 191-194 may be substituted.
2. Three semesters of physics (preferably PHY 101, 102, 151).

For those students who plan to pursue postcollege studies in chemistry it is recommended that a reading knowledge be attained in German and in French or Russian.

Students who wish to meet the American Chemical Society certification requirements must take, in addition to the above requirements, CHE 257 and one additional advanced chemistry course. Experience in statistics and computer science is highly recommended by the ACS.

Requirements for the Bachelor of Arts Degree in Chemistry

In addition to the general University requirements for the Bachelor of Arts degree, the following courses are required:

A. *Study within the area of chemistry*

- CHE 101, 102 or 103, 104 Introductory Chemistry
- CHE 105, 106 or 109, 110 Introductory Chemistry Laboratory
- CHE 153 or 158 Physical Chemistry
- CHE 155 Solution Chemistry Laboratory
- CHE 201, 202 or 211, 212 Organic Chemistry
- CHE 203 and 204, or 207 and one additional CHE Laboratory course
- CHE 255 Introduction to Quantum Chemistry
- CHE 305 Inorganic Chemistry I

B. *Courses in related fields*

1. MSM 121, 122, 151 Calculus I, II, III. The sequence MSM 191-193 may be substituted.
2. Three semesters of physics (preferably PHY 101, 102, 151).

Preparation for Teachers of Chemistry in Secondary Schools

Curricula leading to provisional certification in chemistry for secondary school teachers are available from the Department of Chemistry.

Honors Program in Chemistry

Students who have maintained a minimum cumulative grade point average of 3.0 in science and mathematics through the junior year are eligible for departmental honors in chemistry. An additional requirement for honors is the submission of a senior thesis based upon research performed during the senior year. The student will be given an oral examination in May by his or her research supervisor and the undergraduate research committee. The awarding of honors requires

the recommendation of this committee and is a recognition of superior performance in research and scholarly endeavors. The award is contingent upon maintenance of a 3.0 cumulative grade point average in all course work in science and mathematics.

Courses*

CHE 101, 102 General Chemistry

A broad introduction to the fundamental principles of chemistry, including substantial illustrative material drawn from the chemistry of inorganic, organic and biochemical systems. The principal topics covered are: stoichiometry, the states of matter, chemical equilibrium and introductory thermodynamics, electrochemistry, chemical kinetics, electronic structure and chemical bonding, chemical periodicity. The course emphasizes basic concepts, problem solving and factual material. This course provides the necessary foundation for students who wish to pursue further course work in chemistry. It is assumed that the student enrolled in CHE 101 has taken a chemistry course in high school. It is strongly recommended that CHE 105, 106 and MSM 121 and 122 or 123 be taken concurrently with CHE 101, 102. (Note that CHE 106 is prerequisite to CHE 201.) Three lecture hours and one discussion hour per week.

Prerequisite to CHE 102: CHE 101 or 124.
Fall (CHE 101); spring (and summer) (102), 4 credits each semester

Staff

CHE 103, 104 Honors Chemistry

Designed for students with strong interest in science who may major in chemistry or a related field. The topics covered in this course are similar to those covered in CHE 101, 102, but the course draws more upon background in mathematics and physics. It is assumed that

the student enrolled in CHE 103 has taken courses in chemistry and physics in high school, and it is strongly recommended that PHY 101, 102 be taken concurrently with CHE 103, 104. Three lecture hours and one discussion hour per week.

Corequisite to CHE 103: MSM 121.

Prerequisite to CHE 104: CHE 103.

Corequisite to CHE 104: MSM 122.

Fall (103) and spring (104), 4 credits each semester

J. Doll

CHE 105, 106 General Chemistry Laboratory

Designed to familiarize students with (1) some chemical and physical properties of substances, (2) techniques of quantitative chemistry and (3) scientific methodology. Four hours of laboratory and discussion per week.

Pre- or corequisite to CHE 105: CHE 101 or 124.

Prerequisite to CHE 106: CHE 105.

Pre- or corequisite to CHE 106: CHE 102.

Fall (105), spring (106), 1 credit each semester

CHE 109, 110 Honors Chemistry Laboratory

Laboratory program similar in content to CHE 105, 106 but conducted at a more intensive and demanding level. Four

*See p. 75, Information About Course Credit.

Students may request that prerequisites or corequisites be waived by petition to the Coordinator of Undergraduate Studies of the Department of Chemistry.

hours of laboratory and discussion per week.

Corequisite to CHE 109: CHE 103.

Prerequisite to CHE 110: CHE 109.

Corequisite to CHE 110: CHE 104.

Fall (109 and spring (110), 1 credit each semester

CHE 123, 124 Elementary Chemistry

An introduction to the concepts of chemical bonding and reactivity that underlie modern inorganic, organic and biochemistry. These concepts will be illustrated with examples from the life sciences. The full year sequence may serve as the equivalent of CHE 101, and may be applied as prerequisite to CHE 102. CHE 123 is suitable for liberal arts students, Elementary Education majors, and students preparing for nursing and some allied health professions. Previous background in chemistry is helpful, but not required. CHE 123 may not be taken for credit by students who have completed CHE 101 or its equivalent. Students planning to take CHE 102 following 124 are urged to take note of the CHE 101, 102 mathematics recommendation and prepare accordingly (i.e. take MSM 101 if necessary). Three hours per week.

Prerequisite to CHE 124: CHE 123.

Fall (123) and spring (124), 3 credits each semester

T. Goldfarb, R. Kerber

CHE 153 Physical Chemistry I

Introduction to rate laws, mechanisms and transition-state theory of chemical kinetics. Equations of state for ideal gases, real gases, liquids and solids. Basic concepts of thermodynamics: state variables, the laws of thermodynamics, energy, entropy, free-energy functions and conditions of equilibrium. Application to processes in gases, to chemical reactions, to phase equilibria, to ideal and real solutions and to electrochemical systems. Three lecture hours per week.

Prerequisite: CHE 102 or 104.

Corequisites: MSM 122 and PHY 101 or 131.

Fall and spring, 3 credits

S. I. Tu

CHE 154 Physical Chemistry II

Classical kinetic theory of gases; introduction to the quantum theory and statistical mechanics of internal molecular motion; spectroscopic determination of equilibrium constants; interaction of molecules with static electromagnetic fields; ionic bonding; introduction to transport phenomena; electrical conduction and electrochemistry; introduction to molecular theories of chemical kinetics. Three lecture hours per week.

Prerequisite: CHE 153 (or 158 with permission of instructor).

Corequisites: MSM 151 and PHY 102 or 132.

Spring, 3 credits

CHE 155 Solution Chemistry Laboratory

Chemical and instrumental analysis applied to solution equilibria and reaction kinetics. Six hours of laboratory and discussion per week.

Prerequisite: CHE 106 or 110.

Corequisite: CHE 153.

Fall, 2 credits

CHE 156 Transport Properties and Thermodynamics Laboratory

The measurement of reaction heats, EMF, transport coefficients and activity coefficients. Six hours of laboratory and discussion per week.

Prerequisite: CHE 155.

Corequisite: CHE 154.

Spring, 2 credits

CHE 158 Physical Chemistry (Short Course)

A one-semester treatment of fundamental concepts of physical chemistry, intended primarily for students of the biological sciences desiring an introduction to physical chemistry. Topics include equations of state; classical thermodynamics and its application to chemical equilibrium in reaction systems, multiphase systems, and electrochemical cells; kinetic theory of gases; transport properties, chemical kinetics. Three lecture hours per week. Cannot be taken

for credit by students who have completed CHE 153.

Prerequisite: CHE 102 or 104.

Co- or prerequisites: MSM 122, PHY 101 or 103.

Spring, 3 credits

F. T. Bonner

CHE 160 Chemistry—Structure

The concept of structure in chemistry from formula to geometric structure to electronic structure. The use of symmetry in structural specifications. Experimental methods of structural determination. The relations between geometric and electronic structures. The relations between structure, energetics and chemical reactivity. Intended for students with general, not necessarily professional, interests in chemistry.

Prerequisite: CHE 102 or 104.

Fall, 3 credits

CHE 161 Chemistry—Dynamics

The role of time-dependent phenomena in chemistry. Reaction kinetics and reaction mechanisms. Microscopic models for chemical reactions. The relationship between energetics and kinetics. Examples from organic and inorganic systems as well as those of biological significance. Experimental methods in chemical dynamics. Intended for students with general, not necessarily professional, interests in chemistry.

Prerequisite: CHE 102 or 104.

Spring, 3 credits

CHE 201, 202 Organic Chemistry A

A systematic discussion of the structure, physical properties and chemical reactions of carbon compounds, based on modern views of chemical bonding, thermodynamics, and kinetics. Mechanistic as well as synthetic aspects of organic reactions are emphasized. Selected topics in the organic chemistry of naturally occurring substances are considered. It is recommended that CHE 203, 204 or CHE 207 be taken concurrently with CHE 201, 202. Three lecture hours per week.

Prerequisites to CHE 201: CHE 102 or 104; 106 or 110.

Prerequisite to CHE 202: CHE 201.

Fall (201) and spring (202), 3 credits each semester

W. J. le Noble, D. M. McDaniel

CHE 203, 204 Organic Chemistry Laboratory B

Fundamental laboratory techniques of organic chemistry, including methods of isolation, purification and structure identification, with applications to synthetic, structural and mechanistic problems. For students who will require substantial laboratory skills, such as those planning careers in research.

Prerequisite: CHE 106 or 110.

Corequisites: CHE 201, 202 or 211, 212.

Prerequisite to CHE 204: CHE 203.

Fall (203) and spring (204), 2 credits each semester

A. Levy

CHE 207 Organic Chemistry Laboratory A

Techniques of isolating and handling organic substances, including biological materials. A one-semester course which provides a basic organic laboratory experience. It is recommended that students take 207 at the same time as or immediately following CHE 202 or 212. Four laboratory and one lecture hour per week.

Prerequisite: CHE 106 or 110. Co- or prerequisite: CHE 201 or 211.

Fall and spring, 2 credits

P. Helquist, L. Altman

CHE 211, 212 Organic Chemistry B

A systematic discussion of the structures, physical properties and chemical reactions of carbon compounds, aimed for students with a background of chemical kinetics and thermodynamics. It is recommended that CHE 203, 204 or CHE 207 be taken concurrently with CHE 211, 212. Three lecture hours per week.

Prerequisite to CHE 211: CHE 153.

Prerequisite to CHE 212: CHE 211.

Fall (211) and spring (212), 3 credits each semester

CHE 230 Chemistry in Technology and the Environment

Use of chemical principles in understanding processes that occur in the modern technological world and in the natural environment. Certain ecological problems of a chemical nature are analyzed. Methods of controlling these problems are discussed. Two lecture hours per week. Prerequisite: CHE 102 or 104.

Spring, 2 credits

T. D. Goldfarb

CHE 239 Materials and Methods in Teaching Chemistry

Designed for prospective secondary school teachers of chemistry, the course emphasizes the techniques appropriate to the teaching of chemistry at that level. Recent curricular developments are examined in detail. There lecture hours per week.

Prerequisites: CHE 153 and PHY 132 or equivalent.

3 credits

CHE 255 Introduction to Quantum Chemistry

Introductory quantum mechanics including applications to atomic and molecular systems. The Schrödinger differential equation will be solved for simple systems and the general theory applied in a discussion of chemical bonding, molecular structure, and rotational, vibrational and electronic spectra. Three lecture hours per week.

Prerequisites: CHE 153 or 158, MSM 151.

Corequisite: PHY 151 or 141.

Fall, 3 credits

CHE 256 Statistical Thermodynamics in Kinetics

Introductory statistical mechanics including energy levels of idealized models for complex systems; effects of particle indistinguishability; statistical thermodynamics of classical systems; the microscopic basis for chemical equilibrium; the Gibbs Ensemble method for systems of chemical interest; the experimental basis for the study of kinetic phenomena; and the models for the theoretical under-

standing of rate laws and mechanisms. Three lecture hours per week.

Prerequisites: CHE 154, 255, MSM 152.

Spring, 3 credits

CHE 257 Instrumental Methods of Physical Chemistry

Electronics, vacuum systems, optical instrumentation, properties of gases, electric and magnetic properties of matter. Six hours of laboratory and discussion per week.

Prerequisite: CHE 155.

Corequisites: CHE 201 or 211 and 255.

Fall, 2 credits

CHE 258 Molecular Structure and Spectroscopy Laboratory

Basic principles of optical, EPR and NMR spectra of molecules. Six hours of laboratory and discussion per week.

Prerequisites: CHE 155, 201 or 211 and 255.

Spring, 2 credits

CHE 262 The Logic of Thermodynamics

The empirical and logical basis of the laws of thermodynamics and their historical evolution are explored. The applicability of thermodynamic reasoning to problems in the "exact" and "inexact" sciences is considered. Some discussion of the connections between the macroscopic laws and the microscopic structure of matter is included.

Prerequisites: One year of college chemistry and permission of instructor.

Fall, 3 credits

CHE 305 Inorganic Chemistry I

A survey of inorganic chemistry covering various classes of inorganic compounds and reactions with emphasis on the structural aspects. Wherever possible, the subject is treated on the basis of modern concepts of chemical bonding. Thermodynamic and kinetic aspects of inorganic reactions are included. Three lecture hours per week.

Prerequisites: CHE 202 or 212 and 153.

Fall, 3 credits

A. Haim

CHE 306 Inorganic Chemistry II

A continuation of CHE 305. Three lecture hours per week.

Prerequisite: CHE 305.

Spring, 3 credits

A. Haim

CHE 315 Intermediate Organic Chemistry

An extension of the material introduced in CHE 201, 202 or 211, 212. Electronic and stereochemical theory are utilized to discuss selected organic reactions, syntheses and natural products. Three lecture hours per week.

Prerequisite: CHE 202 or 212.

Spring or fall, 3 credits

P. Helquist

CHE 325 Quantum Mechanics and Spectroscopy

An introduction to the quantum theory used in the spectroscopic investigation of atomic and molecular structure. Topics to be covered include elementary matrix techniques, time dependent perturbation theory, elementary group theory and applications to optical and magnetic resonance spectroscopy. Three lecture hours per week.

Prerequisites: CHE 256 and 258.

Fall, 3 credits

CHE 391-392 Senior Research

A two-semester research program to be carried out under the supervision of a staff member. The results of this work are to be submitted to the department in the form of a senior research report. The student will be given an oral examination in May by a faculty committee consisting of the student's supervisor and three other faculty members. A composite grade for the two semesters will be assigned. Students who are interested in

registering for this course should apply to the office of the chairman prior to registration.

Prerequisites: CHE 156, 204, 258, senior standing, acceptance as a research student by a member of the departmental staff and permission of department.

Corequisite: CHE 305.

Fall and spring, 3 credits each semester
Staff

CHE 393, 394 Tutorial in Special Topics in Chemistry

Supervised readings, laboratory work or both on specialized topics in chemistry. For students who wish to gain familiarity with a subject or area not included in sufficient depth in other undergraduate courses. Departmental permission to register will be based on a brief outline jointly submitted by the student and faculty supervisor. A final report will be submitted by the student. May be repeated for credit.

Prerequisites: Consent of an instructor and permission of department.

Fall and spring, 1 to 3 credits each semester

Staff

CHE 395 Undergraduate Teaching Practicum

An opportunity for selected upper division students to collaborate with the faculty in teaching. In addition to working as tutors or laboratory assistants, students will meet at least weekly with their faculty supervisors to discuss teaching strategies and problems encountered. Students may participate only in completed courses in which they have excelled. Students may offer only one Teaching Practicum for credit.

Prerequisite: Upper division standing and permission of department.

Fall and spring, 3 credits

Staff

Graduate Courses

Advanced chemistry students may elect 500-600 level graduate courses in aspects of chemistry of particular interest to them. The requirement for registration is a 3.0 average in CHE courses or permission of the instructor. See the *Graduate Bulletin* for course descriptions.

CHE 501 *Structural Organic Chemistry*

CHE 502 *Mechanistic Organic Chemistry*

CHE 503 *Synthetic Organic Chemistry*

CHE 511 *Structural Inorganic Chemistry*

CHE 512 *Physical Methods in Inorganic Chemistry*

CHE 513 *Reaction Mechanisms in Inorganic Chemistry*

CHE 521 *Quantum Chemistry I*

CHE 522 *Quantum Chemistry II*

CHE 523 *Chemical Thermodynamics*

CHE 526 *Chemical Kinetics*

CHE 528 *Statistical Mechanics*

CHE 529 *Nuclear Chemistry*

CHE 530 *Physical Chemistry of Macromolecules*

CHE 604 *Molecular Biochemistry*

CHE 623 *Molecular Spectroscopy*

CHE 624 *Magnetic Resonance*

CHE 625 *Molecular Structure and Crystallography*

CHE 626 *Computer—Controlled Experimentation in Chemistry*

Chinese

Assistant Professor: Shi Ming Hu

Courses*

CHI 111, 112 Elementary Chinese

An introduction to spoken and written Chinese Mandarin, with equal attention to speaking, reading and writing. Laboratory practice supplements class work.

Fall and spring, 3 credits each semester

CHI 151, 152 Intermediate Chinese

An intermediate course in Chinese Mandarin to develop audiolingual skills and reading and writing ability. Selected texts will serve as the basis for practice in reading comprehension and composition. Intensive exercises in "character writing"

will be required to develop writing technique.

Prerequisites: CHI 111, 112.

Fall and spring, 3 credits each semester

CHI 221, 222 Advanced Chinese

An advanced course in Chinese Mandarin to increase comprehension and writing ability. Selected reading materials include newspapers, contemporary Chinese literature and other samples of different writing styles.

Prerequisites: CHI 151, 152.

Fall and spring, 3 credits each semester

*See p. 75, Information About Course Credit.

Classics and Classical Languages

Professor: Richmond Y. Hathorn

Lecturer: Aaron Godfrey

Courses*

Classics

CLS 111 The Classical Tradition

A study, through analysis of Greek and Roman literature, of the basic ideas that distinguish the classical world-view from the romantic-modern world-view: reverence for tradition; the idea of high-style; the tragic vision; the ethical approach to history and to the arts and sciences.

Fall, 3 credits

R. Hathorn

CLS 113 Survey of Greek Literature in Translation

A study of the development of classical Greek literature from the beginnings to the decline of the Roman Empire; extensive reading of the Greek classics in English translation.

Fall, 3 credits

CLS 114 Survey of Latin Literature in Translation

A study of the development of classical Latin literature from the beginnings to the decline of the Roman Empire; extensive reading of the Latin classics in English translation.

Spring, 3 credit

CLS 115 Classical Mythology

A study of the Greek myths, classified according to the basic mythic patterns of Death and Rebirth and the Sacred Marriage; the influence of these myths on literature, art, and the history of ideas.

Fall and spring, 3 credits

R. Hathorn

CLS 211 Classical Drama and Its Influences

A study of the Greco-Roman theatre, dramatic festivals and play production. Readings in English translation of most of the extant tragedies, comedies and satyr-plays, with consideration of their meaning and influence in European culture.

Fall, 3 credits

R. Hathorn

CLS 214 Classical Rhetoric and Literary Criticism

A study of the works of Aristotle, Horace, Longinus and the minor rhetoricians in rhetoric and literary criticism; and of their influence in the rhetorical and literary theory and practice of the Middle Ages, Renaissance and Neo-Classical Period.

Spring, 3 credits

CLS 299 Directed Readings in Classics

Intensive study of a particular author, period, or genre of Greek and Latin literature in translation under close faculty supervision.

Prerequisite: Permission of chairman.

Fall and spring, 1 to 4 credits

Staff

CLS 350 Greek Life and Thought

An inquiry into the social, political and psychodynamic relations of Greek thought in its development from Homer to Aristotle. While the historical conditions of this development and the social correlates of ancient Greek creativity are care-

*See p. 75, Information About Course Credit.

fully explored, the selected texts are studied in their conceptual relations to each other and as intellectual and expressive human constructions. This course is identical with PHI 202.

Spring, 3 credits

V. Tejera

Greek*

GRK 111, 112 Elementary Greek

An introduction to the Greek language, including the study of grammar, with reading and writing.

Fall and spring, 3 credits each semester

R. Hathorn

GRK 151, 152 Intermediate Greek

The reading and interpretation of works such as the *Apology* of Plato, the *Prometheus Bound* of Aeschylus or selections from the New Testament.

Prerequisite: GRK 112 or permission of instructor.

Fall and spring, 3 credits each semester

R. Hathorn

GRK 299 Directed Readings in Greek

Intensive study of a particular author, period, or genre of Greek literature in the original under close faculty supervision. May be repeated.

Prerequisite: Permission of chairman.

Fall and spring, 1 to 4 credits

Staff

Latin*

LAT 111, 112 Elementary Latin

This intensive course is designed to prepare the beginning student to translate Latin that he may need to use in his undergraduate or graduate study. Focus of the course is on the fundamentals of grammar and techniques of translation.

Fall and spring, 3 credits each semester

A. Godfrey

LAT 113 Intermediate Latin

This course is intended to serve as a transition between LAT 111, 112 and LAT 151. The course also outlines the fundamental distinction between classical and medieval Latin.

Spring, 3 credits

A. Godfrey

LAT 151, 152 Readings in Latin Literature

Readings in classical Latin literature of the Republic. The course will include a brief intensive review of grammar and the sampling of a number of authors, including Catullus, Cicero, Virgil and Livy.

Prerequisite: Three years of high school Latin or the equivalent.

Fall and spring, 3 credits each semester

LAT 153 Literature of the Roman Republic

Selected works of Plautus, Terence, Cicero, Lucretius and Catullus will be translated and examined in their social and historical context. The reading of

*See p. 75, Information About Course Credit.

critical works in English will also be required.

Prerequisite: Three years of high school Latin or the equivalent.

Fall, 3 credits

LAT 154 Literature of the Roman Empire

Selected works of Virgil, Horace, Livy, Petronius, Martial, Tacitus and Juvenal will be translated and examined in their social and historical context. The reading of critical works in English will also be required.

Prerequisite: Three years of high school Latin or the equivalent.

Spring, 3 credits

LAT 155 Medieval Latin

Readings in Christian Latin literature, medieval Latin literature and Neo-Latin literature of the Renaissance.

Prerequisite: Three years of high school Latin or the equivalent.

Fall, 3 credits

A. Godfrey

LAT 156 Renaissance Latin

Translation and discussion of selected Latin works from the Age of Dante to the present, with a survey of Renaissance and Neo-Latin writings.

Prerequisite: Three years of high school Latin or the equivalent.

Spring, 3 credits

A. Godfrey

LAT 299 Directed Readings in Latin

Intensive study of a particular author, period, or genre of Latin literature in the original under close faculty supervision.

Prerequisite: Permission of chairman.

Fall and spring, 1 to 4 credits

A. Godfrey

Program on Communications in Society

Chairperson: Gladys Engel Lang

Faculty Advisory Committee: Social Work—Stephen Antler; Theatre Arts—Leonard Auerbach, Richard Hartzell; English—Martin Buskin; Education—Aaron S. Carton; Sociology—Norman Goodman; Psychiatry—Eli A. Rubinstein; Philosophy—Walter Watson

Individuals in modern technological society have become increasingly dependent upon the media of mass communication in seeking and disseminating information; they are subject to media influence in the process of cultivating tastes, formulating opinions and judging standards of behavior. The Program on Communications in Society offers a flexible and innovative curriculum which is designed to help students acquire the critical outlook and technical experience to enable them to participate in the communication process as responsible media consumers, practitioners and/or professionals. Additional courses are under consideration and will be announced as they become available. Since no academic major is offered at present, students should view these courses as complementary to their degree major and career orientations.

Courses*

EGL 107 The Exposition of Ideas: Journalism I

(For course description, see alphabetical listing: English, Courses in Writing.)

EGL 108 The Exposition of Ideas: Journalism II

(For course description, see alphabetical listing: English, Courses in Writing.)

INT 201 Seminar: Basic Issues in Public Communication

The communications seminar has two alternating fortnightly components: (1) an open forum which consists of lectures built around basic issues concerning public communication, with feedback and audience participation encouraged; and (2) a working seminar that emphasizes critical, but constructive, analysis of Open Forum lectures, as well as provisions for a continuing dialogue on related topics.

Prerequisite: Upper division standing.

Recommended: PSY 208 or SOC 241 or SOC 262.

Fall and spring, 3 credits

INT 291, 292 Workshops in Media Consumership

A course that involves the student in

cooperative research and evaluation projects designed to explore and elucidate the communication process and its impact on society. Investigations into the various types of media and their use for mass communication will involve examination of communication phenomena over time and under varied conditions—e.g., comparative, cross-national, cross-strata, historical. Case history examination will be encouraged. May be repeated for different workshops, but total credit may not exceed nine credits.

Prerequisite: Permission of instructor.

Recommended: PSY 209 or SOC 241 or SOC 262.

Fall and spring, 3 credits each semester

INT 298, 299 Practicum in Newspaper Journalism

In a series of twice-monthly seminars, the course will examine basic journalistic skills and their practical applications in the publishing of a newspaper. The impact a newspaper has on the community for which it publishes will also be discussed. May be repeated, but total credit may not exceed six credits.

Fall and spring, 1 to 3 credits each semester. For elective credit only.

M. Buskin

Interdisciplinary Program in Comparative Literature

Professors: French—Konrad Bieber; English—Donald Fry; Comparative Literature—Harvey Gross; Classics—Richmond Hathorn; German—Roman Karst; Comparative Literature—Jan Kott; English—Ruth Miller; German—Klaus Schröter; English—Louis Simpson; Scandinavian—Leif Sjöberg; Library—Gerhard Vasco (*Adjunct*); English—Herbert Weisinger; French—Eléonore Zimmermann

Associate Professors: English—Kofi Awoonor, Betty Bennett (*Adjunct*); Philosophy—Antonio de Nicholas, Dick Howard; French—Sandy Petrey

*See p. 75, Information About Course Credit.

Assistant Professor: Philosophy—Hugh Silverman

Lecturer: Joan Fry

The major in comparative literature stresses extensive reading in world literature with a concentration in two national literatures, one of which may be English. The student investigates a variety of literary and cultural traditions within the larger context of the relationship between literature and society. Literature is studied from various points of view (Analytic Modes) and in the context of other disciplines (Interdisciplinary Modes). Courses emphasize the crossing of national boundaries, interdisciplinary studies, and non-conventional explorations. The program encourages students to pursue their own tastes and interests within a structure of practical criticism.

The student must attain competence in two languages, one of which may be English. Courses in other supporting languages may be taken in translation. Those planning to pursue graduate study will find knowledge of two languages other than English to be most helpful. Proficiency in the reading of one language other than English must be demonstrated by the end of the sophomore year.

The study of comparative literature is useful preparation for careers in some aspects of the creative arts and government service, as well as for graduate study in foreign languages and comparative literature.

Requirements for the Major in Comparative Literature

In addition to the general university requirements for the Bachelor of Arts degree, the following courses are required for the interdisciplinary major in comparative literature:

	<i>Credits</i>
A. CLT 110, 111 Survey of Major Authors and Writings	6
B. CLT 200 Techniques of Comparative Literature	3
C. EGL 237 Literary Analysis and Argumentation	3
D. Literature in the original language	
Two semester courses in the literature of a language other than English	6
Note: Languages other than English which are acceptable are: French, German, Greek, Hebrew, Italian, Latin, Polish, Portuguese, Russian, Spanish, Swedish and Yiddish.	
Two semester courses (on the 200-level) in the literature of England or America	6
E. Analytic Modes	9
The study of individual works of literature in terms of various	

critical approaches and concepts. Three courses from the following sequence are required:

- CLT 210, 211, 212 Topics in Literary Periods
- CLT 220, 221, 222 Topics in Themes of Literature
- CLT 240, 241, 242 Topics in Literary Traditions
- CLT 250, 251, 252 Topics in Literary Genres
- CLT 261, 262 Topics in Aesthetic Theory

F. Interdisciplinary Modes 6

The study of literature in its relationship to other disciplines.

Two courses from the following sequence are required:

- CLT 351, 352 Political and Social Contexts
- CLT 361, 362 Intellectual Contexts
- CLT 371, 372 Cultural Contexts

G. Practica in Comparative Literature

- CLT 375 Major Authors 3
- CLT 290 Senior Seminar 3
- CLT 399 Readings in Comparative Literature 3

Total 48

Additional Matters Pertaining to the Major

A. Each semester the program chairman will announce before Advance Registration those courses from other departments which may be used to fulfill the requirements in Analytic and Interdisciplinary Modes.

B. The student is advised to take the courses in Analytic Modes and Interdisciplinary Modes in those languages which he or she has mastered.

C. Courses used to satisfy the requirement for six credits of literature in a language other than English may not be used also to satisfy the requirement of six credits in Analytic Modes.

D. The student is urged to take courses in the history and development of his or her languages, such as EGL 281, History of the English Language, etc.

E. Although the student will frequently offer English and one other language, he or she also has the option to offer two languages, neither of which is English.

F. The student is urged to take CLT 115 and 120 and additional courses in the history and arts of the period or languages of their major interests.

G. Students may earn credit toward their major through SUNY sponsored foreign study programs at universities in France, Germany, Italy, Spain, Israel, Mexico and Puerto Rico.

Courses*

CLT 110, 111 Surveys of Major Authors and Writings

A survey in translation of the major authors and works of western culture, focused around such problems as the self, good and evil, the idea of tradition, or freedom. The two-semester sequence is advised, but the student may take a single semester.

Fall and spring, 3 credits each semester

CLT 115 Masterpieces of Modern European Literature

A survey in translation of the major authors of modern European literature, not including English, from 1918 to the present.

Spring, 3 credits

CLT 120 Masterpieces of Non-Western Literature

A survey of the major themes and forms of non-Western literature, such as Oriental or Indian or African. Topics will vary. May be repeated.

Fall, 3 credits

CLT 200 Techniques of Comparative Literature

An introduction to the different modes of analyzing literature by periods, ideas, traditions, genres and aesthetic theories. Teaching will be done by instructors from various departments. Open to all students.

3 credits

CLT 210, 211, 212 Topics in Literary Periods

A study of the major literature of an historical period: classical, medieval, Renaissance, neo-classical, romantic, Victorian and modern. Topics will vary.

Fall and spring, 3 credits

CLT 220, 221, 222 Topics in the Themes of Literature

The history of ideas and their recurrence across national boundaries or literary genres, as for example the Don Juan theme or the Faust theme, or the idea of decorum, or the idea of the covenant. Topics will vary.

Fall and spring, 3 credits

CLT 240,241, 242 Topics in Literary Traditions

The analysis of literature from the point of view of traditions and movements such as classicism, romanticism, realism, naturalism, surrealism, the Hebraic and Christian tradition. Topics will vary.

Fall and spring, 3 credits

CLT 250, 251, 252 Topics in Literary Genres

The analysis of form in the epic, drama, lyric or novel. The course will focus on the major works of literature of a single genre, cutting across national boundaries. Topics will vary.

Fall and spring, 3 credits

CLT 261, 262 Topics in Aesthetic Theory

A study of the meaning of critical terms such as symbolism, allegory, and myth; and of diverse theories of literature with focus on ways of analyzing form and structure. Topics will vary.

Fall and spring, 3 credits

CLT 290 Senior Seminar

Preparation of a paper resulting from the student's independent reading on a topic of his choice.

Prerequisite: Permission of instructor and program chairman.

3 credits

*See p. 75, Information About Course Credit.

CLT 351, 352 Political and Social Contexts

An inquiry into the relationship between the events and materials of political and social history and their effect on the form and content of the literature of a period. Topics will vary.

Fall and spring, 3 credits

CLT 361, 362 Intellectual Contexts

An inquiry into the primary writings and significant documents in the history of ideas and their effect on the form and content of a period. Topics and periods will vary.

Fall and spring, 3 credits

CLT 371, 372 Cultural Contexts

A broad study of the aesthetic milieu and its relationship to the form and content of the literature of an era. This will include not only the literature but the arts, theatre, music, architecture of a period, cutting across national boundaries. Topics, periods and countries will vary.

Fall and spring, 3 credits

CLT 375 Major Authors Tutorial

Students will engage in an intensive study of the works of any two authors from two different countries together with the major critical materials about them. Only one writer may be read in English or in translation. Students will choose authors in consultation with a tutor.

Prerequisite: Completion of the required courses in the Analytic Modes and Interdisciplinary Modes sequences.

Fall and spring, 3 credits

CLT 399 Readings in Comparative Literature

Study of a specific topic undertaken with close faculty supervision. A substantial portion of the reading must be in the student's foreign-language offering. May be repeated once.

Prerequisite: Permission of program chairman.

Fall and spring, 3 credits

Department of Earth and Space Sciences

Professors: A. Edward Bence, Neville L. Carter, Robert T. Dodd, Jr., Donald H. Lindsley, Gilbert N. Hanson, Tobias C. Owen, Allison R. Palmer (*Chairman*), James J. Papike, Charles T. Prewitt, Oliver A. Schaeffer, Michal Simon, Philip M. Solomon

Associate Professors: Peter W. Bretsky, Johannes Hardorp, J. Hogan, Roger F. Knacke, Jeffrey S. Levinton, Barry W. Lutz (*Adjunct*), Deane M. Peterson

Assistant Professors: Karl W. Flessa, John Kwan, William J. Meyers, Otto H. Muller, John C. Theys, Donald J. Weidner

Curator and Adjunct Lecturer: Steven C. Englebright

The earth and space sciences undergraduate program is designed to offer a wide range of choice to the student interested in astronomy, the physical, geochemical and environmental history of the earth, and the physical aspects of the environment. In addition to acquiring a

strong background in the basic physical sciences, mathematics, and in some cases, biology, ESS undergraduate majors will be introduced to the problems of the complex physical world with its large time-space scale. Interdisciplinary programs can be tailored to the special interests of the student through consultation with an advisor assigned by the department.

Students are prepared primarily for graduate studies in astronomy, astrophysics, geophysics, petrology, paleoecology or geological oceanography. Other course sequences can be designed to obtain training relevant to careers as earth science teachers in elementary or secondary schools or for work in a number of academic or governmental agencies concerned with the physical aspects of the environment.

Requirements for the B.S. Degree

The B.S. program in Earth and Space Sciences is a pre-professional course of study. The B.S. program prepares students for graduate work in the fields of astronomy/astrophysics, the earth sciences or geological oceanography, or for careers in industry, government, teaching or research.

1. Geology concentration

A. The following departmental courses are required for the B.S.

- ESS 102 The Earth in the Solar System
- ESS 112 Physical Geology Laboratory
- ESS 106 The Ages Before Man
- ESS 116 Historical Geology Laboratory
- ESS 201 Mineralogy
- ESS 211 Paleontology
- ESS 306 Petrology
- ESS 309 Structural Geology
- ESS 363 Sedimentation and Stratigraphy
- ESS 304 Field Methods in Geology or
- ESS 305 Field Geology or equivalent

B. In addition to the courses listed above, at least six credits are required from the following:

- ESS 203 Astronomy
- ESS 301 Optical and X-ray Mineralogy
- ESS 307 Petrology Laboratory
- ESS 317 Marine Ecology
- ESS 325 Marine Geochemistry
- ESS 352 Geophysics
- ESS 364 Marine Geology
- Any 500 level ESS course

or: from any 200 level or higher BIO, CHE, MSM or PHY course from a current list of approved related sciences courses available in

the departmental office. These must be in addition to the related sciences courses required under C.

C. In the related sciences, the following courses are required for the B.S.:

MSM 121 Calculus I

MSM 122 Calculus II or 123 Calculus II and Probability

CHE 101 or 103 or 123, 124 General Chemistry or Honors Chemistry or Elementary Chemistry

CHE 102 or 104 General Chemistry or Honors Chemistry

PHY 101, 102 or 103, 104 or 131, 132 General Physics or Physics for the Life Sciences or Introductory Physics

plus: enough courses from a current list of approved related science courses so that at least four lecture courses of 3 or more credits are concentrated in one of the following fields: mathematics, chemistry, physics, biology, or engineering. The specific required related science courses listed above may be part of the required minimum of four courses.

D. All courses taken to meet the departmental requirements must be taken for a letter grade.

2. Astronomy/Planetary Sciences Concentration

A. The following departmental courses are required for the B.S.:

ESS 102 The Earth in the Solar System

ESS 203 Astronomy

ESS 341, 342 Astrophysics I, II

The student must take at least one additional course from among 200 level or higher ESS courses.

B. Required physics courses:

PHY 101, 102 General Physics I, II

PHY 151 General Physics III

PHY 154 Optics and Waves

plus: at least 12 credits from PHY courses number 200 or higher.

C. Required MSM courses:

MSM 121 or 191 Calculus I or Honors Calculus I

MSM 122 or 192 Calculus II or Honors Calculus II

MSM 151 or 193 Calculus III: Linear Algebra or Honors Calculus III

MSM 152 or 194 Calculus IV: Multivariate Calculus or Honors Calculus IV

Requirements for the B.A. Degree

The B.A. program in Earth and Space Sciences is designed to meet the needs of students who desire a broad and diverse liberal arts science background. It is not intended to be a pre-professional pro-

gram, but may be useful for careers in teaching, journalism, management or the law. Departmental requirements for the B.A. degree in Earth and Space Sciences:

1. At least 28 credits from departmental courses, including a minimum of one course from each area below and no more than a total of four 100-level courses.

Astronomy area:

ESS 203 Astronomy

ESS 248 Intelligent Life in the Universe

Earth Sciences area:

ESS 102/112 The Earth in the Solar System and Physical Geology
Laboratory

ESS 103 Atmospheres

ESS 105 Weather and Climate

ESS 106/116 The Ages Before Man and Historical Geology
Laboratory

ESS 201 Mineralogy

ESS 202 Environmental Geology

ESS 211 Paleontology

ESS 104 Oceanography

ESS 325 Marine Geochemistry

ESS 364 Marine Geology

2. One year of study in three of the following outside science areas: Mathematics, Chemistry, Physics, Biology.

3. All courses to meet these requirements must be taken for a letter grade. The B.A. program is flexible, and many different programs of the student's design can be followed toward the B.A. if the three requirements above are met. Students should consult with their advisors regarding appropriate ESS and other science courses.

Earth Science Teacher Preparation

This department offers a program leading to provisional certification in earth science teaching, grades 7-12. Only students who complete the required pre-professional courses in education and the following courses: ESS 102/112, 104, 106/116, 201, 203, 211, 239, 240 and 306, and who have at least a 2.5 grade point average at the end of their junior year can be admitted to student teaching. Provisional certification may be acquired in either the B.A. or the B.S. program.

Marine Sciences

Students interested in the marine sciences should follow the recommended course sequence in earth sciences, choosing their ESS electives and science electives from among appropriate marine science courses offered by the ESS, Biology and Engineering Departments.

Honors Program in Earth and Space Sciences

Students who have maintained a cumulative grade point average of 3.5 in natural sciences and mathematics through the junior year may become candidates for departmental honors in earth sciences or astronomy upon application to the department. Candidates for honors in *geology* must include in their programs the following academic courses: ESS 102/112, 106/116, 201, 211, 301, 306, 307, 309, 363. Candidates for honors in *astronomy* must include a sequence of mathematics, physics and earth and space sciences courses approved by the student's advisor following petition by the student.

In addition to the academic program, the student must complete an honors thesis, which will be evaluated by a committee including the student's advisor and at least one other science faculty member, and must maintain a minimum 3.5 grade point average in all course work in natural sciences and mathematics.

Courses*

Introductory Courses

The following courses while of interest and value to science majors are primarily designed for the general University student who is not majoring in a physical science, but who elects the course either because of personal interest or to fulfill the general University requirement in the natural sciences.

ESS 101 Introduction to Astronomy: Physics of the Universe

Description of planets, stars, galaxies, black holes, pulsars, quasars, supernovae, white dwarfs. Man's place in the cosmos. Cosmological and cosmogonical theories. Three one-hour lectures and one one-hour recitation per week. Intended for students with little or no science background. ESS 101 and ESS 203 may not both be taken for credit.

Fall, 4 credits

J. Hardorp

ESS 102 The Earth in the Solar System

A study of the processes that have led to the constantly changing face of the earth and the unchanging face of its moon. Topics to be discussed include: (1) composition of the earth-moon system and the terrestrial planets; (2) study of ter-

restrial and lunar materials and the origin of the principal rock types; (3) interior of the earth and the moon including their thermal, chemical and mineralogical constitution; (4) extensive consideration of global tectonics. Two one-hour lectures and a one-hour recitation each week.

Fall, 3 credits

J. Papike

ESS 103 Atmospheres

An introduction into the chemical properties, temperature, motions, and cloud formation within planetary atmospheres. Emphasis is placed upon the earth's atmosphere, but in order to provide insights into general atmospheric phenomena, discussion and specific examples will be drawn from our rapidly expanding knowledge of the atmospheres

*See p. 75, Information About Course Credit.

of other planets. The approach to the subject will be deductive, showing how the properties of atmospheres may be deduced by means of general arguments based on the laws of physics and chemistry. Contemporary topics, such as possible man-made influences upon the earth's global climate, will also be included. Three one-hour lectures per week.

Spring, 3 credits

J. Hogan

ESS 104 Oceanography

This course examines the role the oceans play in making the surface of the earth suitable for the evolution and preservation of life. The evolution of the ocean basins and sea water are discussed. Topics cut across the usual fields of specialization because the economy of nature involves such diverse matters as the bio-chemistry of microscopic marine plants, inorganic weathering of rocks, and physical processes in the oceans and the atmosphere. The complex life support system that has made the earth a manned satellite of the sun is studied. Three one-hour lectures per week.

Fall, 3 credits

ESS 105 Weather and Climate

An introduction to the nature and causes of common meteorological phenomena, severe weather occurrences and climatic patterns. A description of the general features of our atmosphere will be followed by specific treatment of such topics as formation and movement of air masses and large-scale storms, techniques for weather prediction, weather satellites, hurricanes, tornadoes and thunderstorms, cloud and precipitation types, and optical and acoustical phenomena. The climatic history of the earth will be discussed as well as actual and potential effects of air pollution on weather and climate. This course is identical with ESC 102.

Fall, 3 credits

J. Hogan

ESS 106 The Ages Before Man

The earth is viewed as a dynamic system undergoing constant but subtle change. The history of the earth from its formation to the present is explored through study of techniques for determining geologic age and for extracting historical information from rocks; the origin of life; evolution of major animal and plant groups; the changing relationships between land and seas through time; and past changes in distribution of the continents. The impact of man on this dynamic system and speculations about the future are included. Three one-hour lectures per week.

Spring, 3 credits

A. Palmer

ESS 112 Physical Geology Laboratory

Three-hour laboratory to include rock and mineral identification, introduction to topographic and geologic maps, and field trips in the vicinity.

Corequisite: ESS 102.

Fall, 1 credit

ESS 114 Oceanography Seminar

Discussion and evaluation of assigned readings from the field of oceanography. For the student considering a career in oceanography to obtain penetrating insights into the diversity of professional preparation and areas of scientific inquiry encompassed within oceanography.

Corequisite: ESS 104.

Fall, 1 credit

ESS 116 Historical Geology Laboratory

An introduction to fossils and to the interpretation of geological history through use of geological maps and cross-sections. One three-hour laboratory per week.

Corequisite: ESS 106.

Spring, 1 credit

Intermediate Courses

The following courses are designed for majors in earth and space sciences or for other majors who choose to elect a course in this area. In general the courses require preparation in biology, chemistry, physics and/or mathematics at the university level.

ESS 201 Mineralogy

An introduction to the structure, chemistry and physical properties of minerals, with particular emphasis on rock-forming minerals. Laboratories are devoted to elementary crystallography and the use of physical properties for mineral identification. Two lectures and one three-hour laboratory session per week.

Prerequisites: ESS 112, CHE 102 or 104.

Fall, 4 credits

R. Dodd

ESS 202 Environmental Geology

How geologic processes, past and present, influence man and his environment as shown through: studies of the abundance of natural resources, of their development and rate of depletion, and of the environmental and political impact of the mineral and petroleum industry; applications of engineering geology and land-use planning, earthquake prediction and control, and consideration of the geologic influence on the design of buildings, dams and highways; the consideration of waste disposal as a geologic process; the health hazards of natural radioactivity and trace elements. Two one-and-a-half-hour lectures per week.

Prerequisite: ESS 102.

Fall, 3 credits

A. Bence

ESS 203 Astronomy

A survey of the physical nature of the universe for the student with some background in physics and mathematics. May be taken instead of ESS 101 by students with better science preparation, but ESS 101 and ESS 203 may not both be taken for credit. Three one-hour lectures and one one-hour recitation per week. An optional observing session will be held

one evening per week.

Prerequisite: PHY 101 or PHY 103 or PHY 131.

Fall, 4 credits

R. Knacke

ESS 210 A History of Geology

In the 18th and 19th centuries, geologists generated concepts that commanded universal attention. A belief in the earth no older than a few thousand years was prelude to a history of geology that has often been expounded in the fashion of a fairy tale, as a battle between good and evil. Theoretical systems and methodological foundations for beliefs that catastrophism is evil and uniformitarianism is good will be examined.

Prerequisite: Completion of the general University requirement in natural sciences.

Fall, 3 credits

P. Bretsky

ESS 211 Paleontology

Principles and methods in the study of the history of life. The origin of life, pre-metazoan evolution, principles of evolution illustrated by extinct biotas, analysis of diversity and community structure, morphology and autecology of extinct species, paleobiogeography and dating are considered. Two lectures and one three-hour laboratory session per week.

Prerequisite: ESS 106.

Fall, 4 credits

K. Flessa

ESS 239 Materials and Methods in the Teaching of Earth Sciences

The course emphasizes techniques for the preparation of rocks, fossils and minerals, especially those from field trips made in the New York, Connecticut and

New Jersey area. Field collection, identification, laboratory preparation and classroom display and usage are emphasized. Instruction in the use of classroom equipment and general laboratory equipment is also covered. One three-hour laboratory-lecture per week and four field trips per semester.

Prerequisites: ESS 102, upper division standing and permission of instructor.

Corequisite: ESS 240.

Spring, 3 credits

S. Englebright

ESS 240 Observational Methods and Curriculum Developments in Earth Science Education

Emphasis placed on recent secondary school curricula and development of technical aids (i.e., displays, audiovisual materials for the classroom) as they relate to instruction in earth sciences. Two one-hour seminars a week and three to six all-day observation ses-

sions in elementary, junior and senior high school classrooms.

Prerequisites: ESS 102, upper division standing and permission of instructor.

Corequisite: ESS 239.

Spring, 3 credits

S. Englebright

ESS 248 Intelligent Life in the Universe

A survey of the observable universe; cosmological system; the evolution of the elements. Observation of simple and complex molecules in astronomical sources; the evolution of life on earth; the observable consequences of advanced technology; can life be detected elsewhere; three one-hour lectures per week.

Prerequisite: Completion of the general University requirements in natural sciences.

Spring, 3 credits

T. Owen

Advanced Courses

The following courses are designed primarily for science majors in their junior and senior years.

ESS 301 Optical and X-Ray Mineralogy

Development of methods for the identification of rock-forming minerals using the petrographic microscope and X-ray techniques. Two one-hour lectures and two three-hour laboratory sessions per week.

Prerequisite: ESS 201.

Spring, 4 credits

G. Hanson

proficiency of the student will be demonstrated by an individual mapping project and report, usually on a single outcrop scale.

Prerequisite: ESS 309.

Spring, 3 credits

O. Muller

ESS 304 Field Methods in Geology

Elementary mapping techniques, including pace-and-compass, alidade-and-plane table and aerial photo methods. In addition, theoretical aspects of sampling and surveying will be discussed. During the second half of the semester, week-end field trips will develop observational skills and specialized techniques in areas of primarily sedimentary, igneous and metamorphic terranes. The

ESS 305 Field Geology

A field course which may be taken at any one of several approved University field stations.

1 to 6 credits

ESS 306 Petrology

Principles of the description, classification and interpretation of igneous, metamorphic and sedimentary rocks. The student will be introduced to the use of field and laboratory data for interpreting the origin and evolution of various rock

types. Two one-hour lectures and one three-hour petrography laboratory session per week.

Prerequisite: ESS 201.

Spring, 3 credits

A. Bence

ESS 307 Petrology Laboratory

Study of igneous and metamorphic rocks in thin-section, with emphasis on the application of mineral and textural relations to their genesis. One three-hour laboratory per week.

Corequisites: ESS 301, 306.

Spring, 1 credit

A. Bence

ESS 309 Structural Geology

Principles of structural geology including classification, criteria for recognition and mechanics of formation of crustal structural features. Elementary concepts of rock mechanics. Discussion of important tectonic features of the continents and oceans. Accompanying laboratory to cover map interpretation and algebraic and graphical solutions of structural problems. Three one-hour lectures and one three-hour laboratory per week. Several two-day weekend field trips will be made to visit classical structural localities in the east.

Prerequisite: ESS 201.

Fall, 4 credits

O. Muller

ESS 317 Marine Ecology

A survey of biotic responses to ecological challenges in different marine realms. Controls of diversity and trophic structure in the marine ecosystem, historical aspects of marine realms, productivity in the oceans, plankton, soft-bottom communities, inter-tidal habitats, coral reefs, deep sea environments and effects of pollution in the ocean will be discussed. Three one-hour lectures per week. This course is identical with BIO 317.

Prerequisite: BIO 237.

Spring, 3 credits

J. Levinton

ESS 325 Marine Geochemistry

The chemistry of the oceans will be considered. The various mechanisms for regular ocean chemistry and the influence of ocean circulation on ocean chemistry will be discussed. The chemistry of the sea floor, including the ocean sediments, will be considered.

Prerequisite: CHE 102 or 104.

Fall, 3 credits

O. Schaeffer

ESS 341, 342 Astrophysics I, II

An introduction to, and development of, a firm physical understanding of the observed properties of the stars, Galaxy and galaxies. Topics will include the structure of the interior and atmosphere of stars, evolution of stars, dynamics of multiple star systems, physics of the interstellar medium, the kinematics, dynamics and evolution of galaxies, and cosmology and the synthesis of the chemical elements. Two one and one-half hour lectures per week.

Prerequisites: ESS 203, PHY 206.

Fall and spring, 3 credits each semester

ESS 345 Undergraduate Research in Astronomy

Student participation in faculty-directed research projects in the areas of theoretical and observational astronomy. Topics may include abundance analysis in stars, instrument design and construction, ionization balance in the interstellar medium.

Corequisite: ESS 342.

Spring, 1 credit

Staff

ESS 347 Solar System Astrophysics

A survey of current knowledge about the solar system, emphasizing the most recent results from ground-based observations and direct explorations. Among the topics covered are the following: methods of investigation; an introduction to solar physics; the solar wind and the interplanetary medium; the earth as a planet; composition, structure, and origin of planetary atmospheres; surfaces of Mars and the moon; the nature of satellites,

asteroids, comets, and meteorites; the problem of solar systems origin and evolution.

Prerequisites: MSM 152, PHY 154, PHY 206.

Fall, 3 credits

T. Owen

ESS 352 Geophysics

Survey of the earth's structure, composition, thermal regime, elastic and inelastic properties as revealed by physical measurements on the surface and on laboratory samples. Reviews the results of seismology, heat flow, earth gravity and magnetism, high-pressure geophysics and regional geophysics.

Prerequisite: MSM 151.

Spring, 3 credits

D. Weidner

ESS 363 Sedimentation and Stratigraphy

A study of sedimentary processes and products. Marine environments (platform, continental shelf, deep ocean), terrestrial environments (fluvial) and transitional environments (deltaic) will be examined in terms of sediment production and provenance, transport, deposition and structures produced. Identification and understanding of sediment grain properties and of sedimentary structures will be emphasized. Field trips will examine recent and ancient depositional settings. Three one-hour lectures and one three-hour laboratory per week.

Prerequisite: ESS 301.

Fall, 4 credits

W. Meyers

ESS 364 Marine Geology

Intensive study of modern theories of the ocean basins, the morphology, origin and evolution. Topics included are a quantitative discussion of waves and tidal currents and their effect on beaches and coastal features. Geophysical studies of continental margins, ocean basins and oceanic rises. Survey of sediments and sediment transport in the coastal and deep ocean areas. Sea floor spreading and continental drift. Three one-hour lec-

tures and one three-hour laboratory per week.

Prerequisites: ESS 102, 104.

Spring, 3 credits

G. Hanson

ESS 390 Teaching Practicum in Earth and Space Sciences

Supervision of laboratory or recitation sections of lower division courses under the close guidance of the course instructor. Includes regular meetings with instructor for purposes of planning and evaluation; supplementary reading in preparation for laboratory or recitation sessions; and opportunities to make oral presentations, prepare examinations, provide individual or innovative instruction, and reinforce previously acquired knowledge.

Prerequisites: Senior standing and previous preparation in subject field; interview and permission of instructor.

Fall and spring, 3 credits

Staff

ESS 398 Senior Tutorial in Earth and Space Sciences

Seminar courses in advanced topics may be arranged prior to the beginning of the semester. Topics to be discussed will be announced by the department, or students may petition for a particular topic. Weekly conferences will be held with a faculty member. May be repeated once.

Prerequisite: Permission of chairman.

Fall and spring, 1 to 3 credits

Staff

ESS 399 Senior Research

With the approval and supervision of a faculty member, a major in the department may conduct research for academic credit. A research proposal must be prepared by the student and submitted to the department chairman for approval before the beginning of the semester in which credit is to be given. A written report must be submitted before the end of the semester. May be repeated once.

Prerequisite: Permission of chairman.

Fall and spring, 1 to 3 credits

Staff

Graduate Courses

Qualified seniors may take 500-level courses with the permission of the department chairman. See *Graduate Bulletin*.

Department of Economics

Professors: Edward Ames, Richard Dusansky, Charles Hoffmann, Estelle James, Peter J. Kalman, Thomas Muench (*Chairman*), Egon Neuberger, H. O. Stekler

Associate Professors: Alan D. Entine (*Adjunct*), Eliyahu Kanovsky, Marvin M. Kristein, Charles E. Staley, Edward Van Roy, Dieter K. Zschock, Michael Zweig

Assistant Professors: Michael S. Denci (*Adjunct*), Michael J. Sattinger, Lois Stekler (*Part-time*), C. Robert Wichers, John Wile, Myrna Wooders

Lecturer: William S. Dawes

The undergraduate major in economics provides opportunities for exploring many elements of the processes of production, exchange, and distribution of goods and services. There are two separate programs which lead to the major in economics: the General Economics Program and the Managerial Economics Program. The General Economics Program is a flexible track designed to meet the needs of a variety of students. It is suitable, for instance, for those interested in a career in economics and as preparation for graduate training in economics, public policy or law programs. In this program, students will first take an introductory course presenting some of the basic problems of economics. Then the student is free to study in greater depth in a number of broad areas including: economic theory; mathematical and quantitative techniques appropriate to economics; political economy and the institutional and cultural setting of economic activity; economic development and comparative economic systems; and other courses which apply economic theory to specific problems.

The Managerial Economics Program is designed to provide students who are oriented to the managerial and administrative aspects of economics with an understanding of the economic processes of the managerial enterprise and the interaction of the economy with it. The tools necessary to provide this understanding will be taught in the required courses; consequently the Managerial Economics Program is more structured than is the General Economics Program. This program is suited for those interested in graduate training in management or business administration.

Mathematics and Economics

Students interested in economics may be interested in a mathematical treatment of some problems. The department does not require any mathematical training of majors, but a number of economics courses rely on mathematical tools. Students interested in these courses, beginning with ECO 215 and 216, should first take MSM 122 or MSM 123. Students planning graduate work in economics are urged to take one of these courses. More advanced work in mathematics may also be required for certain topics in economics. Advanced courses in mathematical economics, probability and statistics are offered by the Applied Mathematics and Statistics Department.

Requirements for the Major in Economics

In addition to the general University requirements for the Bachelor of Arts degree, the following courses are required for the major in economics:

A. The General Economics Program

A total of 30 credit hours in courses in economics, consisting of not more than eight credit hours of 100-level courses and including:

1. Any introductory economics course except ECO 114
2. ECO 211 or 215 Intermediate Microeconomic Theory
3. ECO 212 or 216 Intermediate Macroeconomic Theory

Majors may substitute up to six credit hours earned from MSA 210, MSA 250 or 251 and MSA 325 for a comparable number of credit hours of economics courses. Students who are planning to do graduate work in economics, or who expect to work in business, are strongly advised to take statistics, although this is not a requirement.

B. The Managerial Economics Program

Credits

1. Required courses in Economic Analysis
 - (a.) Any introductory economics course except ECO 114
 - (b.) ECO 261 Managerial Decision Making
 - (c.) ECO 262 The Economy and the Managerial Enterprise
 - (d.) ECO 304 Managerial Economics (recommended for senior year)13
2. Required courses in Quantitative Analysis
 - (a.) ECO 114 Economic Accounting
 - (b.) ECO 220 and 221 Introduction to Economic Statistics and Introduction to Econometrics11
3. Two Fields of Specialization

A field of specialization would consist of two related courses in a specific area. Examples are:

- (a.) Financial Markets:
ECO 201 (Money and Banking) and
ECO 264 (Corporate Finance)

(b.) Labor Markets:

ECO 237 (Industrial and Labor Relations) and
ECO 238 (Manpower Planning)

(c.) Operations Research:

MSA 210 (Operations Research I: Deterministic Models) and
MSA 325 (Operations Research II: Stochastic Models)

(d.) Accounting and Data Processing (Select 2):

MSC 101 (Introduction to Computer Science)
MSC 205 (Introduction to Business Data Processing)
ECO 263 (Managerial Accounting)

(e.) Behavioral Science:

PSY 250 (Organizational Psychology) and another course
to be selected with the approval of the student's
advisor

(f.) Government Public Policy (select 2):

ECO 233 (American Industry)
ECO 244 (Urban Economics)
ECO 302 (Stabilization Policy, Business Cycles and Fore-
casting)

(g.) Managerial Aspects of the Non Profit Sector

2 courses to be selected from course offerings in Urban
and Policy Sciences, the Health Sciences Center and the
Economics Department relating to the non profit sector and
approved by Undergraduate Committee.

(h.) Other fields of specialization are possible with approval
of the Undergraduate Committee.

Substitution Between Programs

For students selecting the General Economics track, ECO 263 and ECO 264 may not count towards the 30 required credit hours in courses in economics. Students may not count both ECO 211 and 261, or ECO 212 and 262 towards the 120 credits required for the B.A. degree. Credit for either ECO 261, in lieu of 211 or 215, and ECO 262 in lieu of ECO 212 or 216, would be acceptable for the General Economics Program only if the student takes one additional economic theory course from the following set of courses: ECO 215, ECO 216, ECO 316.

For students selecting the Managerial Economics Program, ECO 211 or ECO 215 may be substituted for ECO 261; ECO 212 or ECO 216 may be substituted for ECO 262.

Exemption and Challenge Program

Students who wish to exempt a particular course or to participate in

the Challenge Program should consult members of the Department's Undergraduate Program Committee.

Honors Program in Economics

The honors program in economics consists of a three-semester sequence of seminar courses, ECO 396, 397 and 398, beginning in the second semester of the junior year.

Students in the junior honors seminar will be expected to consider problems of economic theory and policy in a seminar setting, under the supervision of the instructor and each other. Intensive work to develop writing skills and critical ability will be stressed through the preparation of many short papers. These papers will be carefully evaluated by the instructor and other students.

In the senior honors seminar the student will be responsible for preparing a major paper of scholarly article length and quality. This will be the senior honors thesis. The identification of manageable topics, preparation of research designs and regular progress reports will be the work of students in the senior honors seminar. Students will be expected to enroll simultaneously for independent study (ECO 393 or 394) with the faculty member in the Economics Department, who will supervise the detailed work of the senior honors thesis. The independent study proposal will be evaluated by the economics faculty directly involved with the honors program as well as by the individual faculty sponsor.

Eligibility. A student will be admitted into ECO 396 Junior Honors Seminar if he or she has successfully completed ECO 211 or 215, and 212 or 216.

A student will be admitted into the year-long ECO 397, 398 Senior Honors Seminars on the recommendation of the members of the Undergraduate Program Committee and seminar instructors. In exceptional cases, a student with appropriate prerequisites may be admitted to ECO 397, 398 on the basis of non-honors course work and examples of prior written work without having taken ECO 396.

Graduation with honors will be upon the recommendation of the Undergraduate Program Committee and seminar instructors. To graduate with honors, a student must have a grade point average of 3.3 or better in all economics courses including honors seminars and must complete an acceptable honors thesis.

Application. The students should indicate to the Undergraduate Program Committee their intentions to enroll in the honors program before the beginning of the semester in which they will enter the program, indicating the particular areas of research and the faculty members who have agreed to supervise the honors theses.

Administration. This program will be supervised by the Undergraduate Program Committee and may be reviewed annually by the department.

Courses*

ECO 101 Introduction to Economic Analysis

This course serves as an introduction to economic analysis. Microeconomics (the study of individual, firm, industry, and market behavior) and macroeconomics (the study of the determination of national income, employment, inflation) are stressed. Certain important topics (economics of education, urban economics, economic systems of other countries) will be analyzed utilizing the traditional tools of micro- and macroeconomics.

Fall and spring, 4 credits

W. Dawes, E. Neuberger

ECO 103 Economic Problems of the Environment

An analysis of the environmental problems associated with economic growth and development such as pollution and conservation and the economic means of affecting these problems.

Spring, 4 credits

H. Stekler

ECO 105 Introduction to Political Economy

Study of the basic elements of the capitalist system of production and distribution. Microeconomics (price determination and market behavior) and macroeconomics (inflation, employment) are discussed in the context of an investigation of capitalism as a system of social relations. Topics also include class structure, exploitation, alienation, the role of the state, and an introduction to the principles of capitalist development. Main examples are drawn from the United States.

Fall, 4 credits

M. Zweig

ECO 114 Economic Accounting

Introduction to some formal accounting statements commonly involved in eco-

omic analysis. Topics include business balance sheet and profit and loss statements, national and regional income and product statements, national and regional input-output transaction tables, and flow of funds accounting.

Fall and spring, 3 credits

E. Van Roy

ECO 122 Economics of Socialism

Analysis of the various approaches to the problems of translating Marxian socialist principles into functional economic institutions. Theoretical issues of socialism will be stressed, but will be illustrated with examples taken from the experience of various communist countries.

Spring, 4 credits

E. Neuberger

ECO 201 Money and Banking

An introduction to modern monetary institutions and mechanisms, their relationship to the economy and governmental policies in this area.

Prerequisite: Any 100 level economics course except 114.

Fall, 3 credits

M. Kristein

ECO 203 History of Economic Thought

A study of the evolution of economic thought with reference to the basic problems of the discipline: factor allocation, distribution, growth, etc. The major schools are emphasized in the survey.

Prerequisite: Any 100 level economics course except 114.

Fall, 3 credits

C. Staley

ECO 210 International Economics

Economic theory of international trade, protection, commercial policy, customs unions, capital movements and interna-

*See p. 75, Information About Course Credit/

tional finance.

Prerequisite: Any 100 level economics course except 114.

Fall, 3 credits

L. Stekler

ECO 211 Intermediate Microeconomic Theory

Economic theory of cost, demand, price and market. The application of theory to familiar problems is emphasized.

Prerequisite: Any 100 level economics course except 114.

Fall and spring, 4 credits

ECO 212 Intermediate Macroeconomic Theory

The theory of national income determination, employment, distribution, price levels and growth.

Prerequisite: Any 100 level economics course except 114.

Fall and spring, 4 credits

ECO 215 Intermediate Mathematical Microeconomic Theory

Same as ECO 211 but developed in mathematical terms.

Prerequisites: Any 100 level economics course except 114, MSM 122 or 123.

Fall, 4 credits

M. Wooders

ECO 216 Intermediate Mathematical Macroeconomic Theory

Same as ECO 212 but developed in mathematical terms.

Prerequisites: Any 100 level economics course except 114, MSM 122 or 123.

Spring, 4 credits

M. Wooders

ECO 220 Introduction to Economic Statistics

An introduction to elementary statistical measures and some of their properties. Topics include: measures of central tendency; measures of dispersion; elementary statistical inference. Regular problem sets

are required. A student may receive credit for only one of the following courses: MSA 250, MSA 252, ECO 220.

Fall, 4 credits

W. Dawes

ECO 221 Introduction to Econometrics

A continuation of ECO 220 covering elementary problems of simple and multivariate regression, analysis of variance and hypothesis testing. Regular problem sets are required.

Spring, 4 credits

W. Dawes

ECO 223 Logical Foundations of Quantitative Economics

An inquiry into the logical and semantic problems of quantitative economics with special emphasis on the empirical interpretation and quantification of economic theories and hypotheses. Topics include: economic languages; logic of theories, concrete interpretation, logical structure of explanatory economic hypotheses; elementary theory of quantity and measurement, empirical basis of measurement in economics.

Prerequisite: Any 100 level economics course except 114.

Fall, 3 credits

ECO 225 Economic Development

An examination of problems and prospects, facing developing countries in the transition from traditional, predominantly rural economic systems to modern, largely urban-oriented economies. Theories of economic growth and development will be presented in the light of the actual experience of developing countries.

Prerequisite: Any 100 level economics course except 114.

Fall, 3 credits

D. Zschock

ECO 233 Economics of American Industry

Application and extension of the theory of the firm to actual firms and industries, emphasizing problems which might call

for various sorts of regulation of firms. Topics include market concentration, applications of the theories of monopoly and oligopoly, mergers, price discrimination, product variation, advertising, public utility pricing, with illustrations from specific industries.

Prerequisite: ECO 211 or 215.

Fall, 3 credits

ECO 235 Economic History of the United States

A survey of the United States economy from colonial times to the present. The changing structure of the economy is analyzed using the standard tools of the economist to throw light on the factors determining changes in factor inputs, institutional arrangements, prices and money, balance of payments and government policy.

Prerequisite: Any 100 level economics course except 114.

Spring, 3 credits

W. Dawes

ECO 237 Economics of Industrial and Labor Relations

Evolution of labor unions and collective bargaining, with an emphasis on current labor problems, union and non-union; and of the changing composition of the labor force, wage differentials, the theory of wage determination, labor legislation and unemployment.

Prerequisite: Any 100 level economics course except 114.

Fall, 3 credits

E. Kanovsky

ECO 238 Economics of Manpower Planning

Analysis of changing manpower requirements and labor force composition in the United States. Evaluation of manpower legislation and programs at national, regional and local levels, and of educational and other institutional responses to employment problems.

Prerequisite: Any 100 level economics course except 114.

Spring, 3 credits

D. Zschock

ECO 241 Political Economy of the United States

The method of dialectical and historical materialism is developed and applied to the functioning of an advanced, monopoly capitalist economy. Topics include: the nature and foundations of imperialism; the implications of class society for macroeconomic policies related to employment and inflation; government "regulation" of industry; the mechanisms for the reproduction of class society over time in capitalism; and the dynamics of capitalism which lead to change in the economic system.

Prerequisite: Any 100 level economics course except 114.

Fall, 3 credits

M. Zweig

ECO 243 Comparative Economic Systems

A study of different types of economic systems, comparing structures, the ways basic economic problems of factor allocation and distribution are dealt with and the result achieved in output and growth.

Prerequisite: Any 100 level economics course except 114.

Spring, 3 credits

E. Neuberger

ECO 244 Urban Economics

Theories of residential and industrial location; examination of intrametropolitan changes in industry location, suburbanization of employment and population and ethnic problems in metropolitan areas; costs and benefits of urban services and policy formation for urban development and renewal.

Prerequisite: Any 100 level economics course except 114.

Spring, 3 credits

J. Wile

ECO 261 Managerial Decision Making

Economic analysis of the decision processes of the managerial enterprise including product pricing, determination of costs of production and output. The principles are illustrated with applications from relevant managerial decisions. (ECO 211 or 215 and 261 may not both

be counted for credit.)

Prerequisite: Any 100 level economics course except 114.

Fall, 3 credits

ECO 262 The Economy and the Managerial Enterprise

Analysis of the way the behavior of the economy affects the managerial enterprise. The role of government policy and economic forecasting in affecting the behavior of the economy will also be examined. (ECO 212 or 216 and 262 may not both be counted for credit.)

Prerequisite: Any 100 level economics course except 114.

Fall, 3 credits

ECO 263 Managerial Accounting

Concepts, theories and use of the accounting system as a source of information in the planning, control, and evaluation of the enterprise by the manager. Cash and funds flow analysis, budget development and cost control mechanisms.

Prerequisite: ECO 114.

Fall and spring, 3 credits

M. Denci

ECO 264 Corporation Finance

The corporation as a social and economic institution for raising capital and organizing economic activity, emphasizing financial decision-making. The birth, operation, growth, and death of corporations; risk-taking and control; sources and uses of funds, financial management; mergers, acquisitions, conglomeration; reorganization, bankruptcy; regulation; public responsibility.

Prerequisite: ECO 201.

Fall, 3 credits

M. Kristein

ECO 284 Topics in Area Studies

One or more sections of this course will be offered each semester, depending on student and faculty interest, to explore economic characteristics of major world areas.

Section 1: The Economy of China

Section 2: Economic Development in Latin America

Section 3: Economic Development in Southeast Asia

Section 4: Economic Development in the Middle East

Section 5: Soviet and Eastern European Economics

Other sections may be offered at the discretion of the department.

Prerequisite: Any 100 level economics course except 114.

3 credits, course repeatable for different sections

ECO 300 Monetary Theory and Policy

The influence of the quantity of money on economic systems and on policies employed by central banks to control the supply of money as an instrument for achieving various economic policy objectives. Emphasis on the development of monetary theory and policy: the quantity theory; liquidity preference theory; money as an asset; empirical research on the demand for money; monetary dynamics.

Prerequisites: ECO 201, 211 or 215, 212 or 216.

Fall, 3 credits

L. Stekler

ECO 302 Stabilization Policy, Business Cycles, and Forecasting

Analysis of short-run cyclical fluctuations and stabilization policies. Types of policies and the effect of forecasting upon public policy.

Prerequisite: ECO 212 or 216.

Spring, 3 credits

H. Stekler

ECO 303 Public Finance

Theories of taxation and the satisfaction of public wants. The nature of public goods. Theory of public expenditure. Effects of taxes on resource allocation and welfare. Theories of tax incidence. Fiscal and equity implications of alternative tax schemes. Fiscal dynamics and growth. Intergovernmental fiscal relations.

Prerequisite: ECO 211 or 215.

Spring, 3 credits

ECO 304 Managerial Economics

Theoretical and empirical analyses of the behavior of business firms. Decision-making under certainty and uncertainty; conflicts between owners and managers; cost curves and pricing policies of the multi-product, multi-plant firm.

Prerequisite: ECO 211 or 215 or 261.

Fall, 3 credits

M. Sattinger

ECO 306 Theory of Welfare Economics

Analysis of the method, meaning and implications of modern welfare economics. Major topics to be covered include: the concept of Pareto-optimality, efficiency and equity under competitive equilibrium, causes of market failure, welfare under government planning, the measurement of social welfare and applications to intertemporal resource allocation.

Prerequisite: ECO 211 or 215.

Spring, 3 credits

E. James

ECO 314 International Economic Theory

An intensive study of the theory of international trade and finance, emphasizing comparative advantage theories, the analysis of tariffs and other trade restrictions, common markets and economic integration, the balance of payments and theories of international monetary arrangements.

Prerequisites: ECO 210, 211 or 215, 212 or 216.

3 credits

ECO 316 Advanced Mathematical Macroeconomics

Selected topics in the theory of general economic equilibrium, and its application to macroeconomics, such as input-output, applications of control theory to economic problems, econometric models.

Prerequisites: MSM 122 or 123, ECO 216.

3 credits

ECO 320 Mathematical Statistics

An introduction to statistical methods and their properties which are useful in analysis of economic data. Topics include: elements of probability theory and its empirical application; univariate and multivariate distributions; sampling distributions; limiting distributions; point and interval estimation. Regular problem sets and occasional projects are required.

Prerequisite: Any 100 level economics course except 114, or MSM 122 or 123.

Fall, 4 credits

ECO 321 Econometrics

The application of mathematical and statistical methods to economic theory. Topics include: concept of an explanatory economic model; multiple regression; hypothesis testing; simultaneous equation models and estimating techniques. Emphasis is placed on the application of econometric methods to economic issues and the interpretation of various econometric studies.

Prerequisite: ECO 320 or MSA 250.

Spring, 4 credits

C. Wichers

ECO 330 Economic Anthropology

A critical examination of theories and controversies regarding economic behavior and institutions in various societies, with a view to identifying the cross-cultural applicability of economic theory. The interdisciplinary relevance of economics, anthropology and sociology will be stressed.

Prerequisite: Any 100 level economics course except 114.

Spring, 3 credits

E. VanRoy

ECO 331 Mathematical Economics I

Application of set theory, metric spaces and topology to the theory of consumer choice, utility and production; neo-classical demand and production theory; revealed preference and integrability; input-output models. The notions of set theory, metric spaces and topology will be developed as needed. This course is

identical with MSA 333.

Prerequisites: MSM 152 and 201.

Spring, 3 credits

P. Kalman

ECO 332 Mathematical Economics II

Convex sets, functions, cones and fixed point theorems and their application to economic theory; general equilibrium theory; concepts of N-person games applied to the core; Lyapunov stability in economics.

Prerequisite: ECO 331.

Spring, 3 credits

P. Kalman

ECO 345 Law and Economic Issues

This course will consider the American system of law as the context within which resources are allocated, prices set and income and wealth produced and distributed. The liability of oil companies for damages to beaches and real estate values, the responsibilities of manufacturers for injuries to persons and property, and the role of tax law in land use and industrial investment will serve as examples of the fashion in which law and economic choice combine to shape the directions in which resources flow and the economy grows.

Prerequisite: ECO 211 or 215.

Fall, 3 credits

ECO 346 Law and Poverty

Continuing the analysis of ECO 345, this course will focus particularly upon the relations between economic poverty and legal arrangements. Among the topics to be examined will be the extent of the protection afforded by law to small debtors and poor tenants, the impact of welfare law upon the economic situation of the poor, the impact of the law of local government upon the fiscal situation of the large cities and the adequacy of legal remedies for housing segregation. The large question which runs through the semester's work concerns the degree to which legislation and common law reinforce the existing distribution of income and wealth.

Prerequisite: ECO 345.

Spring, 3 credits

ECO 361 Human Resources I, Education

Education as investment in human capital with concurrent problems of individual decision-making about the optimal level of education; the public and private benefits and costs of education, and the divergence between public and private optimizing of investment levels; education and growth; educational planning.

Prerequisite: ECO 211 or 215.

Fall, 3 credits

M. Sattinger

ECO 362 Human Resources II, Selected Topics

A consideration of selected topics in the human resources area, such as demography, migration, manpower, health and poverty.

Prerequisite: ECO 211 or 215; Human Resources I is not a prerequisite.

Spring, 3 credits

M. Sattinger

ECO 363, 364 Workshop in Human Resources

Research seminar in the economics of human resources. Students will work on individual or joint projects and present papers.

Prerequisite: ECO 361 or 362.

Fall and spring, 3 credits each semester

ECO 371 Microeconomic Cybernetics

An alternative (mechanistic) description of economic behavior, with emphasis on quantitative aspects and verifiability. Topics include: shape of the demand and supply functions; effects of interaction among economic agents (conspicuous consumption, interdependent utilities); a reconsideration of the nature and role of money, prices, commodities.

Prerequisites: MSM 151 or some knowledge of linear algebra.

Fall, 3 credits

C. Wichers

ECO 380 Topics in Economy Theory

Topics in economic theory will be offered as student demand and faculty time and interest coincide. Some of the possible semester sections include: optimization theory; growth theory; investment determination; advanced micro theory. Students should check with department faculty for information about sections to be offered in any particular semester.

Prerequisites: Vary with individual sections.

Credit variable, course repeatable for different sections

ECO 382 Topics in Quantitative Economics

Topics in quantitative economics will be offered as student demand and faculty time and interest coincide. Some of the possible semester sections include: forecasting with econometric models; time series and spectral analysis; decision theory; game theory. Students should check with department faculty for information about sections to be offered in any particular semester.

Prerequisites: Vary with individual sections.

Credit variable, course repeatable for different sections

ECO 384 Topics in Development and Comparative Systems

Topics in development and comparative systems will be offered as student demand and faculty time and interest coincide. Some of the possible semester sections include: economic development in modern Europe; China; Southeast Asia; Soviet and Eastern European economies; economic development in the Middle East; Latin America. Students should check with department faculty for information about sections to be offered in any particular semester.

Prerequisites: Vary with individual sections.

Credit variable, course repeatable for different sections

ECO 386 Topics in Political Economy

Topics in political economy will be offered as student demand and faculty

time and interest coincide. Some of the possible semester sections include: imperialism; political economy of Latin America; property relations. Students should check with department faculty for information about sections to be offered in any particular semester.

Prerequisites: Vary with individual sections.

Credit variable, course repeatable for different sections

ECO 388 Topics in Applied Economics

Topics in applied economics will be offered as student demand and faculty time and interest coincide. Some of the possible semester sections include advanced topics in economics of education; capital and financial markets; medical economics. Students should check with department faculty for information about sections to be offered in any particular semester.

Prerequisites: Vary with individual sections.

Credit variable, course repeatable for different sections

ECO 393, 394 Independent Study or Research

A course of study providing opportunities for a student to undertake independently a special project entailing advanced readings, reports and discussion or research on topics or problems of his choosing and with the guidance of an assigned faculty member. When two or more students' work in this course is related, a seminar may be organized covering the area of common interest.

May be repeated.

Prerequisite: Permission of department.

1 to 6 credits.

ECO 395 Undergraduate Teaching Practicum in Economics

Each student will conduct a regular recitation or problem section that will supplement a regular economics course. The student will receive regularly scheduled supervision from the instructor. Responsibilities may include: preparing material for discussion, initial correction of

homework and tests, and helping students with problems.

Prerequisite: Upper division economics major, preferably senior standing, and permission of instructor.

Fall and spring, 3 credits

ECO 396 Junior Honors Seminar

Students will consider problems of economic theory and policy in a seminar setting. Intensive work to develop writing skills and critical ability will be stressed through the preparation of many short papers.

Prerequisites: ECO 211 or 215; and 212 or 216.

Spring, 3 credits

ECO 397, 398 Senior Honors Seminar

The student will be responsible for preparing a major paper of scholarly article length and quality, the senior honors thesis. The identification of manageable topics, preparation of research designs and regular progress reports will be the work of students in the seminar. Each student will be expected to enroll simultaneously for ECO 393, 394 Independent Study with a faculty member in the Economics Department who will supervise the detailed work of the honors thesis.

Prerequisite: Permission of the department.

Fall and spring, 3 credits each semester

Interdisciplinary Program in Elementary Education

The Interdisciplinary Program in Elementary Education is being phased out; no more majors are being accepted. All students must finish the program and apply for provisional certification by August 31, 1977. Students on file as Elementary Education majors before academic year 1976-77 will be able to fulfill this major. Students with questions about their status in the program should consult the program coordinator.

Supervised student teaching will be offered in 1976-77. Assignments to a school district are made by the department. Students entering this program are advised that transportation during the semester of student teaching is the responsibility of the student. No student teaching assignments are available during the summer session.

Courses

The following three courses must be taken as an 18-credit sequence during the same semester.

EDU 352 Supervised Elementary School Student Teaching

Prospective elementary school teachers will receive supervised practice in teaching by arrangements with selected Long Island elementary schools. The student

teacher reports to the school to which he is assigned for a full school day for the semester. Frequent consultation with the supervising teacher and seminar meetings with a University faculty member help the student to interpret and evalu-

*See p. 75, Information About Course Credit.

ate his student teaching experience. Applications must be filed in the semester preceding that in which the student plans to student teach. The dates by which applications must be completed will be announced.

Prerequisites: EDU 330, 351, 364 senior standing, and approval of the program.
Fall and spring, 12 credits

EDU 355 Student Teaching Seminar (Elementary Education)

Seminar on problems and issues of teaching at the elementary school level. Analysis of actual problems and issues encountered by the student in his student teaching experience.

Corequisite: EDU 352.

Fall and spring, 3 credits

EDU 365 Workshop in Teaching Reading for Elementary School Teachers

An investigation into newer methods and materials of teaching reading with special emphasis on: diagnostic concepts and tools; the impact of socio and psycholinguistics on reading; the role of the parent in the reading process; the role of the teacher in the reading process; the teacher-pupil relationship; grouping patterns in the school and classroom; methods and materials for culturally diverse populations; programs for beginning readers; reading in the content fields; word attack skills in proper perspective; comprehension and critical reading skills.

Prerequisite: Permission of instructor.

Corequisite: EDU 352.

Fall and spring, 3 credits

Interdisciplinary Program in Engineering Chemistry

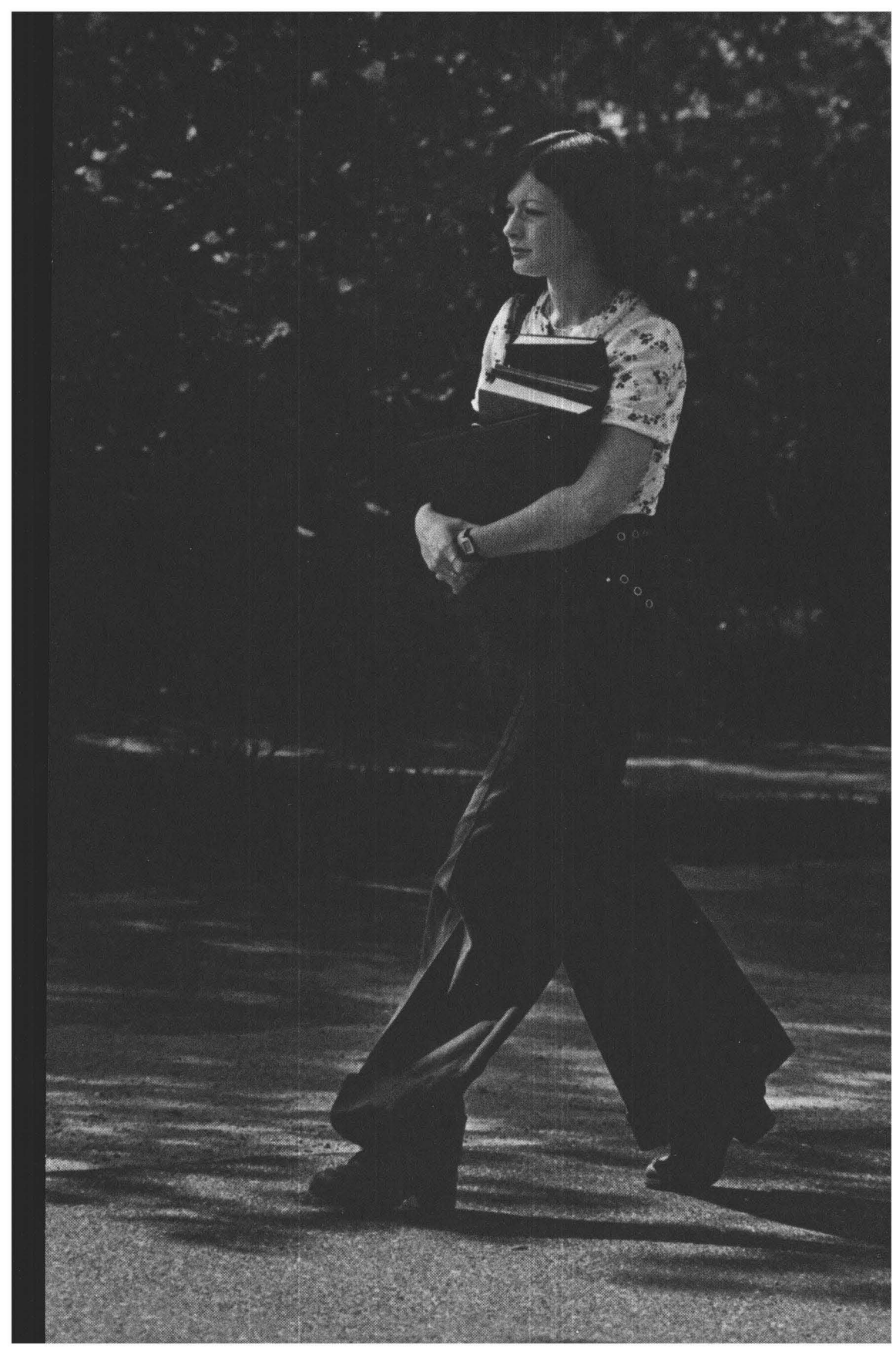
Program Committee: Patrick Herley—Materials Science, Robert Kerber—Chemistry

The interdisciplinary program in engineering chemistry is designed to provide students with a basic understanding of the chemistry and materials technology underlying modern materials engineering.

This program emphasizes a strong background in physical chemistry infused with an orientation toward the solid state sciences and materials technology. Its central theme is a chemistry core strengthened by materials science and laboratory courses, the latter with a unique "Chemistry of Materials" component. The choice of suitable electives will enable the student to emphasize such different aspects of solid state sciences as polymeric materials, modern industrial processes, mineral resources, biomaterials, etc.

The program is a basic preparation for training chemical-materials engineers who can enter a wide range of industries or proceed to graduate work in either solid state chemistry or materials science.

Students interested in this program should consult members of the program committee for details.



Department of English

Professors: Thomas J. J. Altizer, David V. Erdman, Donald K. Fry, Homer B. Goldberg, Harvey Gross, Jan Kott, Thomas Kranidas, Richard L. Levin, Richard A. Levine (*Chairman*), Jack Ludwig, Ruth Miller, Louis Simpson, Judah L. Stampfer, Martin Stevens, John A. Thompson, Herbert Weisinger

Associate Professors: Kofi Awoonor, Betty T. Bennett (*Adjunct*), Joseph T. Bennett (*Director of Graduate Studies*), Paul J. Dolan, Edward Fiess (*Director of M. A. Programs*), Clifford C. Huffman, Thomas E. Maresca, Gerald Nelson, Joseph Pequigney, Thomas Rogers (*Director of Writing Programs*), Sallie Sears, Peter Shaw, Alice S. Wilson, Rose Zimbardo

Assistant Professors: Miriam Baker, Bruce W. Bashford (*Director of Undergraduate Studies*), Diane Fortuna, Howard J. Harvey, Peter J. Houle, Paul A. Newlin, Richard A. Rand, Kathleen M. Schwartz, David R. Sheehan, Stephen J. Spector, Norman R. Wallis

Lecturer: Martin Buskin

Requirements for the Major in English

In addition to the general University requirements for the Bachelor of Arts degree, including proficiency in English composition, the following courses are required for the major in English:

	<i>Credits</i>
1. EGL 237 Literary Analysis and Argumentation, which should be taken as an introduction to the major study	3
2. EGL 238 and 239 Survey of British Literature, which should be taken in the sophomore year	6
3. EGL 241 Shakespeare	3
4. Eight additional English courses distributed as follows:	
a. Period: Four courses from the sequence numbered EGL 200-222, with at least one of the courses in American Literature, EGL 216-222	12
b. Major Authors: One course from the sequence numbered EGL 240-259, exclusive of EGL 241 Shakespeare	3
c. Genre or Interdisciplinary: One course from the sequence numbered EGL 260-279	3
d. EGL 281 History and Structure of the English Language	3

e. Elective:

One additional course elected from those offerings numbered
EGL 200-300

3

Total 36

Note: 1. Appropriate EGL 300 seminars may be used to satisfy the above requirements by permission of the Director of Undergraduate Studies.

2. Courses to fulfill requirements 1 through 4 must be taken for letter grade.

5. One year (or its five-credit equivalent) of college study of a foreign language at the intermediate level or beyond. (May be taken under the P/NC option.)

6. One year (six credit) of study of British and/or American and/or medieval history. (History courses in other areas may be elected with the approval of the Director of Undergraduate Studies in English.) Students are advised to elect history courses that complement their major literary interests. These six credits of history may also be used to fulfill the general University social and behavioral sciences requirement and may be taken under the P/NC option.

Note: English majors *may not* fulfill their general University humanities requirement of six credits with English courses, or with foreign language courses at the intermediate level or below; English majors must take six hours of study in an area of the humanities outside of the English Department. (May be taken under the P/NC option.)

Teacher Certification

Students majoring in English and seeking provisional certification as secondary school English teachers are required to have a departmental advisor. They are asked to consult with the Director of Undergraduate Studies as soon as they have decided to seek certification.

Requirements for Certification

1) All Requirements for the Major*

2) Professional Educational Requirements

a. Three pre-professional courses in Education. 9

It is recommended but not required that EGL 290, Methods of Instruction in Literature and Composition, be a course selected to satisfy this requirement.

b. Supervised secondary school student teaching 12

c. A student teaching seminar 3

d. A drug and alcohol abuse education course
(number and credits to be announced)

*Note: A student not majoring in English but having as part of his B.A. degree 36 credits in English may also apply for certification. For details consult the Office of Teacher Certification on campus.

Courses*

Most of the courses described below are offered every semester, unless otherwise indicated, but details of staffing and specific course descriptions should be obtained from schedules published by the English Department before registration each semester. Reading lists are also available in advance.

A student may repeat certain courses when the content varies. For example, EGL 248 Major Writers of the Romantic Period in England will have a changing course content which can be appropriately recorded on the student's transcript. In doubtful cases, the student should consult a departmental advisor before registering.

Special Courses in Language and Composition

EGL 091 English as a Second Language I

This course emphasizes the skills involved in listening to and speaking English. A prior study of English is essential, as the course is geared to students of the intermediate/advanced level. Three contact hours weekly, plus some outside preparation in pronunciation practice, listening and understanding skills, vocabulary and idiom drill, guided and free conversation, American society. Any student at the University who is at the level mentioned above may take the course. For details, consult the Office of Special Programs.

No credit toward academic requirements
S. Chanover

EGL 092 English as a Second Language II

This course is designed especially for students who may have a high degree of facility in speaking English but who need more work in reading and writing skills. Beginning with paragraph structure and moving to longer themes, each

student has the opportunity to practice many different facets of formal writing. At least one writing assignment is required weekly. Additional work is given in response to individual student needs. For details, consult the Office of Special Programs.

No credit toward academic requirements
S. Chanover

EGL 100 Developmental English

This course is designed to meet the needs of students who require intensive training in language skills prior to entrance into EGL 101. The syllabus will emphasize written skills but will also include audio-visual aids so as to create a fully rounded language experience. As the course develops, students will have an opportunity to participate in the preparation of some of the class material. May be repeated, but students may not receive credit for this course and AIM 102.

Prerequisite: Permission of department after review of scores on diagnostic tests.
Fall or spring, 1 to 6 credits per semester

I. Courses in Writing

Note: None of the courses in this section may be used for English major credit.

EGL 101 Composition

A course in writing. The course aims to develop abilities in expository and argumentative writing and must be taken, normally in the freshman year, to satisfy

the University requirement for proficiency in English composition. Through the writing and revision of frequent short papers, the student is expected to become competent in the conventions of

*See p. 75, Information About Course Credit.

written English and to gain practice in the logical and clear expression of ideas and the exposition of facts and opinions.
Fall and spring, 3 credits
Staff

EGL 102 Advanced Composition

Students will work on advanced problems in exposition, argument, rhetoric and style through writing and discussion of their own papers as well as analysis of prose texts.

Prerequisite: EGL 101.

Fall and spring, 3 credits

Staff

EGL 105 Writing Workshop: Fiction

A workshop in the development of writing fiction through practice supplemented by readings.

Prerequisite: Permission of instructor.

Fall and spring, 3 credits

EGL 106 Writing Workshop: Poetry

A workshop in the development of skills in writing poetry. Poetry writing is supplemented by readings.

Prerequisite: Permission of instructor.

Fall and spring, 3 credits

(For additional offering in creative writing, see EGL 269)

EGL 107 The Exposition of Ideas: Journalism I

Training in journalistic exposition through practical application supplemented by readings.

Prerequisite: Permission of instructor.

Fall and spring, 3 credits

III. Introduction to the English Major

These courses should be taken by the major before he elects advanced courses in literature. They may also be of interest to the non-major. For each course the prerequisite is sophomore standing.

EGL 237 Literary Analysis and Argumentation

An introduction to the techniques and terminology of close literary analysis and argumentation as applied to poetry, fic-

EGL 108 The Exposition of Ideas: Journalism II

Advanced instruction in journalistic techniques with emphasis upon how make-up influences opinion and creates reader impact.

Prerequisite: EGL 107.

Fall and spring, 3 credits

M. Buskin

For additional offerings in journalism, see INT 298, 299 under Program in Communications in Society.

II. Introduction to Literature

EGL 191 Introduction to Poetry

Intensive analysis of poems in English of various periods and types and varying complexity. (Not for English major credit)

Fall and spring, 3 credits

Staff

EGL 192 Introduction to Fiction

Analysis of stylistic and structural modes employed by various writers of short stories and novels. (Not for English major credit)

Fall and spring, 3 credits

Staff

EGL 193 Introduction to Drama

Introduction to the analysis of the drama, emphasizing the literary more than the theatrical dimension of the works, through examination of a range of plays from a variety of genres and periods. (Not for English major credit)

Fall and spring, 3 credits

tion and drama; the course will include frequent demanding writing assignments and is designed for students beginning their major study in English.

Prerequisite: EGL 101.

Fall and spring, 3 credits

EGL 238 Survey of British Literature

The study of British literature from the Old English period to Milton.

Fall and spring, 3 credits

EGL 239 Survey of British Literature

The study of British literature from Dryden to the present.

Fall and spring, 3 credits

IV. The Literary Tradition of England and America

These courses are directed toward an understanding of the various periods of English and American literature. They include study of both major and minor authors, with attention to developments in theme and style and consideration of intellectual and social history. Detailed course descriptions and reading lists are provided for each course before registration. For each course the prerequisite is sophomore standing.

EGL 200 Old English Literature

The study of English literature from its beginnings to the 11th century.

Fall or spring, 3 credits

D. Fry, S. Spector

EGL 210 Neo-Classical Literature in English

The study of English Literature from about 1700 to 1790.

Fall or spring, 3 credits

H. Goldberg, T. Maresca, D. Sheehan

EGL 202 Medieval Literature in English

Major authors, themes, and forms of British literature from the 13th to the early 16th century, generally excluding Chaucer.

Fall or spring, 3 credits

P. Houle, S. Spector

EGL 212 Romantic Literature in English

The study of English literature from the end of the Neo-Classical period to the Victorian Age, 1798-1832.

Fall and spring, 3 credits

M. Schwartz

EGL 204 Renaissance Literature in English

The study of English literature of the 16th century.

Fall or spring, 3 credits

C. Huffman, P. Houle

EGL 214 Victorian Literature

The study of English literature of the Victorian Age from the end of the Romantic period to World War I.

Fall and spring, 3 credits

J. Bennett, R. Levine

EGL 206 English Literature of the 17th Century

The study of English literature from late Renaissance to the Age of Dryden.

Fall or spring, 3 credits

T. Kranidas, J. Pequinney

EGL 216 American Colonial and Federal Writers

The study of American literature from its beginnings to about 1800.

Fall or spring, 3 credits

P. Shaw

EGL 208 The Age of Dryden

The study of the English literature of the Restoration period.

Fall or spring, 3 credits

D. Sheehan, N. Wallis

EGL 218 The New England Imagination

The study of American literature from about 1800 to the Civil War.

Fall and spring, 3 credits

E. Fiess, P. Newlin, P. Shaw

EGL 222 The Realist Movement in America

The study of American literature from the Civil War to World War I.

Fall and spring, 3 credits

E. Fliess, D. Fortuna, P. Newlin

EGL 224 Modern English and American Literature

The study of English and American literature from the end of the Victorian era to World War II.

Fall and spring, 3 credits

G. Nelson, S. Sears

EGL 226 Contemporary English and American Literature

The study of English and American lit-

erature from World War II to the present.

Fall and spring, 3 credits

J. Ludwig, J. Thompson

EGL 237 Literary Analysis and Argumentation

(See Section III, Introduction to the English Major, for description.)

EGL 238 Survey of British Literature

(See Section III, Introduction to the English Major, for description.)

EGL 239 Survey of British Literature

(See Section III, Introduction to the English Major, for description.)

V. Major Authors

These courses deal intensively with the work of one or two writers at a time. An author representative of a period is not likely to be treated more often than every other year. EGL 244 through 253 may be repeated for credit with permission of the Director of Undergraduate Studies as the subject matter differs. For each course the prerequisite is sophomore standing.

EGL 240 Chaucer

Fall or spring, 3 credits

S. Spector

EGL 241 Shakespeare

Fall and spring, 3 credits

C. Huffman, R. Levin, J. Stampfer

EGL 242 Milton

Fall or spring, 3 credits

T. Kranidas, J. Pequigney

EGL 244 Major Writers of the Renaissance Period in England

3 credits

C. Huffman, P. Houle

EGL 245 Major Writers of the 17th Century in England

3 credits

T. Kranidas, J. Pequigney

EGL 246 Major Writers of the Restoration Period in England

3 credits

R. Zimbaro

EGL 247 Major Writers of the Neo-Classical Period in England

3 credits

H. Goldberg, T. Maresca, D. Sheehan

EGL 248 Major Writers of the Romantic Period in England

3 credits

D. Erdman, R. Rand, M. Schwartz

EGL 249 Major Writers of the Victorian Period in England

3 credits

J. Bennett, R. Levine

EGL 250 Major Writers of American Literature

3 credits

E. Fiess, P. Newlin

EGL 252 Major Writers of Modern British and American Literature

3 credits

D. Fortuna, S. Sears

EGL 253 Major Writers of Contemporary British and American Literature

3 credits

G. Nelson, J. Ludwig, J. Thompson

VI. Genre and Special Topics Courses

These courses cover the various literary kinds and the relations between literature in English and other disciplines and literatures. They also examine literature in an interdisciplinary perspective. Detailed information on course content is published by the English Department before registration each semester. Reading lists are also available in advance. EGL 261 through 269 and EGL 272, 274, and 276 may be repeated for credit with permission of the Director of Undergraduate Studies as the subject matter differs. For each course the prerequisite is sophomore standing.

EGL 260 Mythology in Literature

The study of the dissemination and use of mythological motifs and themes in English and American literature.

Fall and spring, 3 credits

A. Wilson

EGL 261 The Bible as Literature

The study of literary forms and themes in the Bible. The Old and New Testaments will be treated in alternate semesters.

Fall and spring, 3 credits

J. Stampfer

EGL 262 Poetry in English

The study of the development of form, theme and language of poetry in English.

Fall and spring, 3 credits

L. Simpson

EGL 264 Drama in English

The study of the development of plot, structure, character, setting, theme and language of drama in English.

Fall or spring, 3 credits

J. Harvey

EGL 266 Fiction in English

The study of the development of plot, structure, character, theme and language

of fiction in English.

Fall and spring, 3 credits

P. Dolan, E. Fiess

EGL 268 Prose in English

The study of the various forms of prose such as the essay, utopias, memoirs, autobiography, biography and non-fictional narrative.

3 credits

E. Fiess

EGL 269 Advanced Creative Writing

A writing workshop. Students will receive detailed criticism of their work. This course may be repeated with permission of the Director of Undergraduate Studies in English.

Prerequisites: EGL 105 or EGL 106 and permission of instructor.

Fall and spring, 3 credits

EGL 270 Literary Criticism

Analytic survey of major texts in European and American literary theory and criticism.

Spring, 3 credits

B. Bashford

EGL 272 Literature in English in Its Relations to Other Literatures

The study of literature in English as it

affects and is affected by other literatures.

Fall and spring, 3 credits

EGL 274 Literature in English in Its Relations to Other Disciplines

The study of literature in English as it affects and is affected by other disciplines, such as anthropology, science, sociology, the history of ideas, theology and psychology.

3 credits

EGL 276 Women and Literature

An examination of works written by or about women, which studies the development and conception of women in drama, poetry and fiction.

Fall and spring, 3 credits

S. Sears

VI. Language and Linguistics*

EGL 281 The English Language

The development of the English language from its Indo-European origins with emphasis upon English phonology, morphology, syntax and lexicography, as well as a study of traditional, structural and transformational approaches to the language.

Fall and spring, 3 credits

S. Spector

VII. Special Studies in English

EGL 290 Methods of Instruction in Literature and Composition

Consideration of specific problems in the teaching of English: e.g., posing questions about literary texts and commenting on student papers. Frequent use is made of writing by secondary school

students. Examination of the goals of instruction in literature and language. *Recommended for students seeking certification in secondary school English.*

Fall and spring, 3 credits

B. Bashford, N. Wallis, T. Rogers

EGL 293, 294 Senior English Tutorial

The tutorial is devoted to close supervision of student work in genre, period or author. Instruction is conducted in small groups or on an individual conference basis with the tutor, who directs the student in written practical criticism of literature. Topics for each tutorial are announced before registration. The student's work in the tutorial is recorded on the following basis: H (Honors), S (Satisfactory), U (Unsatisfactory).

Prerequisite: Senior standing.

Fall (EGL 293) and spring (EGL 294), 3 credits each semester

EGL 299 Independent Project

Intensive study of a special topic undertaken with close faculty supervision. Permission of instructor and director of undergraduate studies required. May be repeated.

Prerequisite: permission of department.

Fall and spring, 1 to 3 credits

EGL 300 English Seminar

Advanced work in periods, genres, and authors of English and American literature will be offered in small classes. One or more seminars will be given each semester. The subject matter and its treatment as well as specific prerequisites for each section will be published in the Department's brochure of course descriptions before advance registration in the previous semester.

Prerequisite: Permission of instructor.

Fall and spring, 3 credits

*For additional offerings in linguistics, see the section of this *Bulletin*, "Interdisciplinary Program in Linguistics."

Environmental Studies

Director: Andrew Collver

Assistant Professors: C. Ronald Carroll (*Visiting*), John A. Frizzola (*Adjunct*), Ellis Koch (*Adjunct*), Anthony S. Taormina (*Adjunct*)

Lecturers: Caroline Moore Tripp, John A. Black

Advisory Faculty: Biology—*Robert E. Smolker*, Chemistry—*Theodore D. Goldfarb*, Engineering—*Stewart Harris*, Psychology—*Leonard Krasner*

The Environmental Studies Program (ENS) is based on the idea that we must learn to use natural resources, design buildings and cities and introduce new technologies with greater concern for and sensitivity to impacts on the environment and on the quality of human life. In the program, problems of man-environment relations are explored from the perspectives of the humanities, social sciences and natural sciences. The major in Environmental Studies can serve as preparation for a wide variety of careers, fields of graduate study or avocations. As a liberal studies approach to a subject that is of vital importance to every citizen, the program leads to the B.A. degree.

Requirements for the Major

While fulfilling the general University requirements for the Bachelor of Arts Degree, a student majoring in Environmental Studies must complete the following courses.

	<i>Credits</i>
I. <i>Basic Concepts and Skills</i>	
A. <i>Social Sciences</i> . Two introductory courses chosen from ANT 102, ECO 101, POL 140, PSY 101, and SOC 103, and one research methods course from among ECO 223, POL 200 and SOC 201.	9
B. <i>Natural Sciences</i> . Three introductory courses in two different disciplines, chosen from BIO 109, 110, CHE 101 (or CHE 123, 24), CHE 102, ESS 102, 103, 104, PHY 101, 102 or PHY 103, 104 or PHY 131, 132. A laboratory course (e.g. CHE 105, 106 or ESS 112) must be taken unless a lab is included in one of the introductory courses taken.	10
C. <i>Mathematics</i> . Two courses in mathematics, applied mathematics, computer science or statistics. MSM 101, 111, 112 and MSC 100 are not acceptable.	6

II. Core Courses

15

- ENS 201 Man and the Environment
- ENS 222 Environmental Pollution and its Control
- ENS 291 Environmental Policy Analysis
- ENS 391 Senior Projects Seminar

III. Specialty Requirement

18

Six courses in an approved field of pre-professional study. For requirements for each specialty, see the program director. Suggested concentrations include urban planning, environmental design, technology assessment, environmental education, environmental health, natural resources management, and environmental policy. Other specialties may be developed in response to student demand and faculty availability.

Courses*

ENS 201 Man and the Environment

Analysis of environmental problems generated by technological change, population growth and urbanization. Examination of proposed policies for achieving a balance between man and the environment. Exercises in environmental problem solving. ENS 201 may not be counted toward the general University requirement in natural science or social science.

Fall, 3 credits

ENS 222 Environmental Pollution and its Control

Sources of environmental pollutants, including airborne, liquid and solid wastes, noise, heat and radioactivity. Effects of pollutants on health, property and the global and local environment. Examination of the technology available for pollution control.

Prerequisites: ENS 201 and at least sophomore standing.

Spring, 3 credits

S. Harris

ENS 291 Environmental Policy Analysis

The environmental impact study as a policy tool. Evaluation of existing regu-

latory institutions. Processes of institutional change for environmental protection. Planning for senior projects. Prerequisites: ENS 201 and upper division standing.

Spring, 3 credits

A. Collver

ENS 299 Environmental Research

Individual or group study, with a faculty advisor, of a problem in environmental planning or policy that cuts across the boundaries of subject matter offered by existing departments of the University or that requires interdisciplinary teamwork. May be repeated up to a total of nine credits. May not be taken concurrently with ENS 391.

Prerequisite: Permission of program chairman.

Fall and spring, 1-6 credits

ENS 391 Senior Projects Seminar

Interdisciplinary team projects devoted to analysis of environmental problems and study of policy alternatives. Includes field observations and work with local people concerned with the problems.

Prerequisite: ENS 291.

Fall, 6 credits

*See p. 75, Information About Course Credit.

Foreign Languages Secondary Teacher Provisional New York State Certification Program

Program Advisor: Joseph Tursi—French and Italian

Requirements

In addition to fulfillment of the requirements for the major in French, German, Italian, Russian or Spanish, prospective student teachers of foreign languages are required to take the following courses in order to satisfy all requirements for State certification:

	<i>Credits</i>
Two courses in pre-professional education	6
FLA 239 Methods and Materials in Foreign Language Teaching	3
FLA 350 Supervised Student Teaching	12
FLA 354 Student Teaching Seminar	3
	—
<i>Total</i>	24

Prospective student teachers are also urged to take as many advanced language courses as possible through the semester prior to student teaching. For further information, students are asked to consult with departmental advisors. All questions concerning application for student teaching and requirements for certification are to be directed to Professor Tursi.

Courses*

FLA 239 Methods and Materials in the Teaching of Foreign Languages

A review of methods and materials for the teaching of foreign languages and literatures in the secondary schools including a survey of audiolingual techniques and other recent developments. Special attention will be given to the problems and purposes of the teaching of foreign languages at the high school level.

Prerequisite: Upper division standing.

Fall and spring, 3 credits

B. Elling, J. Tursi

FLA 350 Supervised Teaching—Languages

Prospective foreign-language teachers at

the secondary level receive extensive practice under selected cooperating teachers. Student teachers work with one or two certified foreign-language teachers in one school each regular school day for the entire semester. Frequent consultations with the University faculty members are designed to assist the student. Applications must be filed with the Teacher Training Office of the Department of French and Italian two months prior to student teaching. Not for major credit.

Prerequisite: FLA 239.

Corequisite: FLA 354.

Fall and spring, 12 credits

*See p. 75, Information About Course Credit.

FLA 354 Student Teaching Seminar

Seminar on problems encountered by student teachers and public school teachers at the secondary level in foreign language teaching. Study and analysis of the many aspects of the foreign-language teaching profession, such as individual-

ized teaching, audio-lingual training, use of audio-visuals, testing, professional organizations.

Prerequisite: FLA 239.

Corequisite: FLA 350.

Fall and spring, 3 credits

Department of French and Italian

Professors: Konrad Bieber, Frederick Brown, Oscar A. Haac, G. Norman Laidlaw, Joseph A. Tursi (*Associate Chairman*), Mark S. Whitney, Eléonore M. Zimmermann (*Chairman*)

Associate Professors: Harriet R. Allentuch, Carol Blum, Leonard R. Mills, D. Sandy Petrey, Anthony Rizzuto

Assistant Professors: Mario Mignone, Elizabeth Riggs

Instructors: Anthony Sciabà, Vittoria G. Vetrugno

Lecturers: Jeanine M. Goldman, Michele Lane

At present the department offers major programs leading to the Bachelor of Arts degree in French and Italian, as well as a variety of courses of interest to non-majors. Students wishing to major in French or Italian should examine the requirements below and consult the appropriate departmental advisors for help in choosing individual programs.

Language majors and other interested students who would like to spend a semester or a year studying abroad should consult departmental advisors.

Placement

Entering students who wish to continue study of French or Italian started in high school should register for the appropriate college course, consulting a departmental advisor in doubtful cases. Note that no graduation credit is credit for the first course (111) in the same language, after two years of high school preparation, and no credit for the first two courses (111, 112 or 115), if the student has had three years of high school preparation.

Requirements for the Major in French

In addition to the general University requirements for the Bachelor of Arts degree, the following courses are required for the major in French:

I. Required courses for a minimum total of 15 credits:	<i>Credits</i>
A. <i>Language courses</i>	
FRN 222 Introduction to Stylistics	3
FRN 321 Phonetics and Diction	3
FRN 322 Stylistics	3
B. <i>Literature courses</i>	
FRN 296, 296 Readings in French Literature: Analysis and Interpretation	6
II. Elective courses:	
Twenty-one additional credits of work in courses beyond FRN 295, 296, chosen in consultation with the departmental advisor. It is strongly recommended that the student select a diversified program	21
	<hr/>
<i>Total</i>	36

Requirements for the Major in Italian

In addition to the general University requirements for the Bachelor of Arts degree, the following courses are required for the major in Italian:

I. Required courses for a minimum total of 12 credits:	<i>Credits</i>
A. <i>Language courses</i>	
ITL 222 Conversation and Composition II	3
ITL 321 Advanced Conversation and Composition I	3
B. <i>Literature courses</i>	
ITL 295, 296 Introduction to Italian Literature I, II	6
II. Elective courses:	
Twenty-one additional credits of work in courses which must be at the 300 level and should be chosen in consultation with the departmental advisor. It is strongly recommended that the student select a diversified program.	21
	<hr/>
<i>Total</i>	33

Teacher Training Program

Students who wish to prepare for certification as secondary school teachers of French and/or Italian, should consult appropriate departmental advisors concerning requirements and procedures for the teacher preparation program. All students will be required to take FLA 239 as one of the four courses in education required by the State Education Department. Students of Italian will be urged to take, in

addition to the courses required for certification, ITL 322 and ITL 240, if appropriate. See also alphabetical listing, Foreign Languages Secondary Teacher Provisional New York State Certification Program.

Courses*

French Literature in Translation

FRN 108, 109 French Literature: The Contemporary Scene

Readings in French literature in translation from the modern period, chosen from such authors as Proust, Gide, Mauriac, Malraux, St. Exupéry, Anouilh, Cocteau, Sartre, Camus, Beckett, Genet, Robbe-Grillet, Ionesco, Butor. Each course may be taken independently of the other. Small discussion groups meet informally.

Fall and spring, 3 credits each semester
E. Riggs

FRN 110 French Literature: The Great Works

Readings in French literature in translation from the Renaissance to the beginning of the 20th century from such authors as Rabelais, Montaigne, Molière, Racine, Voltaire, Diderot, Rousseau, Laclos, Balzac, Flaubert, Zola.

Fall, 3 credits
E. Riggs

FRN 292 Special Author in Translation

A course given in translation in the de-

velopment of a French major literary current, taught by specialists in the field and designed primarily to give juniors and seniors in other disciplines an opportunity to become acquainted with the French tradition. Majors will be admitted with special permission of their advisor, and will do the reading and term papers in the original language.

Prerequisite: EGL 191, 192, or 193 or equivalent.

Fall, 3 credits

FRN 291 Genre Study in Translation

A course in a major French author in translation taught by specialists in the field and designed primarily to give juniors and seniors in other disciplines an opportunity to become acquainted with the French tradition. Majors will be admitted with special permission of their advisor, and will do the reading and term papers in the original language.

Prerequisite: EGL 191, 192, or 193 or equivalent.

Spring, 3 credits

Courses in French

FRN 111, 112 Elementary French I, II

An introduction to spoken and written French, stressing pronunciation, speaking, comprehension, reading and writing. Language laboratory will supplement class work.

Fall and spring, 3 credits each semester

FRN 115 Elementary French (An Intensive Course)

An introduction to spoken and written French, stressing pronunciation, speaking, comprehension, reading and writing. Language laboratory will supplement class work.

Fall and spring, 6 credits

*See p. 75, Information About Course Credit.

FRN 116 Reading French

An intensive introductory course designed to teach the student to read and understand prose texts of moderate difficulty in French. Texts will be chosen to prepare students to handle French writings in their own fields. Instruction in basic grammar; practice in translation from French to English. The course does not carry credit towards the major and may not be taken for credit after FRN 191, 192 or 195.

Fall and spring, 3 credits each semester

G. N. Laidlaw

FRN 191, 192 Intermediate French

An intermediate course in conversation, composition and the interpretation of French texts.

Prerequisite: FRN 112 or equivalent.

Fall and spring, 3 credits each semester

**FRN 195 Intermediate French
(An Intensive Course)**

Review of grammar and discussion of simple French texts through reading, writing and discussion. Language laboratory will supplement class work.

Prerequisite: FRN 115 or equivalent.

Fall and spring, 6 credits

**FRN 197 Intermediate French
Conversation**

This course may be taken separately or to supplement FRN 192 or FRN 195.

Prerequisite: FRN 115 or equivalent.

Fall and spring, 2 credits

G. N. Laidlaw

**FRN 221 Conversation and
Composition**

A course in the active use of spoken and written French. Language laboratory will supplement class work.

Prerequisite: FRN 192 or 195 or equivalent.

Fall and spring, 3 credits

J. Goldman, Staff

FRN 222 Introduction to Stylistics

Reading of selected short passages of prose and poetry in class with emphasis on improved writing skills, oral expression, and increased mastery of French syntax and techniques of literary analysis.

Prerequisite: FRN 192 or 195 or equivalent.

Spring, 3 credits

M. S. Whitney

FRN 234 Practical French

A course designed for students who wish to become more proficient in reading, writing, and translating French. Students will also be trained in the use of French in business, in administration, and in everyday professional life. Emphasis will be placed on the idiomatic peculiarities of the French language and the relation of French to the structure of English.

Prerequisite: FRN 222.

Fall and spring, 3 credits

N. Becker

FRN 291 Genre Study in Translation

(See French Literature in Translation section for description.)

FRN 292 Special Author in Translation

(See French Literature in Translation section for description.)

**FRN 295, 296 Readings in French
Literature: Analysis and
Interpretation**

These courses will teach literary analysis and its applications to representative texts chosen from various periods of French literature. All readings will be done in French. Discussions will be in French, although one section designed for non-majors will be conducted in English.

Prerequisite: FRN 192 or 195 or equivalent.

Fall and spring, 3 credits each semester

D. S. Petrey

FRN 297 The French Novel

A study of the nature and development of the novel from its beginnings to the present with special attention paid to the stylistic and thematic interrelationships that constitute the organic unity of works as diverse as Rabelais' *Gargantua* and Mme de Lafayette's *La Princesse de Clèves*.

Prerequisite: FRN 192 or 195 or equivalent.

Fall, 3 credits

M. S. Whitney

FRN 298 The French Comedy from Molière to Ionesco

The study of the comic tradition from Molière to the contemporary theatre.

Prerequisite: FRN 192 or 195 or equivalent.

Fall, 3 credits

FRN 299 Studies in French Criticism

Introduction to French literary criticism from 1549 to the present with special emphasis placed upon modern critical approaches to the interpretation of literature (formalistic, structural, psychological, sociological, comparative).

Prerequisite: FRN 192 or 195 or equivalent.

Spring, 3 credits

FRN 300 French Poetry

A study of the development of French poetry from the Pléiade to the 20th century. Poems will be analyzed and dis-

cussed from an historical and aesthetic point of view.

Prerequisite: FRN 192 or 195 or equivalent.

Fall, 3 credits

E. Zimmermann

FRN 321 Phonetics and Diction

A course designed to develop mastery of the spoken language. Students will learn to express themselves in the current idiom with fluency and accuracy. At least two hours of laboratory weekly will be required.

Prerequisite: FRN 221 or 295 or 296.

Fall, 3 credits

J. Goldman

FRN 322 Stylistics

A course designed to acquaint students with the subtleties of French grammar and style. Extensive practice in composition and in translation from English to French.

Prerequisite: FRN 221 or 295 or 296.

Spring, 3 credits

M. Lane

FRN 323 Advanced French Conversation

A course designed to develop and maintain complete fluency in the language.

Prerequisite: FRN 221 or 295 or 296.

Fall, 3 credits

J. Goldman

Further Studies in French Literature

The specific content of courses FRN 333; 343; 344; 351, 352; 361, 362; 373, 374; 393, 394 will be announced annually and printed in the schedule of classes each semester. These courses may be repeated for credit with permission of the department as the subject matter differs. FRN 222, FRN 295, 296 are prerequisite for the following courses.

FRN 333 Studies in 16th Century Literature

Fall, 3 credits

M. S. Whitney

FRN 343 French Classical Theatre

Reading of selected works by Corneille, Racine and Molière.

Fall, 3 credits

H. Allentuch, E. Zimmermann

FRN 344 Studies in 17th Century Literature

Reading of texts from such authors as Pascal, La Rochefoucauld, La Bruyère, Madame de Sévigné, Madame de Lafayette, Saint-Simon, La Fontaine.

Spring, 3 credits

H. Allentuch

FRN 351, 352 Studies in 18th Century Literature

Fall and spring, 3 credits each semester

C. Blum, O. Haac

FRN 361, 362 Studies in 19th Century Literature

Fall and spring, 3 credits each semester

D. S. Petrey, A. Rizzuto

FRN 373, 374 Studies in 20th Century Literature

Fall and spring, 3 credits each semester

F. Brown, K. Bieber

FRN 382 Literature of Commitment

Literature of commitment and the reaction against commitment in the 20th century.

Fall, 3 credits

K. Bieber

FRN 390 French Civilization

A discussion of French civilization from

the creation of the modern state to the present. The course is intended for those interested in studying the background and traditions of modern France. An anthology of historical texts and documents will serve as a point of departure; the institutions and life in France will be considered, along with the development of art, architecture, music, and literature. The emphasis will be on discussion (in French) and individual projects. Visiting lecturers will contribute to the variety of topics and points of view.

Prerequisites: FRN 295, 296.

Fall, 3 credits

O. Haac, K. Bieber

FRN 393, 394 Free Seminar

Free seminars are frequently built around a theme like "Women in French Literature," "Self-Deception in the 17th Century *Moralistes* and the 20th Century Novel," "The City in the French Novel." A detailed description of the seminar may be obtained from the department.

Prerequisites: Permission of department.

Fall and spring, 3 credits each semester

FRN 399 Directed Readings in French

Individually supervised readings in selected topics of French language and literature. May be repeated.

Prerequisite: Permission of department.

Fall and spring, 1 to 6 credits

Italian Literature in Translation

ITL 108 Dante and His Times

An introduction to Dante's thought. Reading and discussion of the *Divine Comedy* in translation in the light of the social, political, and cultural realities of 13th century Italy. A knowledge of Italian is not required.

Fall and spring, 3 credits

V. Vetrugno

ITL 291 Genre Study in Translation

A course given in translation in the development of an Italian major literary current, taught by specialists in the field and designed primarily to give juniors and seniors in other disciplines an opportunity to become acquainted with the Italian tradition. Majors will be admitted with special permission of their advisor, and will do the reading and term papers in

the original language.

Prerequisite: EGL 191, 192, or 193 or equivalent.

Fall, 3 credits

ITL 292 Special Author in Translation

A course in a major Italian author in translation taught by specialists in the

field and designed primarily to give juniors and seniors in other disciplines an opportunity to become acquainted with the Italian tradition. Majors will be admitted with special permission of their advisor, and will do the reading and term papers in the original language.

Prerequisite: EGL 191, 192, or 193 or equivalent.

Spring, 3 credits

*Courses in Italian**

ITL 111, 112 Elementary Italian

An introduction to spoken and written Italian, stressing pronunciation, speaking, comprehension, reading and writing. Selected texts will be read. Practice in language laboratory supplements class work.

Fall and spring, 3 credits each semester

ITL 115 Intensive Elementary Italian

An intensive course covering the elementary Italian program (ITL 111, 112) in one semester.

Fall and spring, 6 credits

M. Mignone

ITL 116 Reading Italian

An intensive introductory course designed to teach the student to read and understand prose texts of moderate difficulty in Italian. Texts will be chosen to prepare students to handle Italian writings in their own fields. Instruction in basic grammar; practice in translation from Italian to English. The course does not carry credit towards the major and may not be taken for credit after Italian 191, 192 or 195.

Fall and spring, 3 credits

L. Mills and Staff

ITL 191, 192 Intermediate Italian

An intermediate course in the reading and discussion of selected Italian texts. An intensive grammar review which will offer an opportunity to develop conver-

sational ability.

Prerequisite: ITL 112 or 115 or equivalent.

Fall and spring, 3 credits each semester

L. Mills

ITL 195 Intensive Intermediate Italian

An intensive course covering the intermediate Italian program (ITL 191, 192) in one semester.

Prerequisite: ITL 112 or 115 or equivalent.

Fall and spring, 6 credits

M. Mignone

ITL 221 Italian Conversation and Composition I

A course in spoken and written Italian, with emphasis on precision and fluency in the spoken form.

Prerequisite: ITL 192 or 195 or equivalent.

Fall and spring, 3 credits

M. Mignone

ITL 222 Italian Conversation and Composition II

A course in spoken and written Italian, with emphasis on precision in written form.

Prerequisite: ITL 192 or 195, or equivalent.

Fall and spring, 3 credits

*See p. 75, Information About Course Credit.

ITL 234 Practical Italian

A course designed for students who wish to become more proficient in reading, writing, and translating Italian. Students will also be trained in the use of Italian in business, in administration, and in everyday professional life. Emphasis will be placed on the idiomatic peculiarities of the Italian language and the relation of Italian to the structure of English.

Prerequisite: ITL 222.

Fall and spring, 3 credits

C. Franco

ITL 240 Curriculum Development

The course is designed to train future language teachers of Italian in the development of well-articulated language programs from FLES through secondary schools. Through mini- and micro-teaching, students will have the opportunity to enjoy clinical experience in the actual classroom each week for a period of at least two hours. Each student will be assigned to a cooperating teacher in a nearby secondary school.

Prerequisites: FLA 239, ITL 222.

Spring, 3 credits

J. Tursi

ITL 291 Genre Study in Translation

(See Italian Literature in Translation section for description.)

ITL 292 Special Author in Translation

(See Italian Literature in Translation section for description.)

ITL 295 Introduction to Italian Literature I

Readings and discussions of representative writers in Italian literature of the 19th and 20th centuries. This course is designed to introduce the students to the main currents of Italian literature through analysis of literary texts.

Prerequisite: ITL 192 or 195.

Fall, 3 credits

ITL 296 Introduction to Italian Literature II

Readings and discussions of representative texts chosen from various periods of Italian literature from the 13th through the 18th centuries.

Prerequisite: ITL 192 or 195.

Spring, 3 credits

A. Sciaba

ITL 321 Advanced Conversation and Composition I

This course intends to develop fluency and accuracy in the use of the spoken language through intensive practice, exposition, class discussion and the use of the language laboratory.

Prerequisite: ITL 222.

Fall, 3 credits

J. Tursi

ITL 322 Advanced Conversation and Composition II

A course designed to acquaint students with the subtleties of Italian grammar and style. Extensive practice in composition and in translation from English to Italian.

Prerequisite: ITL 221 or 222 or equivalent.

Spring, 3 credits

J. Tursi

ITL 324 History of the Italian Language

A survey of the development of the Italian language from its origin to the present day.

Prerequisite: ITL 222 or 295 or 296.

Spring, 3 credits

L. Mills

ITL 390 The Italian Scene

The reality of Italy and the Italian people through a study of the evolution of the historical, cultural, political and social character of the nation. This course will be taught in Italian.

Prerequisite: ITL 192 or 195 or equivalent.

Fall, 3 credits

M. Mignone

ITL 399 Directed Readings in Italian

Individually supervised readings in selected topics of Italian language and

literature. May be repeated.

Prerequisite: Permission of department.
Fall and spring, 1 to 6 credits

Further Studies in Italian Literature

The specific content of courses ITL 305, 306; 331, 332; 340; 350; 371, 372 will be announced annually and printed in the schedule of classes as a sub-title each semester. These courses may be repeated for credit with permission of the department as the subject matter differs. ITL 222, 297, 298 are prerequisite for these courses.

ITL 305, 306 Studies in 13th and 14th Century Literature

Fall and spring, 3 credits

V. Vetrugno

ITL 350 Studies in 19th Century Literature

Spring, 3 credits

V. Vetrugno

ITL 331, 332 Studies in 15th and 16th Century Literature

Fall, 3 credits

ITL 371, 372 Studies in Contemporary Literature

Fall and spring, 3 credits

M. Mignone

ITL 340 Studies in 18th Century Literature

Fall, 3 credits

J. Tursi

Department of Germanic and Slavic Languages and Literatures

Professors: Edward J. Czerwinski, Roman Karst, Klaus Schröter, Leif Sjöberg

Associate Professors: Samuel Berr, Russell E. Brown, Barbara Elling, Ferdinand A. Ruplin, John R. Russell (*Chairman*), Lucy E. Vogel

Assistant Professors: Daniel C. O'Neil, Philippe D. Radley

Lecturers: Ursula Meyer (*Adjunct*), Frank Schnur, Joel Beritz

Requirements for the Major in German

In addition to the general university requirements for the Bachelor of Arts degree, the major in German must complete the following se-

quence for a total of thirty credits.

- GER 199 German Civilization and Culture
- GER 202 History of the German Language
- GER 203 Introduction to Germanic Studies
- GER 204 Survey of German Literature
- GER 205 German Drama
- GER 206 German Prose
- GER 207 German Poetry
- GER 208 Goethezeit
- GER 221, 222 German Conversation and Composition

Note: The ascending numbers of the required options for the major are simply intended to suggest the sequence in which they might be studied most favorably; German 199-204 are to be regarded as pre- or corequisites to the courses beyond 204. The student may request permission to substitute courses from GER 301-303 for those in the GER 205-208 sequence.

Note: Students majoring in German may consider spending their junior or senior year at the University of Tübingen, Germany, with the permission of the department.

Requirements for the Major in Russian

In addition to the general University requirements for the Bachelor of Arts degree, the major in Russian must complete the following sequence for a total of thirty-nine credits.

- RUS 141, 142 Masterpieces of Russian Literature
- RUS 221, 222 Russian Conversation and Composition
- RUS 239 Linguistics for the Teacher of Russian or
RUS 302 History of the Russian Language
- RUS 291 or 292 Topics Courses in Translation
- RUS 293 Aspects of Contemporary Slavic Culture
- RUS 321, 322 Advanced Conversation and Composition
- RUS 391, 392, 393 Advanced Topics Courses
- HIS 242 Imperial Russia

Note: The department strongly recommends that majors take related courses in other departments. A list of recommended courses is available from departmental advisors.

Students may also wish to complete some of their work abroad. SUNY maintains exchange programs with Russia and Poland for which qualified students may apply.

Teacher Certification

Students who wish to prepare for certification as secondary school teachers of German or Russian should consult appropriate departmental advisors. Those seeking certification in German are urged to take, in addition to the courses required for certification, GER 237,

GER 240 and GER 321, 322. Students of Russian are urged to take RUS 239 and RUS 302.

See also alphabetical listing: Foreign Languages Secondary Teacher Provisional New York State Certification Program.

Placement in Language Courses for Incoming Freshmen

Students continuing the study of a foreign language started in high school should register for the appropriate college course after consulting a departmental advisor; however, after two years of high school preparation, they will receive no graduation credit for the first course (111) in the same language and after three years of high school preparation they will receive no credit for the first two courses (111, 112) in the same language.

Courses*

Germanic Languages and Literatures

GER 111, 112 Elementary German I, II

An introduction to spoken and written German, stressing pronunciation, speaking, comprehension, reading, writing and culture. The course consists of three hours in a small section conducted in German, one hour in a group (plenary) section taught by a contrastive linguist and one lab hour.

Fall and spring, 4 credits each semester
F. Ruplin and Staff

GER 113 Intensive Elementary German

An intensive course covering the elementary German program (GER 111, 112) in one semester.

Fall and spring, 6 credits
J. Russell and Staff

GER 115, 116 Reading German

An introductory course designed to teach the student to read and translate German prose of moderate difficulty. Practice in translating from German into English and in transferring ideas into the appropriate terminology. This course is not intended to prepare the student for the major. May not be taken for credit

after GER 191, 192.

Fall and spring, 3 credits each semester
D. O'Neil

GER 191, 192 Intermediate German I, II

(Formerly GER 151, 152)

The reading and interpretation of a wide variety of German texts, with a review of German grammar, composition and conversation. Work in the language laboratory will further develop audiolingual skills.

Prerequisite: GER 112 or equivalent.

Fall and spring, 3 credits each semester
D. O'Neil and Staff

GER 195 Intensive Intermediate German

An intensive course covering the intermediate German program (GER 191, 192) in one semester.

Prerequisite: GER 112 or 113 or equivalent.

Fall and spring, 6 credits
J. Russell and Staff

*See p. 75, Information About Course Credit.

GER 199 German Civilization and Culture

An introduction to the history, culture and literature of the German speaking areas. The course, offered in English, is team taught by members of the department and guest speakers.

Fall, 3 credits

B. Elling and Staff

GER 202 History of the German Language

The development of the German language from Indo-European to modern High German. While special emphasis will be placed on western Germanic languages, specifically German, some attention will be given to the Scandinavian languages and Gothic. The framework within which work will be done will be that of modern linguistic theory (generative-transformational phonology). A historically representative selection of texts will be examined. Taught by tutorial method and/or seminar.

Prerequisite: GER 192 or 195.

Spring, 3 credits

GER 203 Introduction to Germanic Studies

Using selected short texts easily read and understood by students whose background in German may be limited, this course is intended to introduce students to techniques of literary analysis and interpretation.

Prerequisite: GER 192 or 195.

Fall, 3 credits

K. Schröter

GER 204 Survey of German Literature

A chronological survey of German literature from its beginnings to the present with stress on defining the periods therein. All readings will be in German. Prerequisite: GER 192 or 195 or equivalent.

Spring, 3 credits

B. Elling

GER 205 German Drama

A survey of German drama and its sub-

genres. All work will be done in German.

Prerequisite: GER 204.

Fall, 3 credits

R. Brown

GER 206 German Prose

A survey of German prose and its sub-genres. All work will be done in German.

Prerequisite: GER 204.

Spring, 3 credits

K. Schröter

GER 207 German Poetry

A survey of German poetry and its sub-genres. All work will be done in German.

Prerequisite: GER 204.

Fall, 3 credits

R. Karst

GER 208 Goethezeit

An intensive study of German literature in the period 1750-1832. All work will be done in German.

Prerequisite: GER 204.

Spring, 3 credits

R. Karst

GER 221, 222 German Conversation and Composition

(Formerly GER 197, 198)

This course consists of the active use of spoken and written German.

Prerequisite: GER 192 or 195.

Fall and spring, 3 credits each semester

GER 237 Contrastive Structures of German and English

A detailed descriptive analysis of modern German phonology, morphology and syntax from the standpoint of transfer interference.

Prerequisite: GER 221, 222 or fluency in German.

Fall, 3 credits

F. Ruplin

**GER 240 Curriculum Development:
German**

The course is designed to train language teachers in the development of clearly defined and articulated German language programs which will satisfy not only their own standards but also those of state and local educational systems. Course work will include frequent visits to cooperating public schools.

Prerequisite: FLA 239.

Spring, 3 credits

B. Elling

GER 301 Special Author

A tutorial demanding intensive study of the works of a specific German-language author. All work will be done in German. Prerequisite: Permission of instructor.

Fall and spring, 3 credits each semester

GER 302 Special Period

A tutorial demanding intensive study of

German-language literature of a specific period. All work will be done in German.

Prerequisite: Permission of instructor.

Fall and spring, 3 credits each semester

GER 303 Special Sub-Genre

A tutorial demanding intensive study of a specific literary sub-genre within German-language literature. All work will be done in German.

Prerequisite: Permission of instructor.

Fall and spring, 3 credits each semester

**GER 321, 322 Advanced German
Conversation and Composition**

(Formerly GER 209, 210)

A course designed to develop mastery of spoken German. Students will learn to express themselves idiomatically and fluently and become acquainted with the subtleties of German grammar and style.

Prerequisites: GER 221, 222.

Fall and spring, 3 credits each semester

Selected Germanic Languages

**SGL 111, 112 Selected Germanic
Languages (Elementary) I, II**

An introduction to a selected Germanic language (Danish, Icelandic, Norwegian, etc.), speaking, comprehension, reading

and writing. Selected texts will be read. Practice in the language lab supplements class work.

Fall and spring, 3 credits each semester

Scandinavian

SWE 11, 112 Elementary Swedish I, II

An introduction to spoken and written Swedish, stressing pronunciation, speaking, comprehension, reading and writing. Selected texts will be read. Practice in the language lab supplements class work.

Fall and spring, 3 credits each semester
Staff

Prerequisite: SWE 112 or equivalent.

Fall and spring, 3 credits each semester
L. Sjöberg

**SWE 191, 192 Intermediate
Swedish I, II**

(Formerly SWE 151, 152)

The reading and interpretation of Swedish texts, with a review of Swedish grammar, composition and conversation.

**SWE 299 Directed Readings in
Scandinavian**

Individually supervised readings of selected Scandinavian authors such as Ibsen, Strindberg, Lagerkvist, Moberg and Holberg. May be repeated.

Prerequisites: Reading fluency in the language of the author studied and permission of department.

Fall and spring, 3 credits
L. Sjöberg

Yiddish

YDH 111, 112 Elementary Yiddish

An introduction to spoken and written Yiddish, stressing pronunciation, speaking, comprehension, reading, writing and culture.

Fall and spring, 3 credits each semester
S. Berr

YDH 191, 192 Intermediate Yiddish

(Formerly YDH 151, 152)

The reading and interpretation of Yiddish texts, with a review of Yiddish grammar, composition and conversation.

Prerequisite: YDH 112.

Fall and spring, 3 credits each semester
S. Berr and Staff

YDH 205 Yiddish Drama

Intensive study of Yiddish drama. All work will be done in Yiddish.

Prerequisite: YDH 192.

Fall, 3 credits

S. Berr

YDH 206 Yiddish Novel

Intensive study of the Yiddish novel. All work will be done in Yiddish.

Prerequisite: YDH 192.

S. Berr

Slavic Languages and Literatures—Polish

PSH 111, 112 Elementary Polish I, II

An introduction to spoken and written Polish, stressing pronunciation, speaking, comprehension, reading, writing and culture.

Fall and spring, 3 credits each semester

PSH 191, 192 Intermediate Polish I, II

The reading and interpretation of Polish

texts, with a review of Polish grammar, composition and conversation. The student gains an acquaintance with the various literary genres through examples drawn from representative Polish authors.

Prerequisite PSH 112 or equivalent.

Fall and spring, 3 credits each semester

Minor East European Languages

EEL 111, 112 Elementary Minor East European Language I, II

An introduction to a spoken and written minor East European Language (Serbo-Croatian, Czech, Ukrainian, Slovak, Macedonian, Slovenian, Bulgarian and/or Hungarian), stressing pronunciation, speaking, comprehension, reading, writing and culture. (This course may be repeated for more than one language.)

Fall and spring, 3 credits each semester
B. Stroke and Staff

EEL 191, 192 Intermediate Minor East European Language I, II

The reading and interpretation of a minor East European language's texts, with a review of grammar, composition and conversation. The student gains an acquaintance with the various literary genres through examples drawn from representative authors. (This course may be repeated for more than one language.)

Prerequisite: EEL 111, 112 or equivalent.

Fall and spring, 3 credits each semester

Russian

RUS 111, 112 Elementary Russian I, II

An introduction to Russian. Class work will be supplemented by practice in the language laboratory.

Fall and spring, 3 credits each semester

P. Radley and Staff

RUS 115, 116 Reading Russian I, II

This course is designed to teach the student to read and translate Russian expository prose of moderate difficulty. It includes practice in translating ideas into the appropriate technical terminology. This course is intended to prepare the graduate student for the Ph.D. proficiency requirement, but is also open to undergraduates who do not intend to major in Russian.

Fall and spring, 3 credits each semester

RUS 141, 142 Masterpieces of Russian Literature

A survey of the major works of Russian Literature of the 19th and 20th Centuries such as Tolstoy's *War and Peace*, Dostoevsky's *Brothers Karamazov*, Sologub's *Petty Demon*, Solzhenitsyn's *Gulag Archipelago*. This course is designed to give the student a short history of Russian Literature as well as a certain competence in the analysis of texts.

RUS 191, 192 Intermediate Russian I, II

An intermediate course in Russian stressing an active command of the language. Prerequisite: RUS 112 or equivalent.

Fall and spring, 3 credits each semester

RUS 221, 222 Russian Conversation and Composition

This course consists of the active use of spoken and written Russian.

Prerequisite: RUS 192.

Fall and spring, 3 credits each semester

RUS 239 Linguistics for the Teacher of Russian

Applied linguistics for future teachers of the Russian language; the phonetics and

morphology needed to explain Russian grammar to students.

Prerequisite: RUS 192.

Spring, 3 credits

RUS 280 Translation Workshop

A practical study of the special problems and techniques of literary and technical translation from Russian into English. Emphasis will be on translating current texts and journals.

Prerequisite: RUS 222.

Fall or spring, 3 credits

RUS 291 Special Author in Translation

Each semester will be devoted to one particular author such as Tolstoy, Dostoevsky, Chekhov, etc. Essential works and significant criticism will be analysed. May be repeated, but will count toward fulfillment of major requirements only once.

Prerequisites: RUS 141, 142 or two other literature courses.

Fall and spring, 3 credits

E. Czerwinski, P. Radley

RUS 292 Special Genre or Period in Translation

Each semester will be devoted to one particular genre or period such as the Russian Novel of the 19th Century, Russian Drama, the Golden Age, Symbolism, etc. Essential works and significant criticism will be analyzed. May be repeated, but will count toward fulfillment of major requirements only once.

Prerequisites: RUS 141, 142 or two other literature courses.

Fall and spring, 3 credits

P. Radley

RUS 293 Aspects of Contemporary Slavic Culture

Analysis and discussion of literary and social topics dealing with Russia or East Europe related to contemporary culture and life, such as: Dissidents in the Slavic World, The Jew in Russia, Role of Women in Slavic World. May be repeated, but

will count toward fulfillment of major requirements only once.

Prerequisite: RUS 142 or HIS 243.

Fall and spring, 3 credits

RUS 302 History of the Russian Language

(Formerly RUS 202)

The development of the Russian literary language from its beginnings to the present day. The influence of Church Slavonic on the development of the language will be discussed.

Prerequisite: RUS 191.

Spring, 3 credits

RUS 321, 322 Advanced Russian Conversation and Composition

(Formerly RUS 209, 210)

A course designed to develop mastery of spoken Russian. Students will learn to express themselves idiomatically and fluently and become acquainted with the subtleties of Russian grammar and style.

Prerequisites: RUS 221, 222.

Fall and spring, 3 credits each semester

L. Vogel

RUS 391 Special Author

A detailed study of the works of a major author of the nineteenth or twentieth century, such as Pushkin, Gogol, Turgenyev, Blok, etc. Readings will be in Russian, and classes will be conducted largely in Russian. May be repeated as the subject matter changes.

Prerequisites: RUS 141, 142 and RUS 221.

Fall and spring, 3 credits

RUS 392 Special Genre or Period

A detailed study of a special genre such as the Russian Novel, Russian Drama, or period such as the Baroque, the Golden Age. Readings will be in Russian, and classes will be conducted largely in Russian. May be repeated as the subject matter changes.

Prerequisites: RUS 141, 142 and RUS 221.

Fall and spring, 3 credits

RUS 393 Senior Seminar

Group discussion in Russian and individual research on various aspects of Russian culture and life.

Prerequisites: RUS 141, 142 and RUS 221.

Fall and spring, 3 credits

Department of Hispanic Languages and Literature

Professors: Pedro Lastra, Vicente Llorens, Iris Zavala

Associate Professors: Jaime Giordano, Clara Lida (*Joint*), James McKenna (*Chairman*)

Assistant Professors: Louise Fainberg (*Director of Undergraduate Studies*), Román de la Campa (*Coordinator of Hispanic Bilingual-Bicultural Studies*), William Little

Instructor: Alan Francis

Lecturers: Gabriela Greenfield, John Rotta

The Department offers a major program leading to the Bachelor of Arts degree in Spanish and a variety of courses in Portuguese. Students wishing to major in Spanish should consult with a departmental advisor to choose individual programs.

Requirements for the Major in Spanish

In addition to the general University requirements for the Bachelor of Arts degree, the following courses are required for the major in Spanish:

	<i>Credits</i>
I. Required basic courses:	
A. Either SPN 221, 222 Spanish Conversation and Composition I, II, or SPN 198 Spanish Conversation and Composition for Students of Spanish-speaking background.	3 or 6
B. SPN 291 The Culture and Civilization of Spain, and SPN 292 The Culture and Civilization of Spanish-America.	6
C. SPN 296 Introduction to Spanish-American Literature, SPN 297, 298 Introduction to Spanish Literature, I, II.	9
II. Advanced courses in Hispanic linguistics, literature and culture:	
Fifteen additional credits of work which must be in courses at the 300 level, to be chosen in consultation with the departmental advisor. (Not more than 3 credits of 399 are applicable towards the major.)	15
<i>Total</i>	<hr/> 33 or 36

The department requires that transfer students take at least eighteen credits of Spanish courses in residence at Stony Brook to complete a Spanish major.

Placement

Entering students who wish to continue study of Spanish started in high school should register for the appropriate college course, con-

sulting a departmental advisor or the Director of Undergraduate Studies in doubtful cases. The following are standard procedures:

1. A student with one year of high school Spanish is accepted for credit starting from SPN 111 or SPN 115;

2. A student with two or three years of high school Spanish is not accepted for credit in these courses and must start from SPN 191 or 195; an exception could be granted if there has been an interruption of three or more years between the student's last semester of high school studies and the year when college training in the language starts;

3. A student with four years of high school studies must start from SPN 221 or 222, or from SPN 191 or 195 if there has been an interruption of two or more years.

Challenge examinations are given for SPN 115, 195, 221 and 222 (with SPN 111, 112, and 191, 192 considered equivalent to SPN 115 and SPN 195 respectively).

Teacher Training Program

Students who wish to prepare for certification as secondary school teachers of Spanish should consult appropriate departmental advisors concerning requirements and procedures of the teacher preparation program. See also alphabetical listing: Foreign Languages Secondary Teacher Provisional New York State Certification Program.

Minor in Hispanic Bilingual-Bicultural Studies

Majors in Spanish and students who are majoring in other disciplines (i.e., a major in history who wishes to obtain a license as a bilingual teacher in order to be able to teach history in Spanish), can take this minor. Its requirements are the following:

a) Proficiency in both English and Spanish as demonstrated by passing an examination in English, and an examination in Spanish on the 200 level.

b) Required courses: PRS 102, IAS 121, SPN 381, SPN 382—Total 12 Credits.

c) 12 credits of related courses chosen in consultation with the program coordinator or a designated advisor, among the following list:

PRS 101, 155, 202, 220, 295, 299

IAS 122, 401, 402

ANT 201, 219, 308

ECO 284, 386

HIS 194, 223, 330, 421

SPN 292, 296, 301, 302, 332, 342, 350

LIN 245, LIN 329

EGL 282

Courses*

Portuguese Language

POR 115 Intensive Elementary Portuguese

An intensive course to present the fundamentals of Portuguese grammar and to provide practice in reading, writing, and speaking.

Fall and spring, 6 credits

G. Greenfield

POR 195 Intensive Intermediate Portuguese

An intensive course to develop competence in reading, writing, and speaking Portuguese through the interpretation of

selected literary texts.

Prerequisite: POR 115 or equivalent.

Fall and spring, 6 credits

G. Greenfield

POR 299 Directed Readings in Portuguese

Individually supervised readings in selected topics of Portuguese language and literature.

Prerequisite: Permission of department.

Fall and spring, 1 to 6 credits

G. Greenfield

Spanish Language

SPN 111, 112 Elementary Spanish I, II

An introduction to spoken and written Spanish, stressing pronunciation, speaking, comprehension, reading and writing. Language laboratory will supplement class work.

Fall and spring, 3 credits each semester

W. Little, Staff

SPN 115 Intensive Elementary Spanish

An intensive version of SPN 111, 112.

Fall and spring, 6 credits

W. Little, Staff

SPN 191, 192 Intermediate Spanish I, II

A comprehensive review of the Spanish language. It is intended to develop competence in reading, writing, and speaking Spanish through the interpretation of selected literary texts.

Prerequisite: SPN 112 or SPN 115 or equivalent.

Fall and spring, 3 credits each semester

L. Fainberg, Staff

SPN 195 Intensive Intermediate Spanish

An intensive version of SPN 191, 192.

Prerequisite: SPN 112 or SPN 115 or equivalent.

Fall and spring, 6 credits

L. Fainberg, Staff

SPN 197 Spanish for Students of Spanish-Speaking Background

A study of the fundamentals of Spanish grammar. This course is designed for students of Spanish-speaking background to help them develop their competence in the use of the language.

Fall, 6 credits

R. de la Campa, Staff

SPN 198 Spanish Conversation and Composition for Students of Spanish-Speaking Background

(Formerly SPN 227)

A course intended for students of Spanish-speaking background, designed to improve their competence in oral and written Spanish.

Prerequisite: SPN 197 or equivalent.

Spring, 3 credits

*See p. 75, Information About Course Credit.

SPN 221 Spanish Conversation and Composition I

A course in the active use of Spanish, with emphasis on precision and fluency in the *spoken* form.

Prerequisite: SPN 192 or SPN 195 or equivalent.

Fall and spring, 3 credits

SPN 222 Spanish Conversation and Composition II

A course in the active use of Spanish, with emphasis on excellence in the

written form.

Prerequisite: SPN 192 or SPN 195 or equivalent.

Fall and spring, 3 credits

L. Fainberg, Staff

SPN 223 Advanced Spanish Conversation

A course designed to develop and maintain complete fluency in the language.

Prerequisite: SPN 222 or equivalent.

Spring, 3 credits

Hispanic Linguistics, Literature and Culture

(Conducted in Spanish)

SPN 291 The Culture and Civilization of Spain

The evolution of the culture and civilization of Spain as seen through its history, art and literature.

Prerequisite: Permission of instructor.

Fall, 3 credits

C. Lida, J. McKenna

Prerequisite: SPN 192 or 195 or 197 or equivalent.

Fall, 3 credits

J. Giordano, P. Lastra, W. Little

SPN 292 The Culture and Civilization of Spanish-America

The evolution of the culture and civilization of Spanish-America as seen through its history, art and literature.

Prerequisite: Permission of instructor.

Spring, 3 credits

C. Lida

SPN 297 Introduction to Spanish Literature I

Readings in Peninsular literature from its origins through the 17th century.

Prerequisite: SPN 192 or 195 or 197 or equivalent.

Fall, 3 credits

A. Francis, W. Little, I. Zavala

SPN 296 Introduction to Spanish-American Literature

Readings in Spanish-American literature from the Colonial period to the present.

SPN 298 Introduction to Spanish Literature II

Readings in Peninsular literature from the 18th century to the present.

Prerequisite: SPN 297.

Spring, 3 credits

A. Francis, W. Little, J. McKenna, I. Zavala

Advanced Courses

(conducted in Spanish)

The topic to be studied in courses SPN 301, 302, 311, 321, 331, 332, 341, 342, 350 will appear in the Class Schedule, and a description of the specific contents will be available one semester in advance in the Department. Each course may be repeated for credit as the subject matter changes.

SPN 301, 302 Topics in Spanish Linguistics

The specific content of these courses will be announced each semester, but this heading may include any of the following: Advanced Composition and Stylistics; Phonetics; History of the Spanish Language; Applied Linguistics for Secondary School Teachers.

Prerequisite: SPN 198 or SPN 222 or equivalent.

Fall and spring, 3 credits each semester

R. de la Campa, L. Fainberg

SPN 311 Topics in Medieval and Renaissance Literature and Culture

Readings and discussion of major literary works in Spanish within the Medieval and Renaissance periods and their interrelation with the cultural context. Topics will vary. May be repeated.

Prerequisite: SPN 297.

Fall or spring, 3 credits

L. Fainberg, A Francis

SPN 321 Topics in Golden Age Literature and Culture

Readings and discussion of major literary works within the Golden Age period (16th and 17th centuries) and their interrelation with the cultural context. Topics will vary. May be repeated.

Prerequisite: SPN 297.

Fall or spring, 3 credits

A. Francis, V. Llorens, I. Zavala

SPN 331 Topics in 18th and 19th Century Peninsular Literature and Culture

Readings and discussion of major literary works of the 18th and 19th centuries in Spain and their interrelation with the cultural context. Topics will vary. May be repeated.

Prerequisite: SPN 298.

Fall or spring, 3 credits

W. Little, V. Llorens, I. Zavala

SPN 332 Topics in Spanish-American Literature and Culture from the Colonial Period to 1880

Readings and discussion of major literature works in Spanish-America within the Colonial, the Independence and the Romantic periods and their interrelation with the cultural context. Topics will vary. May be repeated.

Prerequisite: SPN 296.

Fall or spring, 3 credits

J. Giordano, P. Lastra, C. Lida

SPN 341 Topics in Peninsular Literature and Culture from 1898 to the Present

Readings and discussion of major literary works in Spain from the Generation of 1898 to the present and their interrelation with the cultural context. Topics will vary. May be repeated.

Prerequisite: SPN 298.

Fall or spring, 3 credits

W. Little, V. Llorens, J. McKenna, I. Zavala

SPN 342 Topics in Spanish-American Literature and Culture from 1880 to the Present

Readings and discussion of major literary works in Spanish-America from the outset of modernism and naturalism to the contemporary period and their interrelation with the cultural context. Topics will vary. May be repeated.

Prerequisite: SPN 296.

Fall or spring, 3 credits

R. de la Campa, J. Giordano, P. Lastra

SPN 350 Topics in Caribbean Literature and Culture

Readings and discussion of relevant literary works in Puerto Rico, Cuba, and other Caribbean countries. Special emphasis will be given to the interrelation between literature and culture. Topics will vary. May be repeated.

Prerequisites: SPN 292 or SPN 296, or PRS 101 or IAS 121 and fluency in Spanish.

Fall or spring, 3 credits

R. de la Campa, J. Giordano, P. Lastra, I. Zavala

SPN 381 Fundamentals of Hispanic Bilingualism and Biculturalism

Studies in the forms of survival of the Hispanic culture in the United States and the identity crisis as experienced by the Hispanic communities in this country. This course will include a survey of written material (from journalism to poetry) reflecting this conflict, and a critical analysis of the current theories of Bilingualism and Biculturalism as applied to those communities.

Prerequisites: SPN 198 or SPN 221 or equivalent.

Fall, 3 credits

R. de la Campa, L. Fainberg

SPN 382 Contrastive Structures of English and Spanish

A study of the most frequent cases of

interferences between English and Spanish. The comparison of the phonology, morphosyntax and lexical structures of both languages, and the social factors that act upon them, will be emphasized. Prerequisites: SPN 198 or SPN 221 or equivalent.

Spring, 3 credits

R. de la Campa, L. Fainberg

SPN 399 Directed Individual Studies

(Formerly SPN 395, 396)

Individually supervised studies in selected topics of Hispanic language, literature and culture. May be repeated. Normally, no more than three credits are allowed toward the major requirements; other credits are considered as electives.

Fall and spring, 1 to 6 credits

Department of History

Professors: Werner T. Angress, Ernesto Chinchilla-Aguilar, Charles Hoffmann, Eric E. Lampard, Jackson T. Main, Joel T. Rosenthal (*Chairman*), Bernard Semmel, William R. Taylor, David F. Trask, Fred Weinstein

Associate Professors: Per A. Alin, Karl S. Bottigheimer, David B. Burner, Hugh G. Cleland, Ruth Schwartz Cowan, Daniel Fox (*Adjunct*), Richard F. Kuisel, Herman E. Lebovics, Robert H. G. Lee, Robert M. Levine, Clara E. Lida (*Joint*), Robert D. Marcus, John W. Pratt, Richard T. Rapp, Ruben E. Weltsch, Allan K. Wildman, John A. Williams

Assistant Professors: Elizabeth Garber, Helen Rodnite Lemay, Michael P. McCarthy, Stephen Stein, W. Burghardt Turner

Lecturers: Karl W. Demuth (*Adjunct*), Yasuo Sakata, George W. Schuyler (*Adjunct*)

The offerings in History fall mainly into the three regional-national fields of United States, Europe, and Latin America and the Expansion of Europe. There are also offerings in the Far East and the History of Science. Courses taught at the introductory level (numbered up to HIS 160) are designed to introduce students to the methods and problems of historical inquiry; those at the intermediate level (HIS 161-299) are the basic surveys of areas and periods; those at the advanced level (HIS 300-400 series) are meant to offer the student an opportunity to do more intensive reading, research, and writing.

Though the Department does not set prerequisites for its courses, it does recommend that students interested in a certain area move from lower to higher number courses as they gain experience. History majors and other students taking history courses as electives are advised to try a number of fields of history, at various levels of course offerings.

Each semester the Department issues a booklet with a detailed description of its offerings. Students interested in History, whether as a major, as a related social science course, or for general liberal arts purposes, are invited to read this booklet and to get advice from the Department's faculty.

Requirements for the Major in History

In addition to the general University requirements for the Bachelor of Arts degree, the following courses are required for the major in history:

	<i>Credits</i>
A. Study within the area of the major Ten one-semester courses of which at least six credits must be selected from Levels III or IV, excluding HIS 397 and 398.	30
<i>Notes on Group A</i>	
1. Included in the total 30 hours as prescribed above must be nine credits in non-U.S. history. No more than six credits from Level I may be credited toward the major requirements.	
2. At least 12 credits from Group A must be taken within the Department of History at Stony Brook.	
3. No transfer grade lower than a C may be applied toward the major requirement.	
B. Study in a related area.	
Two one-semester courses beyond the introductory level in a related discipline or disciplines.	6
<i>Total</i>	36

Note on Groups A and B

All courses taken to meet requirements A and B must be taken for a letter grade.

Honors Program in History

Departmental majors with a 3.0 average in history courses and related disciplines as specified in the major requirements are eligible to enroll in the history honors program at the beginning of their senior year.

The student, after asking a faculty member to be a sponsor, must submit a proposal to the department indicating the merit of the planned research. The supervising faculty member must also submit a statement supporting the student's proposal. This must be done in the semester prior to the beginning of the project.

The honors paper resulting from the student's research will be read by the sponsor and one other member of the department. If the paper is judged to be of unusual merit and the student's academic record warrants such a determination, the department will recommend honors.

Courses*

HIS 101 Introduction to European History: Pre-industrial

A study of continuity and change in European ideas and institutions between the Middle Ages and the French Revolution. Feudal society, the rise of cities, the Reformations, and the Old Regime will be discussed.

Fall, 3 credits

Analysis of the literature from the early contacts by explorers and settlers. Consideration of the effects of the resultant culture clash, the political and economic progress, treaty relations, the breaking of treaties, wars, the attitudes toward land ownership and how it was transferred. As much as possible the material will be drawn from native American literary sources.

Fall, 3 credits

HIS 102 Introduction to European History: Modern Europe

A study of European ideas and institutions during the 19th and 20th centuries: the growth of industrialism and of democracy; the Marxist challenge and the Russian Revolution; the great world wars and the waning of European hegemony.

Spring, 3 credits

HIS 107 America in the 1960's

An introduction to the study of history through an analysis of contemporary American politics and culture from the Eisenhower years to the present.

Fall, 3 credits

HIS 105 American Historical Writing

An introduction to American history through an examination of the varieties of historical writings about the American past.

Spring, 3 credits

HIS 119 The Urban Experience

An examination of the city in history with emphasis on the human experience. Topics will include politics, ethnic acculturation, race relations and city planning. The course will stress the interdisciplinary nature of urban history through a wide range of readings.

Spring, 3 credits

HIS 106 History of the Native Americans

History of the Native American from the pre-Columbian period to the present. The development of indigenous civilizations.

HIS 133 The Medieval Imagination

A study of how the people of the Middle Ages set themselves within the context of

*See p. 75, Information About Course Credit.

a Christian, anthropocentric universe, as expressed in the creative literature of the civilization.

Spring, 3 credits

HIS 134 Medieval and Renaissance Women

The history of women in medieval and Renaissance times. Topics will include dowries, witches, Byzantine empresses, courtly love, women in the Islamic world, Renaissance courtesans, the "ordinary" woman.

Fall, 3 credits

HIS 135 Science in History

An examination of scientific ideas in their influence on concepts of man and society, from the Cartesian-Newtonian mechanical model to Freudian psychology. Topics covered will be: mechanism and Lockeian psychology applied to law, government and citizenship; evolution and the struggle for existence applied to economic and political theory; Freudian psychology applied to social theory.

Fall, 3 credits

HIS 136 Technology in History

An examination of technological developments in their influence on social structure and social values. Topics covered will be: the industrial revolution; the role of technology in the formation of feudal society; the technological utopians of the 19th century; technology in the development of the American West, etc.

Spring, 3 credits

HIS 138 Perspectives in European History

A study of selected topics and debates in European history with special reference to a specific national case. Problems span the period from the rise of urban centers in the Middle Ages to the rise of fascism in the 20th century.

Spring, 3 credits

HIS 140 Perspectives of World History

A study of the processes and problems of global history. In the course, a narrative summary of information is subordinate to

a consideration of those historical authors who have attempted to analyze and interpret the recent period of world history.

Fall, 3 credits

HIS 150 Civilization of Israel I

History of Israel from its origins until the Bar-Kochba revolt. Emphasis will be placed upon Israel in its ancient Near Eastern background. Topics covered include origins of Israeli religious, political and social institutions. This course is identical with INT 150.

Fall, 3 credits

HIS 151 Civilization of Israel II

A cultural history of Israel from the rise of Islam until the formation of the state of Israel. Particular emphasis will be placed on Jewish-Gentile relations and on those currents in Jewish thought which culminated in the Zionist movement. This course is identical with INT 151.

Spring, 3 credits

HIS 160 History of American Education

An analysis of various approaches to the study of the history of American education through an examination of selected histories of education in America. Emphasis will be placed on developing an understanding of the material of the historical writing (i.e., the events and the characteristics of the events), the principle or principles according to which the subject has been subdivided, and the aims of the particular history. Histories of education selected for study will be chosen from among the writings of such authors as Bernard Bailyn, Maxine Greene, Lawrence A. Cremin, Raymond Callahan and others.

Fall, 3 credits

HIS 190 Sex in History

A study of the role of sex in various historical periods and civilizations. This course aims to introduce the student to comparative history—the study of different historical periods and civilizations through a theme that is common to them all.

Spring, 3 credits

HIS 191 American History to 1877

A survey of American History from the Age of Discovery to the end of Reconstruction. Some readings are drawn from American literature. Lectures are illustrated with paintings, maps and photographs of the period. There are recitation sections. Emphasis is on reasoning from evidence rather than memorization.

Fall, 3 credits

H. Cleland

HIS 192 United States Since 1877

A survey of modern American History from the end of Reconstruction to the present. Some readings are drawn from American literature. Lectures are illustrated with photographs, newsreels, and paintings of the times. There are recitation sections. Emphasis is on reasoning from evidence rather than memorization.

Spring, 3 credits

H. Cleland

HIS 193 Latin America to 1825

The Spanish and Portuguese colonies in the New World, with emphasis on exploration, settlement, institutions and the struggle for independence.

Fall, 3 credits

HIS 194 Latin America Since 1825

The evaluation of Latin America since independence, with emphasis on political, economic and social problems.

Spring, 3 credits

HIS 195 England from 1066 to 1688

The development of English society will be traced from the Norman Conquest to the "Glorious Revolution" with special attention to the feudal constitution, the evolution of Parliament, the Civil War and the Commercial Revolution.

Fall, 3 credits

HIS 196 England Since 1688

The transformation of English society by the Industrial Revolution, the development of parliamentary politics and democracy, the growth of imperial power and the readjustment to 20th century realities.

Spring, 3 credits

HIS 197 Chinese Civilization

This course surveys the origins and development of Chinese civilization from pre-history to the mid-nineteenth century. Emphasis will be on the intellectual, social and political foundations of traditional China.

Fall, 3 credits

R. Lee

HIS 198 Modern China

China from the mid-nineteenth century to the triumph of communism. Emphasis will be on China's modernization efforts and revolutionary changes.

Spring, 3 credits

R. Lee

HIS 200 The Ancient Near East and Early Greece

The development of early civilizations in the eastern Mediterranean area from the Neolithicum to the rise of the Persian Empire. Special emphasis will be put on Greece in the late Bronze Age and the Age of Homer.

Spring, 3 credits

HIS 201 History of Classical Greece and the Hellenistic World

A survey of the history of the Greeks and Greek civilization from the Archaic Age through its Classical and Hellenistic periods.

Prerequisite: HIS 200 or some background in early Greek history.

Fall, 3 credits

HIS 202 History of Rome

The development of the Roman Republic and Empire with an emphasis upon the institutions which bound the Roman Mediterranean together and upon the Greco-Roman civilization of the Empire.

Spring, 3 credits

P. Alin

HIS 204 Medieval History, 300-1100

European history from the decline of Rome to the 11th century, including the rise of Christianity, Byzantium, Islam, the

Gregorian reform and feudalism.
Fall, 3 credits

**HIS 205 The High Middle Ages,
1100-1400**

The High Middle Ages, including the crusades, courtly love, the 12th century Renaissance, scholasticism, Franciscanism and the Inquisition.

Spring, 3 credits

HIS 206 Humanism and Renaissance

The study of the Italian Renaissance with particular emphasis on the intellectual history of the period. Non-Italian thinkers who played a role in the intellectual movements of the time will also be considered.

Spring, 3 credits

HIS 207 The Age of Reformation

A study of pre-reformation currents such as mysticism and humanism, followed by an examination of the 16th century reformations. The course also includes economic and political changes in the 16th century.

Spring, 3 credits

HIS 208 Europe in the 17th Century

A comparative examination of the societies of western Europe in a period of marked stress and change.

Spring, 3 credits

HIS 209 Europe 1815-1914

European history from the Congress of Vienna to the outbreak of the First World War, with emphasis on political and social developments, but also including economic and cultural trends.

Fall, 3 credits

HIS 210 Europe 1914-1945

European history from the outbreak of the First World War to the post-World War II period, with emphasis on political and social developments, but also including economic and cultural trends.

Spring, 3 credits

HIS 211 Founding of Colonial America

The discovery and exploration of the New World, English overseas expansion and settlement in North America, problems of trade and imperial control (1660-1714), and the evolution of American provincial society.

Fall, 3 credits

HIS 212 American Colonial Society

Political, economic, social and cultural characteristics of the colonies during the 18th century.

Fall, 3 credits

**HIS 213 Age of the American
Revolution**

The social, economic and political history of the period 1763-1789. It stresses social and economic changes, the causes and results of the revolution and the formation of new state and national governments.

Spring, 3 credits

HIS 214 The Early National Era

Political, economic, social and cultural developments, from the American Revolution to the rise of Jackson.

Fall, 3 credits

HIS 215 The Age of Jackson

The era of Andrew Jackson which deals with the democratization of American society, the rise of a national economy, the impact of sectionalism and manifest destiny.

Fall, 3 credits

HIS 216 Civil War and Reconstruction

The course deals with the crisis of sectionalism, the rise of Southern nationalism and of the Republican Party, secession, the Civil War, abolition and the Reconstruction period.

Spring, 3 credits

**HIS 217 Recent U.S. History,
1877-1918**

The growth of industrialism in the United States and its impact on political, eco-

conomic, and intellectual life, and on American relations with the outside world through World War I.

Fall, 3 credits

HIS 218 Recent U.S. History, 1919-1972

The 1920's, the Great Depression and the impact of Keynesian thought, the New Deal, the rise of industrial unionism, World War II, the Cold War, and technological and social change are among the topics.

Spring, 3 credits

D. Burner

HIS 219 U.S. Urban History

Historical studies of urbanization in the United States, with special reference to demographic, economic and organizational features of urban and rural populations.

Prerequisites: HIS 191, 192.

Fall, 3 credits

HIS 220 History of Canada

Examines major issues in Canadian history: Is Canadian society basically distinct from American? How does Canada develop as a separate North American State? How do the French survive as a separate group in Canada?

Fall, 3 credits

HIS 221 History of Central America

Central America from pre-colonial times to the present: The Maya and Aztec civilizations; Spanish conquest; independence; efforts at political and economic unity; relations with the United States and other powers.

Spring, 3 credits

HIS 222 Modern Andean Republics

Central aspects of the political and intellectual development of the Andean countries from Columbia to Chile viewed within their social and economic environment in the 19th and 20th centuries.

Spring, 3 credits

HIS 224 Modern Mexico

The social, economic and political history of Mexico from 1876 to the present with emphasis on the background, development and aftermath of the Revolution of 1910.

Spring, 3 credits

HIS 226 Colonialism, Imperialism and Dependency in Latin America

A survey of the role of foreign powers in Latin America, focussing on the 19th and 20th centuries. Themes to be considered will include indigenous nationalism, resistance, and ideological response to the status quo.

Fall, 3 credits

HIS 227 Colonial and Neo-Colonial Brazil

Aspects of Brazilian history, 1500-1889. The course will treat such themes as the transition of Portuguese political and cultural institutions to Brazil, the emergence of the Brazilian nation and the period of the Empire through 1889.

Spring, 3 credits

HIS 228 Modern Brazil

Brazil from 1889 to the present: the old Republic; the Liberal Alliance and the Vargas regime; post-Vargas Brazil; and social, economic and cultural developments will be examined.

Fall, 3 credits

HIS 229 Argentina Since 1810

The political, economic and social history of Argentina from the end of the colonial period to the present with special attention to the Rosas tyranny, the "Argentine miracle" of development from 1880 to 1914, and the background, evolution and aftermath of the Perón regime.

Fall, 3 credits

HIS 233 Early Modern England: Change and Reformation, 1509-1603

The development of English society from the reign of Henry VIII to the death of

Elizabeth; the decline of medieval institutions, the course of the Reformation and its impact upon the political, economic and intellectual life.

Fall, 3 credits

**HIS 234 Early Modern England:
Revolution and War, 1603-1714**

An inquiry into the source, nature and outcome of the English Revolution. Topics will include the Parliamentary struggles of the 1620's, the civil war of the '40's and the re-establishment of stability in 1688.

Spring, 3 credits

**HIS 235 18th Century England,
1714-1815**

The beginning of the transformation of England from a traditional to a modern industrial society; parliamentary government; the commercial, agricultural and industrial revolutions; the Methodist revival; the Scottish Enlightenment; and the French Revolution.

Spring, 3 credits

**HIS 236 England, 1782-1867:
Industrialism, Reform, and
the Advent of Democracy**

England from the old regime and early industrialism to the coming of democracy and the emergence of the Workshop of the World; romanticism; reform; the liberal outlook; free trade and the Pax Britannica.

Fall, 3 credits

**HIS 237 Modern Britain, 1867 to the
Present; England in the Age
of Democracy**

English society from the era of Gladstone and Disraeli to the present; the new liberalism; the rise of socialism; imperialism; the wars against Germany; the welfare state; the decline of Britain's international position.

Spring, 3 credits

**HIS 239 Ireland from St. Patrick to
the Present**

A survey of the history of Ireland with emphasis upon its colonization and the

subsequent emergence of an independent, though troubled and fragmentary, national state.

Spring, 3 credits

HIS 240 History of the British Empire

Examines British control over dependencies in Africa, Asia and the Pacific since the 18th century, through comparative study of imperial advance, colonial policy, plural societies, resistance, transfer of power.

Fall, 3 credits

HIS 241 Kievan and Muscovite Russia

Russian history from 10th century origins through the 17th century. Particular attention will be centered in Kievan civilization, the Tatar yoke, the rise of the Muscovite service state and the Time of Troubles.

Spring, 3 credits

HIS 242 Imperial Russia

The political, social and cultural developments from Peter the Great to the Russian Revolution with emphasis on the unique institutional structure of Tsarist Russia and the problem of its relations with the West.

Fall, 3 credits

HIS 243 Soviet Russia

The ideological and social background of the Russian Revolution and the evolution of Soviet rule, the problem of industrialization, the relations with the capitalist West and totalitarian control over society.

Spring, 3 credits

HIS 244 East Central Europe 1453-1945

A survey of the territorial belt between the German and Russian power bases; the Hapsburg Empire; the Eastern question; the national movements up to World War II.

Fall, 3 credits

HIS 245 Europe Since 1945

A study of contemporary Europe emphasizing political developments beginning with the Cold War, decolonization, the problems of post-industrial society, managed capitalism, and intellectual and cultural movements like existentialism and Marxist humanism.

Spring, 3 credits

HIS 246 The Holocaust: The Destruction of European Jewry, Causes and Consequences

The course deals with the rise of modern anti-Semitism and its political application in Nazi Germany. Topics covered include the destruction process, ghetto life, resistance, foreign response and the war crimes trials. This course is identical with INT 246.

Prerequisite: INT/HIS 151.

Fall, 3 credits

C. Rheins

HIS 249 European Economic History in the Pre-Industrial Age

European economic development from the Middle Ages to the 18th century. Topics include medieval agriculture, merchant capitalism and the rise of urban centers, Renaissance economy and society, the decline of the Mediterranean and the economic crises of the Age of Mercantilism.

Fall, 3 credits.

HIS 250 European Economic History in the Industrial Age

The causes and consequences of modernization are the subjects of this course. Alternative theories of development are used to analyze technological change, economic-demographic interrelationships, social effects of modernization, class structure and problems of underdevelopment.

Spring, 3 credits

HIS 253 Social and Intellectual History of Europe, 1648-1848

Social and political thought in post-Reformation Europe, the Age of Enlighten-

ment, with particular reference to the beginnings of modern science, empiricism, rationalism, the philosophical origins of the French Revolution, romanticism, nationalism, industrialization and Marxism.

Fall, 3 credits

HIS 254 Social and Intellectual History of Europe, 1848-Present

Social and political thought in post-1848 Europe with particular reference to the social and political implications of Darwinism, socialism, new conservatism, Freudianism and the varieties of existential thought.

Spring, 3 credits

HIS 255 Social History of Science

Survey of the various roles which science has played in European and American society in the past 300 years. Topics covered will include initial factors in the growth of science in the 17th century, the professionalization of science in the 19th century and the relationship between the scientific community and the government both now and in the past.

Fall, 3 credits

HIS 256 Expansion of Europe

The European influence on the wider world during the industrial age. Forms of European overseas settlement, conditions of conquest, local responses to the Europeans and the 20th Century liquidation of Europe's overseas empires will be studied.

Spring, 3 credits

HIS 257 History of the Physical Sciences I: Theories of the Universe

The development of theories of the universe from ancient Greece to the present day, emphasizing changes in ideas which occurred during the late Renaissance. Einstein's ideas and modern cosmologies will also be discussed. This course is intended for students with a scientific background.

Fall, 3 credits

HIS 258 History of the Physical Sciences II: The Structure of Matter

The course will trace the growth of alchemy in the Arabic Empire and the European Renaissance, chemistry in the 19th century, and quantum mechanics in the 20th century. The general patterns of change which emerged in physics and chemistry will be emphasized. This course is intended for students with a scientific background.

Spring, 3 credits

HIS 259 History of Biology

The course will examine ancient Greek ideas about the nature of life, the development of taxonomy, embryology, cytology, Darwinism, biochemical biology, and the debate between vitalism and mechanism. This course is identical with BIO 159.

Prerequisite: BIO 109, 110.

Fall, 3 credits

HIS 260 The Jews from the Conquests of Alexander to the Conquests of Mohammed

The history of the Jews under Hellenistic, Roman and Byzantine rule; the growth and decline of the second Jewish Commonwealth and the Jewish communities of Babylonia. This course is identical with INT 260.

Prerequisite: INT 150 or 151.

Spring, 3 credits

HIS 261 Intellectual History of China

A survey of major intellectual trends from ancient to contemporary China.

Fall, 3 credits

HIS 262 Chinese Communism

A detailed examination of the communist movement in China, from its inception to events in the People's Republic.

Fall, 3 credits

HIS 265 Japan Before the Modern Era

The course will examine the historical development of Japan in its major po-

litical, social, economic and cultural aspects from pre-history to the end of the Tokugawa Shogunate in 1868.

Fall, 3 credits

Y. Sakata

HIS 266 Modern Japan, 1868-Present

Political, social, economic and cultural history of Japan with emphasis upon the Meiji restoration, industrialization; its impact on society, imperialistic expansion, the Second World War and Japanese resurgence in the postwar era.

Spring, 3 credits

Y. Sakata

HIS 267 East Asian-U.S. Relations

A study of the major issues and incidents which affected the relations between East Asian countries and those between the United States and China or Japan in the 19th and 20th centuries. Focus will be on the changing images and the evolving moral and practical considerations that influenced the formulation of policies, both at the level of public opinion and in the decisions of the governments, in China, Japan, and the United States.

Spring, 3 credits

HIS 269 History of American Industrial Society to 1860

The economic and social development of North America and the United States from colonial settlement through early industrialization. Emphasis on changing population patterns, use of natural resources, technological advances in production and transport, the development of markets and the role of public policy.

HIS 270 Development of American Industrial Society Since 1860

The industrial transformation of economy and society since 1860. Emphasis is on factors contributing to economic growth and instability, the development of corporate organization and the changing character of public policy.

Spring, 3 credits

HIS 271 American Constitutional Origins

The course will examine the English and colonial foundations of American constitutionalism, formation of the federal Constitution, the instituting of new government and the rise of political democracy.

Fall, 3 credits

J. Pratt

HIS 272 American Constitutional Development

A study of constitutional change, emphasizing the dispute over the nature of the Union, effects of industrial growth and the rise of big government in the present century.

Spring, 3 credits

J. Pratt

HIS 273 Social and Intellectual History of the United States to 1865

A study of the development of American institutions and thought in the years before the Civil War.

Fall, 3 credits

HIS 274 Social and Intellectual History of the United States Since 1865

A study of the development of American institutions and thought in the years since the Civil War.

Spring, 3 credits

HIS 275 History of U.S. Foreign Relations, 1774-1900

American foreign policy and diplomacy from 1774 to 1900 in terms of acquisition and confirmation of independence; geographical expansion and economic growth; achievement of great power capabilities.

Fall, 3 credits

D. Trask

HIS 276 History of U.S. Foreign Relations, 1900 to the Present

American foreign policy and diplomacy from 1900 to the present in terms of: the imperial interlude; the cycle of violence associated with two world wars;

developments since World War II.

Spring, 3 credits

D. Trask

HIS 277 History of American Labor to 1900

A history of working people from colonial times through the industrial revolution to 1900. The influence of immigration, and of utopians, anarchists, and socialists is considered. Lectures are illustrated with paintings, photographs, blueprints, and other visual data from the period. There are recitation sections. Emphasis is on reasoning from evidence rather than the presentation of facts.

Fall, 3 credits

H. Cleland

HIS 278 History of American Labor Since 1900

A history of working people during the 20th century. The course considers such topics as the AFL, IWW, mass production, scientific management, the rise and decline of the Communist Party, the CIO, and labor in politics. Lectures are illustrated with photographs, newsreels, paintings, and other visual data from the period. There are recitation sections. Emphasis on reasoning from evidence rather than the presentation of facts.

Spring, 3 credits

H. Cleland

HIS 279 Afro-American History to Reconstruction

Designed to supplement a basic knowledge of U.S. history, this course will consider the particular relationship of the Afro-American to the social, political and economic development of the United States to Reconstruction.

Prerequisite: HIS 191 or 192.

Fall, 3 credits

HIS 280 Afro-American History from Reconstruction to the Present

The Afro-American after the failure of Reconstruction, resistance of the black community to oppression and second class status and the civil rights struggle

of the 1950's and 1960's and the current conflict.

Prerequisite: HIS 191 or HIS 192.

Spring, 3 credits

HIS 281 France Under the Old Regime, 1598-1787

An examination of the development of French society under Bourbon absolutism from the end of the religious wars to the final crisis of the Old Regime.

Fall, 3 credits

HIS 282 The Revolutionary Era in France, 1787-1815

An examination of the Revolution of 1789 and its transformation under Napoleonic dictatorship. Emphasis will be upon the political and social impact of the Revolution in France.

Prerequisite: HIS 281.

Spring, 3 credits

HIS 283 Modern France, 1815-1900

The French nation's search for definition from the Restoration to the Dreyfus affair, with much attention given to the social and economic background of political change.

Fall, 3 credits

HIS 284 Modern France, 1900-Present

The French nation's response to the traumas of world war, depression and decolonization, and the challenge of industrial society from the Dreyfus affair to the Fifth Republic.

Spring, 3 credits

HIS 285 Germany, 1806-1890

Germany from the Napoleonic period, through unification and the founding of the Empire, to Bismarck's dismissal.

Fall, 3 credits

HIS 286 Germany, 1890 to the Present

Germany from Bismarck's dismissal, through the Wilhelmian period, the First World War, the Weimar Republic and the Third Reich, to and beyond the Second

World War. Political and social aspects and economic and cultural trends will be included in the investigation.

Spring, 3 credits

HIS 287 History of Italy, 476-1960

The development of Italian civilization from the fall of Rome through the age of the city-states, the centuries of foreign domination, industrialization and the Risorgimento, fascism, and the "economic miracle."

Spring, 3 credits

HIS 290 History of Spain, 1492-1939

An analysis of the key aspects of Peninsular History from the rise of the Spanish Empire to the Civil War. Political developments will be set in their social, economic, cultural and international context. This course would be of interest to students of Latin American history.

Fall, 3 credits

HIS 291 History of Africa South of the Sahara

Africa, 800-1800; the quickening pace of internal change and external contact, 1800-1880; European conquest and administration, 1880-1945; the end of empire and the recovery of independence.

Spring, 3 credits

HIS 292 Population and the Family in Europe

Studies in population trends and the history of the family unit in Europe from the Middle Ages to the 20th century. Topics include the control of family size, family wealth, child-rearing, demographic crises, social class characteristics and theories of population change.

Fall, 3 credits

HIS 293 Medicine and Society Since 1789

A survey of ideas, innovators and institutions in medical thought and practice and the delivery of health care. The course begins with consideration of the impact of the ideas of the Enlightenment and the French Revolution on medicine

and concludes with assessment of the historical context of contemporary problems in health care. Most of the subject matter will be drawn from the history of the United States, but the Atlantic will be regarded as a bridge rather than a barrier.

Spring, 3 credits

HIS 294 History of New York State

A survey of the development of New York from the colonial period to the present, with special emphasis on the role it played in the development of the United States and the interaction between state and national affairs.

Fall, 3 credits

J. Pratt

HIS 299 Independent Readings in History

Qualified juniors and seniors may read independently in an approved program under the supervision of a faculty member. No student will be allowed to enroll in this course more than once in each semester of his junior and senior years.

Prerequisites: Upper division standing and permission of department.

Fall and spring, 1 to 3 credits

Staff

HIS 300 Mycenae, Crete, and Troy

A study of several problems relating to the prehistoric cultures of Greece, Crete and Anatolia with particular emphasis on the archaeological material but also using contemporary and later written sources.

Prerequisite: The course assumes some background in Ancient Near Eastern history.

Spring, 3 credits

HIS 306, 307, 308 Topics in European History

Subjects and periods, which will vary with student demand and faculty interest, will include such topics as the Renaissance, the Reformation, Conservatism, the Revolution Fascism, population and topics in particular national histories. May be repeated.

Prerequisite: Varying with subject. Consult departmental list of courses.

Schedule to be announced, 3 credits each

HIS 309 Topics in Medieval History

Selected topics in medieval history will be studied with attention to primary sources and current historiographic controversies and developments. May be repeated.

Prerequisite: Varying with subject. Consult departmental list of courses.

Schedule to be announced, 3 credits each

Fall, 3 credits

HIS 311-320 Topics in American History

Subjects and periods, which will vary with student demand and faculty interest, will include such subjects as colonial society, the revolutionary era, progressivism, urbanization, Afro-American history, Constitutional history, social and intellectual movements, labor history and the history of Native Americans. May be repeated.

Prerequisite: Varying with subject. Consult departmental list of courses.

Schedule to be announced, 3 credits each

HIS 330, 331 Topics in Latin American History

Subjects and periods, which will vary with student demand and faculty interest, will include such topics as cultural history, the independence movements, slavery and race relations, land tenure, the Catholic Church, and contemporary societies and revolutions. May be repeated.

Prerequisite: Varying with subject. Consult departmental list of courses.

Schedule to be announced, 3 credits each

HIS 351 Topics in the History of Science

Topics, which will vary with student demand and faculty interest, will include such subjects as the history of American science, the social history of science, the impact of Darwinism, modern physics,

and technology and social change. May be repeated.

Prerequisite: Varying with subject. Consult departmental list of courses.

Schedule to be announced, 3 credits each

HIS 355, 356 Topics in World History

Subjects and periods, which will vary with student demand and faculty interest, will include such subjects as the expansion of Europe, theories of imperialism, revolutionary and religious movements, the psychoanalytical interpretation of history, and slavery.

Prerequisite: Varying with subject. Consult departmental list of courses.

Schedule to be announced, 3 credits each

HIS 362, 363, 364 Topics in Asian History

Subjects and periods, which will vary with student demand and faculty interest, will include such topics as Japanese nationalism and expansion, Far Eastern diplomatic history, nationalism in Southeast Asia.

Prerequisite: Varying with subject. Consult departmental list of courses.

Schedule to be announced, 3 credits each

HIS 391-392 Senior Honors Project in History

A two-semester project for seniors. Arranged in consultation with the department, the project involves independent study and the writing of a paper under the close supervision of an appropriate instructor on a suitable topic selected by the student. Students who are candidates for honors will ordinarily take this course.

Prerequisite: Permission of department.

Fall and spring, 3 credits each semester
Staff

HIS 397 The Teaching of History

A study of history as a subject taught in secondary schools; the nature of the discipline; curricula models; scope and sequence of topics offered; new programs of history instruction, etc. Designed for prospective teachers of history in secondary schools.

Prerequisite: Five courses in history above Level I.

Fall, 3 credits

HIS 398 History Teaching Strategies

An examination of the instructional methods and materials for teaching history at the secondary school level. Designed for prospective teachers of history in secondary schools.

Prerequisite: HIS 397.

Spring, 3 credits

Colloquia in History

Readings and reports on selected topics of political, social, intellectual or economic history. The approach of each course will be comparative and will center around a broad theme chosen by the instructor in the subject area. Consult Departmental list of courses.

Prerequisite: Senior major standing.

HIS 410-413 Colloquia in American History

Fall/spring, 3 credits

HIS 430-433 Colloquia in European History

Fall/spring, 3 credits

HIS 421, 422 Colloquia in Latin American History

Fall/spring, 3 credits

HIS 461, 462 Colloquia in Asian History

Fall/spring, 3 credits

Interdisciplinary Program in Ibero-American Studies

Director: George W. Schuyler

Faculty Advisory Committee: Anthropology—*Phil C. Weigand*, Art—*Leopoldo Castedo*, Economics—*Dieter K. Zschock*, History—*Stephen J. Stein*, Hispanic Languages and Literature—*James B. McKenna*, Puerto Rican Studies—*Juan E. Mestas*, Sociology—*Terry Rosenberg*

The Ibero-American Studies Program is undertaking a comprehensive review of its curriculum and service activities with the goal of strengthening teaching and research on Latin America and the Caribbean. It also seeks to expand opportunities for study in Latin America, Spain and the Caribbean which are provided by the SUNY Overseas Academic Program in Medellin, Colombia, and by other SUNY programs. The Medellin program offers a limited number of internships in Colombian schools, hospitals, governmental agencies and private business and industry. Information about these programs is available at the Office of International Education, Library W-3522.

Interested students are directed to the courses listed below:

Anthropology

ANT 201 *Peoples of South America*
ANT 207 *Indians of Middle America*
ANT 209 *Ancient Civilizations of
Middle America*

ANT 219 *Caribbean Cultures*
ANT 258 *Ways to Civilization*
ANT 259 *Archaeology of Mexico
and Central America*
ANT 308 *Seminar in Latin American
Cultures*

Art

ART 212 *Baroque Art in Spain and Italy*
ART 214 *Ibero-American Platersque
and Baroque Art and
Architecture*

ART 215 *Latin American Art*
ART 216 *Modern Latin American Art*
ART 217 *Pre-Colombian Art*

Economics

ECO 225 *Economic Development*
ECO 284 *Topics in Area Studies
(Latin America)*

ECO 386 *Topics in Political Economy
(Latin America)*

History

- HIS 193 *Latin America to 1825*
HIS 194 *Latin America Since 1825*
HIS 221 *History of Central America*
HIS 222 *Modern Andean Republics*
HIS 224 *Modern Mexico*
HIS 226 *Colonialism, Imperialism and
Dependency in Latin America*
HIS 227 *Colonial and Neo-Colonial
Brazil*
HIS 228 *Modern Brazil*
HIS 229 *Argentina Since 1810*
HIS 290 *History of Spain, 1492 to 1939*
HIS 330, 331 *Topics in Latin American
History*
HIS 355, 356 *Topics in World History*
HIS 421, 422 *Colloquium in
Latin American History*

Puerto Rican Studies

- PRS 101 *The Culture of Puerto Rico*
PRS 102 *The Culture of Puerto Ricans
in the United States*
PRS 155 *A History of Puerto Rico*
PRS 202 *Educating the Puerto Rican*
PRS 220 *Government and Politics in
Puerto Rico*
PRS 295 *Topics in Puerto Rican
Studies*
PRS 299 *Directed Readings*

Hispanic Languages and Literature

- SPN 291 *Culture and Civilization of
Spain*
SPN 292 *Culture and Civilization of
Spanish-America*
SPN 296 *Introduction to Spanish-
American Literature*
SPN 297 *Introduction to Spanish
Literature I*
SPN 298 *Introduction to Spanish
Literature II*
SPN 301, 302 *Topics in Spanish
Linguistics*
SPN 311 *Topics in Medieval and
Renaissance Literature and
Culture*
SPN 321 *Topics in Golden Age
Literature and Culture*
SPN 331 *Topics in 18th and
19th Century Peninsular
Literature and Culture*
SPN 332 *Topics in Spanish-American
Literature and Culture from the
Conial Period to 1880*
SPN 341 *Topics in Peninsular
Literature and Culture from
1898 to the Present*
SPN 342 *Topics in Spanish-American
Literature and Culture from
1880 to the Present*
SPN 350 *Topics in Caribbean
Literature and Culture*
SPN 381 *Fundamentals of Hispanic
Bilingualism and Biculturalism*
SPN 382 *Contrastive Structures of
English and Spanish*

Courses*

IAS 121, 122 Introduction to Ibero-American Civilization I, II

A topical introduction to Ibero-American culture and civilization, emphasizing patterns of continuity and change as interpreted from the perspective of Ibero-American scholars and sources. The course will focus on three broad topics each semester such as: The Land and Its Legacy; The Clash of Traditions; Revolution and Reform; Conflict and Regionalism.

Fall and spring, 3 credits each semester
G. Schuyler and Staff

IAS 301, 302 Supervised Field Studies in South America

Students will undertake supervised field studies on social and cultural topics in Colombia. Each student will prepare a study plan in cooperation with the coordinator of the overseas academic program in Colombia. Students will prepare periodic written reports on the progress of their work.

Prerequisite: Acceptance in Overseas Academic Program in Medellin, Colombia.

G. Schuyler and Staff

IAS 401, 402 Colloquium in Ibero-American Studies

An upper level course designed to provide the student with an opportunity to discuss, research and write on a subject that interests him within the broad topic of Ibero-American culture which is chosen from the colloquium. Topics selected will deal with issues such as land reform, revolution, the Church, urbanization, and the military, in order to provide focus and enable the student to analyze his subject from an integrated disciplinary approach. May be repeated once with approval of the program director.

Prerequisites: Senior standing and permission of instructor.

Fall and spring, 3 credits each semester

Interdisciplinary Courses

Note: INT courses may not be used to fulfill general University requirements, except as noted.

INT 100 Academic Research

Provides a basic understanding of the information process through the study of classification schemes, research strategies, abstracting, use of indexes and abstracts, reference materials, government documents, monographs, serial literature and various automated retrieval

systems. Should be taken in conjunction with a course requiring a research paper. Fifty-item bibliography required. The course will be given twice during each semester, meeting three hours per week for half the semester.

Fall and spring, 2 credits. For elective credit only.

*See p. 75, Information About Course Credit.

INT 133, 134 Dance Technique and Composition I, II

(For course description, see alphabetical listing: Physical Education: Dance.)

INT 150, 151 Civilization of Israel I, II

(For course description, see alphabetical listing: Judaic studies: Courses in Hebrew and Civilization of Israel.)**

INT 160 Death

Lectures and discussions will include the following topics: the evolutionary significance of death; death as a social process; death and a philosophy of life; the fear of death; death in other cultures; the rhetoric of death.

Spring, 3 credits. For elective credit only.
N. Goodman

INT 201 Seminar: Basic Issues in Public Communication

(For course description, see alphabetical listing: Program on Communications in Society.)

INT 210 Intercultural Perspectives

An introduction to foreign area studies designed to: (1) identify and examine major problems associated with foreign area studies—studying "other" nations, societies, and cultures; (2) introduce selected conceptual models for studying culture areas; (3) develop the ability to apply these conceptual models to the analysis of nations, societies, and cultures, both others and our own; and (4) clarify one's own values, feelings and attitudes toward other nations, societies, and cultures.

Prerequisite: At least sophomore standing.

Spring, 3 credits

C. Hoffmann, E. Seifman

INT 233 Dance Technique and Composition III

(For course description, see alphabetical listing: Physical Education: Dance.)

INT 234 Dance Technique and Composition IV

(For course description, see alphabetical listing: Physical Education: Dance.)

INT 246 The Holocaust: The Destruction of European Jewry, Causes and Consequences

(For course description, see alphabetical listing: Judaic Studies: Courses in Hebrew and Civilization of Israel.)**

INT 260 The Jews from the Conquests of Alexander to the Conquests of Mohammed

(For course description, see alphabetical listing: Judaic Studies: Courses in Hebrew and Civilization of Israel.)*

INT 280 Practicum in Child Development

Students will work 9 hours a week in a full-day child-care center to gain practical experience in teaching, making materials and observing pre-school children. "Day-book" records will be kept and will be one of the bases for discussion in INT 281. This course will require the students to use the knowledge gained in INT 281 in a closely supervised situation. May not be repeated for credit.

Prerequisites: PSY 211 or equivalent and permission of instructor.

Corequisite: INT 281.

Fall and spring, 3 credits. For elective credit only.

INT 281 Seminar in Child Development

Students will meet weekly to discuss their experience in the child-care center and to learn basic principles of early childhood education and development relevant to the day care situation. Lectures and demonstrations of early childhood activities will emphasize language and cognition, social and motor behavior, "play," "arts and crafts" and various

**Fulfills general University requirement in social and behavioral sciences.

techniques for organizing group and individual energies. May not be repeated for credit.

Prerequisites: PSY 211 or equivalent and permission of instructor.

Corequisite: INT 280.

Fall and spring, 3 credits. For elective credit only.

INT 291, 292 Workshops in Media Consumership

(For course description, see alphabetical listing: Program on Communications in Society.)

INT 298, 299 Practicum in Newspaper Journalism

(For course description, see alphabetical listing: Program on Communications in Society.)

INT 301 Introduction to Marine Science

Four-week sessions based on the Isles of Shoals in the Gulf of Maine with daily lectures, laboratories and field work sponsored by SUNY Marine Sciences Research Center, Cornell University and

the University of New Hampshire. A general introduction to the marine sciences including marine biology and microbiology, fisheries, marine geology and physical oceanography, tools and techniques of oceanography. Competitive admissions.

Prerequisite: Minimum of one full year of college biology.

Summer, 5 credits. For elective credit only.

INT 302/FSY 297 Tropical Marine Science

Study of the tropical marine environment and its relation to the world ocean, with emphasis on marine fishes, and the geology and biology of coral reefs. Includes individual research projects under staff supervision. For further details, consult the International Studies Office. Prerequisite: Acceptance by selection committee of the Stony Brook Marine Biology Program at Discovery Bay, Jamaica. Requirements include substantial completion of a major in physical or biological science; some background in biology; and evidence of swimming proficiency.

Spring, 15 credits

Judaic Studies

Program Chairman: Samuel Berr

Lecturers: Ruth R. Beizer, Joel Beritz, Carl J. Rheins, Mira Rosenfeld

Detailed information and advice about the program may be obtained from the chairman.

Courses*

HBW 111, 112 Elementary Hebrew

An introduction to modern Hebrew as currently spoken and written in Israel, stressing pronunciation, speaking, listening comprehension, reading and writing.

Fall and spring, 3 credits each semester

HBW 151, 152 Intermediate Hebrew

An intermediate course in conversation, composition and the reading of texts in modern Hebrew.

Prerequisites: HBW 111, 112.

Fall and spring, 3 credits

R. Beizer

HBW 221 Advanced Hebrew I

A course in the active use of spoken and written Hebrew. Reading of classics in the Hebrew language. Discussion conducted mainly in Hebrew.

Prerequisite: HBW 152.

Fall, 3 credits

R. Beizer

HBW 222 Advanced Hebrew II

Readings in modern Hebrew authors. Oral and written reports. Discussion conducted mainly in Hebrew.

Prerequisite: HBW 221.

Spring, 3 credits

R. Beizer

HBW 285 Classical Hebrew

A study of texts in the classical dialect of Hebrew as found in biblical and extra-biblical sources.

Prerequisite: HBW 221.

Fall, 3 credits

HBW 290, 291 Genres of Biblical Literature

Critical reading in the original of representative specimens of various genres of Biblical prose and poetry. Among the literary types to be studied are the victory hymn, the proverb, the moral instruction, the love song, the fable, the narrative tale, the story cycle. Comparative material drawn from ancient Near Eastern literature will be used extensively. Attention will be given to problems of isolating distinct genres from a traditional Near Eastern perspective, rather than from contemporary Western perspective.

Prerequisites: HBW 152 and 285.

Fall (Poetry, HBW 290) and spring (Prose, HBW 291), 3 credits each semester

HBW 295 Readings in Talmud

An introduction to Talmud. Reading of selected passages in the original. Modern and medieval Hebrew commentaries will be referred to. May be repeated once with permission of instructor.

Prerequisite: HBW 221.

Spring, 3 credits

HBW 296 Readings in 20th Century Israeli Authors

Readings and discussions of the short stories of two generations of representative Israeli masters including Agnon, Hazzaz, Yishar and Megged. Different authors will be studied each semester. The course will acquaint students with the ideological, cultural and literary background of the literature of Israel. May be repeated once.

Prerequisite: Fluency in the Hebrew language.

Spring, 3 credits

R. Beizer

*See p. 75, Information About Course Credit.

INT 150 Civilization of Israel I

History of Israel from its origins until the Bar-Kochba revolt. Emphasis will be placed upon Israel in its ancient Near Eastern background. Topics covered include origins of Israelite religious, political and social institutions. This course is identical with HIS 150.

Fall, 3 credits

INT 151 Civilization of Israel II

A cultural history of Israel from the rise of Islam until the formation of the state of Israel. Particular emphasis will be placed on Jewish-Gentile relations and on those currents in Jewish thought which culminated in the Zionist movement. This course is identical with HIS 151.

Spring, 3 credits

C. Rheins

INT 246 The Holocaust: The Destruction of European Jewry, Causes and Consequences

The course deals with the rise of mod-

ern anti-Semitism and its political application in Nazi Germany. Topics covered include the destruction process, ghetto life, resistance, foreign response and the war crimes trials. This course is identical with HIS 246.

Prerequisite: INT/HIS 151.

Fall and spring, 3 credits

C. Rheins

INT 260 The Jews from the Conquests of Alexander to the Conquests of Mohammed

This course deals with the history of the Jews under Hellenistic, Roman and Byzantine rule; the growth and decline of the second Jewish Commonwealth and the Jewish communities of Babylonia. This course is identical with HIS 260.

Prerequisite: INT/HIS 150 or INT/HIS 151.

Spring, 3 credits

The Liberal Arts Major Program

This major, which offers no courses of its own, allows the student to draw upon the offerings of all departments to design a program that best meets his or her academic goals.

Requirements for the Liberal Arts Major (LIB)

In addition to the general University requirements for the Bachelor of Arts degree, the student must complete 60 course credits of work in courses beyond the introductory level, distributed as follows:

	<i>Credits</i>
Area or department A	12
Area or department B	12
Area or department C	9
Any area(s) or department(s)	27
	<hr/>
<i>Total</i>	60

Notes: At least 45 of the 60 credits must be in courses in the College of Arts and Sciences, and at least 36 of the 60 credits must be taken for a letter grade.

Advice in planning a program to meet the Liberal Arts major requirements may be obtained in the Undergraduate Studies Office.

Interdisciplinary Program in Linguistics

Assistant Professors: Frank Anshen, Mark Aronoff, Alice Davison, Beatrice L. Hall (*Chairman*)

Lecturer: Susan Chanover

The Program in Linguistics is concerned with the study of language as a central human attribute. Courses are offered in the major areas of modern linguistic theory.

Requirements for the Major in Linguistics

In addition to the general University requirements for the Bachelor of Arts degree, the following courses are required for the major in linguistics:

1. LIN 102 Introduction to Linguistics, and LIN 211 Introduction to Syntax.
2. Seven additional linguistics courses to be selected after consultation with the student's advisor. These should include LIN 201, 204, 221, 311.
3. One year of a non-Indo-European language. This requirement may be met by CHI 111, 112; HBW 111, 112; BLS 104, 105.
4. Two years of a modern foreign language. (Students should bear in mind that graduate programs in linguistics usually require reading proficiency in both German and French.)

The attention of students majoring in linguistics is directed to the following courses of interest to them in other departments:

ANT 102, 203, 204, 254, 271
EEL 111, 112
EGL 200, 202, 281
FLA 239
GER 202, 237
MSC 101
PHI 161, 311
POL 207
PSY 370
SGL 111, 112
SWE 111, 112
RUS 302

For further information about the linguistics program, consult the program chairman.

Courses*

LIN 102 Introduction to Linguistics

A survey of the field of linguistic inquiry; analysis of sound-structure, word-structure, and sentence-structure. The importance of these areas for children's acquisition of language will be considered.

Fall and spring, 3 credits

LIN 105 Nonstandard Varieties of English

An investigation of the phonological and grammatical structures used by speakers of some of the significant social minority groups in the New York area. Special attention will be paid to Black English, Puerto Rican English and the English of white migrant workers.

Fall and spring, 3 credits

F. Anshen

LIN 201 Phonetics

Introduction to the sounds used in human language and their production. Practice will be included in the production and recognition of the more commonly used sounds of the languages of the world; the structure of the human vocal tract, including the larynx, and the physical properties of sounds are discussed.

Prerequisite: LIN 102.

Fall, 3 credits

A. Davison

LIN 204 Phonology

The theory of sound systems of languages and the interaction of sounds in language.

Prerequisite: LIN 201.

Spring, 3 credits

M. Aronoff

LIN 211 Introduction to Syntax

An introduction to transformational-generative grammar: the formal theory of sentence structure.

Fall and spring, 3 credits

LIN 221 Linguistic Analysis

The application of methods of linguistic analysis to major bodies of data from a variety of languages.

Prerequisites: LIN 204, LIN 211/EGL 280.

Fall, 3 credits

M. Aronoff

LIN 241 History of Linguistics

Pānini, the Greek and Roman grammarians, 17th century rationalists and empiricists, 19th century European comparativists will be among the linguistic schools studied.

Prerequisites: LIN 211.

Spring, 3 credits

LIN 245 Introduction to the Methods of Teaching English as a Second Language

The application of linguistic methodology to teaching English to non-native speakers. Students will be given an opportunity to observe TESL classes on campus.

Prerequisites: LIN 102 and two years of a modern foreign language.

Spring, 3 credits

B. Hall

LIN 250 Introduction to Historical Linguistic Methodology

The application of linguistic theory to the comparative reconstruction of language

*See p. 75, Information About Course Credit.

systems.

Prerequisites: LIN 204, LIN 211.

Fall, 3 credits

B. Hall

LIN 261 Introduction to Sociolinguistics

An examination of the interaction between language and society. Examples will be drawn largely from English.

Prerequisites: LIN 102, LIN 211.

Fall and spring, 3 credits

F. Anshen

LIN 263 Language and Culture

The study of linguistic behavior as an instrument for anthropological research, description and explanation. This course is identical with ANT 263.

Prerequisite: ANT 102 or LIN 102.

Fall, 3 credits

LIN 301 Mathematical Aspects of Linguistics

An introduction to the mathematical concepts and procedures which underlie much contemporary linguistic practice.

Prerequisite: LIN 211.

Fall and spring, 3 credits

F. Anshen

LIN 304 Advanced Phonology

This course is a direct sequel to LIN 204. It covers advanced phonological theory and recent developments in phonology and related areas.

Prerequisite: LIN 204.

Fall, 3 credits

M. Aronoff

LIN 311 Advanced Syntax

A detailed consideration of syntactic problems in English and other languages. Introduction to generative semantics.

Prerequisite: LIN 211.

Fall, 3 credits

LIN 320 Discourse Analysis

An investigation of reference, presupposition and speech acts as they interact in the description of linguistic units.

Prerequisite: LIN 311.

Fall and spring, 3 credits

A. Davison

LIN 329 Educational Psycholinguistics

An examination of the psychology of language, the relations among languages, behavior and cognitive processes, and the specific contributions of psycholinguistics to educational practice. Psycholinguistic research on foreign language education, reading instruction, language arts curricula, the function of language in the classroom and the interrelation between cognitive development and linguistic development will be reviewed.

Prerequisites: A course in linguistics, in psychology, in research methodology, and advanced undergraduate standing.

Fall and spring, 3 credits

LIN 342 The Development of Linguistics in the 20th Century

This course will consider the major advances in linguistics from Saussure to Ross.

Prerequisites: LIN 102, LIN 204 and LIN 211.

Spring, 3 credits

LIN 345 Practicum in Teaching English as a Second Language

Students will be given the opportunity to apply the methodology learned in LIN 245 in small tutorial sections under the direction of a master teacher.

Prerequisite: LIN 245.

Fall and spring, 3 credits

S. Chanover

LIN 350 Seminar in Historical Linguistics

Examination of selected problems in the historical development of languages of interest to the members of the seminar.

Prerequisite: LIN 250.

Fall and spring, 3 credits

B. Hall

LIN 361 Field Methods in Sociolinguistics

Problems of sampling, interview techniques, construction and scoring of linguistic variables, and presentation of results will be studied in the context of a study by the class of the sociolinguistic patterns of a nearby community.

Prerequisite: LIN 261.

Spring, 3 credits

F. Anshen

LIN 371 Field Methods in Linguistics

Students will learn techniques of writing a grammar of a language unknown to them by working with a speaker of that language. This course is identical with ANT 371.

Prerequisites: LIN 201 and LIN 211.

Spring, 3 credits

LIN 381 The Structure of an Uncommonly Taught Language

An investigation of the phonology and syntax of either some language or some family of languages. May be repeated if a different language is covered.

Prerequisites: LIN 204, LIN 221 and LIN 311.

Fall, 3 credits

B. Hall

LIN 390 Special Topics in Linguistics

A seminar for advanced linguistics students, the topic of which will vary with student demand and faculty interest and which will include such topics as: naturalness in phonology, markedness theory; relative clause systems; direction of historical change; variation theory, etc. Topics will be announced each semester. The course may be repeated if the topic differs.

Prerequisites: LIN 204 and 311.

Fall and spring, 3 credits

Staff

LIN 399 Directed Readings in Linguistics

Qualified juniors and seniors in linguistics will be offered an opportunity to do independent work on topics in linguistics under the guidance of a faculty member. May be repeated.

Prerequisite: Permission of department.

Fall and spring, 1 to 4 credits

Staff

Mathematical Sciences

Undergraduate programs in the Mathematical Sciences are offered by the three departments of Applied Mathematics and Statistics, Computer Science, and Mathematics. Each department encourages its majors to take courses in the other two departments as well as in related fields in the social and the physical sciences.

The faculty of the Department of Mathematics is in the College of Arts and Sciences while the faculties of the Departments of Applied Mathematics and Statistics and Computer Science are in the College of Engineering. Students majoring in any of the Mathematical Sciences programs are academically in the College of Arts and Sciences. Upon graduation they receive Bachelor of Science (B.S.) degrees.

Secondary Teacher Preparation Program

Students may enroll in a program leading to New York State provisional certification in mathematics, grades 7-12. Institutional certification will be granted only through this program. Students should register with the Mathematics Department director of teacher preparation after completing MSM 151 or MSM 193, and before beginning the junior year. Requirements include:

1. Completion of one of the Mathematical Sciences majors (MSA, MSC, MSM).
2. Credit for, or exemption from, the following courses: MSM 201, 211; MSI 237, 238; MSA 201, 250 (or 251); MSC 101, (MSI 238 may not be counted toward major requirements.)
3. Completion of a program of practical work in the teaching of mathematics. In the junior year, as part of MSI 237, 238, each student will spend time in supervised observation of classes in local secondary schools. In the senior year, each student will take student teaching for a semester. Students will also participate in a coordinate mathematics teaching seminar (MSM 239), dealing with classroom organization and presentation of mathematics. These courses will not normally be available to others.
4. Completion of pre-professional course work in education. See departmental director of teacher preparation for details.

Engineering Mathematics Program

Students in engineering science are required to take the following courses: MSM 121, 122, 153, 154. Additional courses may be required in the individual engineering disciplines. See section devoted to College of Engineering and Applied Sciences for further information.

The three departmental programs follow in alphabetical order, together with a list of faculty and a description of course offerings for each department. Course descriptions for interdepartmental courses in mathematical sciences appear after the program of the Department of Mathematics.

Department of Applied Mathematics and Statistics

Professors: Edward J. Beltrami (*Chairman*), Yung Ming Chen, Daniel Dicker, Vaclav J. Dolezal, Irving Gerst, F. James Rohlf, Hanan C. Selvin, Ram P. Srivastav, Reginald P. Tewarson, Armen H. Zemanian

Associate Professors: James Frauenthal, Woo Jong Kim, Martin A. Leibowitz (*Director of Undergraduate Studies*), Gary Simon, Alan Tucker

Assistant Professors: Stephen Finch, William Yuan

The undergraduate program in Applied Mathematics and Statistics aims to give mathematically oriented students a liberal-arts education in quantitative problem-solving. The courses in this program survey a variety of mathematical theories that are commonly employed today by planners and researchers in government, industry, and science. While over half the applied math majors go to graduate school—mainly in statistics, operations research, management science, and health sciences—the department has been careful to make sure that the training its graduates receive is compatible with the changing mathematical needs of educational (secondary school) and industrial employers.

Although the department grew out of the Department of Applied Analysis in the College of Engineering, its undergraduate program emphasizes, as a result of student preference, mathematics related to computer science and the social sciences. The department does not have an Honors program or any specified tracks but relies instead on extensive personal advising to develop the right program for each student. The limited number of undergraduate courses offered serves as the nucleus for the varied individual programs of applied mathematics majors. These programs regularly include upper-division courses in Computer Science, Mathematics or Economics, or graduate-level applied mathematics courses.

Requirements for the Major in Applied Mathematics and Statistics

In addition to the general University requirements for the Bachelor of Science degree, the following courses are required for the major in applied mathematics and statistics:

1. MSM 121, 122, 151, 152 or MSM 191, 192, 193, 194
2. MSC 101
3. Twenty-four additional credits in courses designated MSA or MSI and numbered 200 and above. (A maximum of six of these credits may be replaced by an equal number of credits to be taken from approved mathematically oriented courses numbered 200 and above. Typical approved substitutions are: ECO 215, 216, 321; MSC 201; MSM 211; PSY 381, 382; PHY 343, 344.)

Recommendations for Students Majoring in Applied Mathematics and Statistics

The department encourages students to have a broad exposure to many types of mathematical reasoning and to its diverse roles in the social and natural sciences. During their first two years, students considering an MSA major are encouraged to take, besides the required calculus sequence: some physics (either PHY 131, 132 or PHY 101, 102 or PHY 103, 104), MSC 101 and one other computer course (competence in computer programming is essential for many professional careers), and some economics. At the end of their sophomore year or beginning of their junior year, students begin taking upper

division MSA courses, usually starting with MSA 201 and 251. At the same time, they are strongly encouraged to continue taking MSM and MSC courses and mathematically oriented courses in other departments, such as ECO 215 and PHY 343. For further details, potential majors should talk with the department's Director of Undergraduate Studies.

Undergraduates interested in the Mathematics of Networks and Special Functions of Applied Mathematics should consult the *Graduate Bulletin*.

Courses*

MSA 101 Introduction to Finite Mathematics

This course concentrates on mathematical concepts and techniques which are needed for the mathematical models currently being used in such fields as anthropology, biology, economics, linguistics, psychology and sociology. Topics to be covered are finite probability theory (including Markov chains), matrix algebra, graph theory; applications to mathematical models in the biological and social sciences will be employed throughout. This course may not be taken by students with credit for MSM 122 (such students should take MSA 110). Students may not receive credit for both MSA 101 and MSA 110.

Fall and spring, 3 credits

MSA 102 Elements of Statistics

The use and misuse of statistics in real-life situations; basic statistical measures of central tendency and of dispersion, frequency distributions, elements of probability, binomial and normal distributions, small- and large-sample hypothesis testing, confidence intervals, chi-square test and regression. This course may not be taken for credit by students with credit for MSM 151, MSA 250, MSA 251, PSY 162 or SOC 202. Students with a weak high school mathematics background should take MSA 101 first.

Fall and spring, 3 credits

MSA 104 Introduction to Probability

Introduction to continuous and discrete probability; basic properties of probability distributions, examples (from the physical sciences), expectations; binomial, Poisson, and normal distributions.

Prerequisite: MSM 121.

Corequisite: MSM 122.

Fall and spring, 1 credit

MSA 110 Introduction to Mathematical Modeling

Modeling techniques to be covered will include graph theory, difference equations, finite stochastic processes (including Markov chains) and elementary statistical sampling; necessary background in finite probability will be developed.

This course is designed for two types of students: the biological and social science student who views mathematical modeling as a necessary tool for analyzing problems in his own discipline; and the mathematically oriented student for whom mathematical models serve as a motivated introduction to applicable areas of modern mathematics. Students considering a major in Applied Mathematics and Statistics are encouraged to take this course. Students may not receive credit for both MSA 110 and MSA 101.

Prerequisite: MSM 121.

Spring, 3 credits

*See p. 75, Information About Course Credit.

MSA 145 Introduction to Biostatistics

Descriptive statistics; binomial, Poisson, and normal distributions; estimation; hypothesis testing; analysis of variance; regression; correlation. This course is designed for Biological Sciences majors and those planning graduate studies in medicine or public health.

Prerequisite: Completion of Biological Sciences mathematics requirements.

Spring, 3 credits

[MSI 155 Mathematics for Engineers II]

(See description under Interdepartmental Courses in Mathematical Sciences.)

MSA 201, 202 Finite Mathematical Structures I, II

This course introduces the student to graph theory and combinatorial analysis. The emphasis is on solving applied problems rather than on theorems and proofs. Techniques used in problem-solving will include generating functions, recurrence relations and network flows. This course develops the type of mathematical thinking that is fundamental to computer science and operations research.

Corequisite: MSM 151.

Fall and spring, 3 credits each semester

[MSI 201, 202 Advanced Calculus for Scientists I, II]

(See description under Interdepartmental Courses in Mathematical Sciences.)

MSA 210 Operations Research I: Deterministic Models

This course presents linear programming with a view towards its uses in economics and systems analysis. Linear-algebra and geometric foundations of linear programming; simplex method and its variations; primal-dual programs; formulation and interpretation of linear programming models, including practical problems in transportation and production control. Optional computer projects.

Prerequisite: MSM 151 or MSM 153.

Spring, 3 credits

MSA 220 Applied Differential Systems

Properties of ordinary differential equations with diverse applications to problems in the natural and social sciences. (No background in areas of application is required.) The course is designed for students in the mathematical sciences who are interested in basic uses of the calculus.

Prerequisite: MSM 151.

Fall, 3 credits

MSA 226 Numerical Analysis

Direct and indirect methods for the solution of linear and non-linear equations. Computation of eigenvalues and eigenvectors of matrices. Quadrature, differentiation and curve fitting. Numerical solution of ordinary and partial differential equations.

Prerequisites: MSC 101, MSM 151.

Fall, 3 credits

MSA 227 Approximation Theory

Smoothing of data, least squares methods, interpolation, polynomial approximation and quadrature formulas.

Prerequisite: MSM 152.

Spring, 3 credits

MSA 250 Introduction to Mathematical Statistics

Probability spaces, random variables, algebra of expectations, random sampling, law of large numbers, estimation of parameters, confidence intervals, regression, hypothesis testing. Students interested in probability theory and a more thorough treatment of statistical analysis should take MSA 251, 252. MSA 250 may not be taken for credit in addition to MSA 252 or ECO 220.

Fall and spring, 3 credits

MSA 251, 252 Probability and Statistics I, II

Finite, discrete and continuous probability distributions; random variables; conditional probability; multivariate distributions; laws of large numbers; central limit theorem. Statistical application: random sampling, estimation, significance

testing, hypothesis testing, regression correlation. Further topics. MSA 252 may not be taken for credit in addition to MSA 250 or ECO 220.

Prerequisite: MSM 122 or MSM 191.

Fall and spring, 3 credits each semester

MSA 301, 302 Principles and Techniques of Applied Mathematics I, II

Linear operators and spectral theory applied to differential operators. Eigenfunction expansions, Greene's functions and distributions: integral transforms.

Prerequisites: MSM 152 and permission of instructor.

Fall and spring, 3 credits each semester.

Not offered 1976-77.

MSA 325 Operations Research II: Stochastic Models

Methods and techniques for stochastic modeling and optimization, with applications to queueing theory, Markov chains, inventory theory, games and decisions.

Prerequisites: MSA 210 and MSA 250 or 251.

Fall, 3 credits

MSA 331 Mathematical Models in the Social Sciences

About ten models are discussed in detail. These involve preference rankings, ecology of competing species, market stability, stabilization of money flow, conditioned conformity, population growth, organization theory and optimal scheduling.

Prerequisites: MSM 151 and MSA 250 or 251.

Spring, 3 credits

MSA 333 Mathematical Economics I

Application of set theory, metric spaces, and topology to the theory of consumer choice, utility and production; neo-classical demand and production theory;

revealed preference and integrability; input-output models. The notions of set theory, metric spaces and topology will be developed as needed. This course is identical with ECO 331.

Prerequisites: MSM 152 and MSM 201.

Fall, 3 credits

MSA 351 Mathematical Models in the Physical Sciences

Methods of mathematical modeling with particular emphasis given to such areas as particle mechanics, continuum mechanics and wave propagation. Topics chosen will depend on the background and interests of the class.

Prerequisite: MSI 202.

Fall, 3 credits. Not offered 1976-77; interested students should take PHY 343.

MSA 353 Regression Theory

Classical least squares theory for regression including the Gauss-Markov theorem and classical normal statistical theory. An introduction to stepwise regression procedures and exploratory data analysis techniques. Analysis of variance problems as a subset of regression. Brief discussions of robustness of estimation and robustness of design.

Prerequisite: MSA 250 or MSA 252.

Fall, 3 credits

MSA 390 Research in Applied Mathematics

A course which will give the students an opportunity to be involved in an independent research project with supervision by the faculty. Permission to register will require that students have average grades of B in their courses and that they obtain the agreement of a faculty member to supervise their research. May be repeated once.

Prerequisite: Permission of instructor and department.

Fall and spring, 3 credits

Staff

Department of Computer Science

Professors: Arthur J. Bernstein (*Director of Undergraduate Studies*), Aaron Finerman (*Chairman*), Herbert L. Gelernter, Jack Heller, Richard B. Kiebertz, David R. Smith, Daniel H. Tycko

Associate Professor: Yechezkel Zalstein

Assistant Professors: Eralp Akkoyunlu, John C. Cherniavsky, Charles M. Fiduccia, Peter B. Henderson

Undergraduate Program in Computer Science

The undergraduate major in computer science is designed to combine a liberal arts program with sufficient pre-professional education in computer science to prepare the student for graduate study or for a career in the computing field. The intent is to offer the breadth of education which will enable students to place computing in the perspective of an extension of man's intellectual power, while offering the depth of education required to understand how to utilize the power of computing.

Students will learn concepts and skills needed for designing, programming and applying computer systems while learning the theoretical foundation of computer science. They will also have sufficient freedom in the program to pursue other academic interests in the liberal arts, sciences and engineering to complement their study of computer science. Many students will be able to utilize the flexibility of the program to satisfy the requirements of a second major for the baccalaureate degree.

Requirements for the Major in Computer Science

In addition to the general University requirements for the Bachelor of Science degree, the following courses are required for the major in computer science:

I. Required courses

A. MSM 101, 102, 201 and three other MSC courses above the 100 level.

B. MSM 121, 122, 151 (or MSM 191, 192, 193) and MSM 211.

C. MSA 201, 226 and 250 (or 251).

D. ESE 318.

II. Additional requirements

To achieve the necessary breadth in various fields, a minimum of 12 additional credits shall be chosen from among the course offerings in the natural sciences (not including mathematics) and in engineering, and a minimum of 30 credits shall be chosen from among the

course offerings in the social and behavioral sciences and in the arts and humanities. Courses in these categories may also be used to satisfy the general University requirements.

Suggestions for Elective Courses

Students are encouraged to concentrate their elective courses in no more than two disciplines chosen according to their secondary interests, so as to obtain depth in these areas. Students interested in the theory of computation are encouraged to take MSI 331 Logic. Those interested in computer hardware should consider ESE 346 Computer Communications. Other related courses can be found in the listings of the Departments of Mathematics, Applied Mathematics and Statistics, Electrical Sciences and the Interdisciplinary Program in Linguistics. Students should consult with faculty members of the Department of Computer Science early in their career in planning their program.

Pass/No Credit Option

A student may, with permission of his or her advisor, register for a Pass/No Credit grade in any course not used to satisfy the requirements of I above.

Sample Program (required courses only)

<i>Freshman</i>	<i>Sophomore</i>	<i>Junior</i>	<i>Senior</i>
MSM 121	MSM 151	MSA 201	MSA 250
MSM 122	MSM 211	MSA 226	ESE 318
MSC 101	MSC 201	MSC 205*	MSC 302*
MSC 102			MSC 304*

Courses**

MSC 100 The Societal Impact of Computers

A critical assessment of the role that computing and data processing play in contemporary society. Following an introduction to the information management capabilities that automation can provide, a study will be made of economic, legal, and moral issues involved in the utilization of these capabilities.

Fall and spring, 3 credits

MSC 101 Introduction to Computer Sciences

An introduction to programming and the solution of problems by computational algorithms. Students will gain experience by designing programs to solve a variety of problems chosen from scientific and non-scientific applications.

Fall and spring, 3 credits

MSC 102 Computer Organization and Programming

Explores the physical structures of a computer, machine representation of information, assembly language program-

*Other MSC courses may be substituted.

**See p. 75, Information About Course Credit.

ming, input and output communication, and introduces the student to systems programming techniques.

Prerequisite: MSC 101.

Fall and spring, 4 credits

MSC 201 Advanced Programming

Development of techniques in non-numeric programming with particular emphasis on data representation. Detailed treatment of recursive data structures, searching and sorting. Introduces concepts of modular design of programs, determination of program correctness, and analysis of execution efficiency.

Prerequisite: MSC 101.

Fall and spring, 3 credits

MSC 205 Introduction to business Data Processing

A basic introduction to the techniques of business data processing applications using concepts of sequential and direct access storage mediums. Typical data processing problems in the commercial area will be considered using two most frequently used higher level languages: PL/1 and COBOL. Concepts of unified data base construction and maintenance will be considered from the viewpoint of management information systems.

Prerequisite: MSC 102 or MSC 201.

Fall, 3 credits

A. Finerman

MSC 301 Research in Computer Science

A course which involves the student in an independent research project under the supervision of a faculty member. May be repeated.

Prerequisite: Permission of instructor and department.

Fall and spring, 3 credits

MSC 302 Structure of Digital Computers

Design of computer sub-systems such as memories, storage devices, control units, input-output facilities and arithmetic units. Microprogramming and overall system

design problems. Other advanced topics and alternative machine organizations.

Prerequisite: MSC 102, ESE 318.

Spring, 3 credits

D. Smith

MSC 303 Introduction to the Theory of Computation

An introduction to the abstract notions encountered in machine computation. Topics include finite automata, regular expressions and formal languages, with emphasis on regular and context-free grammars. Questions relating to what can and cannot be done by machines are covered by considering various models of computation, including Turing machines, recursive functions, and universal machines.

Prerequisites: MSC 102 and MSM 211.

Fall, 3 credits

C. Fiduccia

MSC 304 Introduction to Systems Programming

The course covers two major areas of systems programming, compilers and operating systems. Topics studied include formal description of programming languages, syntax analysis, code generation; interpreters, general resource allocation; memory management, scheduling, and file management.

Prerequisite: MSC 102 and MSC 201.

Spring, 3 credits

MSC 305 Advanced Business Data Processing

A continuation of MSC 205. Data processing applications in the commercial area will be considered using advanced features of the two most frequently used higher level languages: PL/1 and COBOL. Concepts of unified data base construction and maintenance will be considered from the viewpoint of the use of sequential and direct access devices, construction of logically self-defining files, list structures on direct access devices, and hierarchical and network structures.

Prerequisite: MSC 205.

Spring, 3 credits

MSC 352 Heuristic Programming and the Simulation of Intelligent Behavior by Machine

Topics covered include: critique of artificial intelligence research; state-space problem representations and search algorithms; game-playing programs; theorem-proving programs; programs for the

study and simulation of cognitive processes and pattern recognition. Further topics in current research as time permits.

Prerequisites: MSC 201 and MSC 303.

Spring, 3 credits

H. Gelernter

Department of Mathematics

Professors: Alfred Adler, James Ax, William D. Barcus, Leonard S. Charlap (*Director of the Graduate Program*), Jeff Cheeger, Raouf Doss, Ronald G. Douglas, Hershel Farkas, Detlef Gromoll, Mikhaell Gromov, C. Denson Hill, Irwin Kra (*Chairman*), Michio Kuga, William G. Lister, Bernard Maskit, Wolfgang Meyer, Stanley J. Osher, Anthony V. Phillips, Joel D. Pincus, Chih-Han Sah, James Simons, Elvira Rapaport Strasser, Peter Szűsz

Associate Professors: Sylva Cohn (*Director of the Teacher Preparation Program*), David Ebin, William C. Fox, Lowell Jones, Paul Kumpel, Henry B. Laufer, Joel Spencer, John A. Thorpe (*Director of the Undergraduate Program*), Eugene Zaustinsky

Assistant Professors: Michael J. Cowen, Jack Morava

Instructor: John Palmer

The undergraduate program in mathematics is designed to prepare the student for graduate study, for secondary school teaching, or for certain positions in industry. Since the needs and interests of students will be at least as varied as their professional plans, the departmental requirements are designed to allow the student a great deal of flexibility in selecting courses. The department has designed two tracks for its majors: a standard track especially appropriate for students preparing for a Ph.D. program in pure mathematics and a track for students preparing for a career in high school teaching.

Requirements for the Major in Mathematics

In addition to the general University requirements for the Bachelor of Science degree, the following courses are required for the major in mathematics:

1. Either MSM 121, 122, 151, 152, 201 or MSM 191, 192, 193, 194
2. MSM 211 Algebra I

3. Twenty-one additional credits accumulated from:
 - a. MSM courses numbered above 200, excluding MSM 261
 - b. MSI courses numbered above 200, excluding MSI 238, and
 - c. Up to six credits of MSA or MSC courses numbered above 200.

Note: All courses in the Mathematical Sciences used to fulfill the requirements for the major in mathematics must be taken for letter grade.

Recommendations for Students Majoring in Mathematics

The department encourages students majoring in mathematics to begin advanced work in the sophomore year, by enrolling for MSM 211 in the second semester of that year, for example. Prospective graduate students are encouraged to take graduate courses in mathematics during the junior and senior years.

For entering students with above average interest and ability in mathematics, the department directs attention to its honors calculus sequence MSM 191, 192, 193, 194. In particular, students entering with advanced placement in mathematics are encouraged to consider this sequence.

All students majoring in mathematics are encouraged to include in their program:

1. Introductory computer science courses MSC 101 and 102
2. Two years of a foreign language, preferably French, German or Russian
3. A year or more of physics (for example, the sequence PHY 101, 102, 151, 152)
4. The following advanced mathematics courses:
 - a. For students in the standard track: MSM 202 (unless student took MSM 194), 212, 301, 302, 312, 323
 - b. For students in the high school teacher preparation track: MSM 213, 241, 261; MSI 201, 202. (For details of the division's teacher preparation program, see listing under Mathematical Sciences.)

Honors Program in Mathematics

The honors program consists of two parts: completion with a grade point average of 3.5 or higher of a set of designated mathematics courses and participation in at least one semester of Senior Seminar.

A student interested in the honors program should apply formally to the director of the undergraduate program of the Mathematics Department during the junior year. The director of the undergraduate program in consultation with the student and his or her advisor will then designate a set of courses that will constitute the student's honors program. These courses will normally be: MSM 391 (or 392) and 212, 301, 302, 312, 323.

Every honors program must include either MSM 391 or 392, and must consist of six courses selected from among MSM 212 and MSM

courses numbered 300 or above. First year graduate courses may be substituted for the corresponding 300-level courses. Thus, a student may include in the program MSM 524 instead of MSM 301, and MSM 526 in place of MSM 302. Other programs must be formally approved by the director of the undergraduate program. Conferral of honors is contingent upon:

1. Achieving a 3.5 grade point average in the courses that constitute the student's honors program.

2. Active participation in Senior Seminar including at least two lectures on a topic chosen by the professor in charge of the Senior Seminar in consultation with the students in the seminar.

Courses*

Note: No mathematics course may be taken for credit, after credit has been obtained in a course for which it is a prerequisite. Exceptions will be made only with written permission of the director of the undergraduate program in mathematics.

MSM 101 Elementary Functions

Functions, graphing, algebraic operations on functions; analysis of rational, trigonometric and exponential functions. Solutions of first and second degree equations. Systems of equations. This course is intended for students who have taken at most three years of secondary school mathematics and whose program may require a greater proficiency in mathematics. It may not be counted toward the University requirement in natural science. May be repeated up to a limit of six credits.

Prerequisite: Permission of instructor.

Fall and spring, 1 to 3 credits

MSM 111 Introductory Mathematics I

A course designed to acquaint the student with the flavor of mathematics, what mathematics is and what modern mathematicians do, through consideration of specific topics chosen from: logic, set theory, elementary number theory, algebraic systems. MSM 111 and MSM 112 are intended primarily for those who do not plan to take more advanced courses in mathematics and may be taken in any order, but may not be taken for credit after MSM 201 or 211.

Fall, 3 credits

MSM 112 Introductory Mathematics II

A course designed to acquaint the student with the flavor of mathematics, what mathematics is and what modern mathematicians do, through consideration of specific topics chosen from: the limit concept—area, length, rates of change; combinatorial topology; geometric structures. MSM 111 and MSM 112 may be taken in any order, but may not be taken for credit after MSM 201 or 211.

Spring, 3 credits

MSM 121 Calculus I

The derivative and integral; fundamental properties, interpretations and computations for elementary functions. Introduction to techniques of integration.

Fall and spring, 4 credits

MSM 122 Calculus II

Integration techniques. Selected applications of the derivative and integral. First order differential equations. Taylor's formula. Infinite series. Introduction to partial derivatives and multiple integrals.

Prerequisite: MSM 121 or MSM 191. May not be taken for credit in addition to MSM 123.

Fall and spring, 4 credits

*See p. 75, Information About Course Credit.

MSM 123 Calculus II and Probability

Taylor's formula with remainder. Partial derivatives. Multiple integrals. Continuous and discrete probability: density; expectation; binomial, Poisson, uniform, exponential and normal distributions; moment generating functions; Poisson and normal approximation to binomial distribution; central limit theorems. This course is designed for social science majors and those students who do not expect to take the two-year calculus sequence. May not be taken for credit in addition to MSM 122.

Prerequisite: MSM 121 or MSM 191.

Fall and spring, 4 credits

MSM 151 Calculus III: Linear Algebra

Introduction to linear algebra; real vector spaces, subspaces, linear independence, bases, dimension, linear transformations, matrices. Applications to systems of linear equations and to linear differential equations. May not be taken for credit in addition to MSM 153.

Prerequisite: MSM 122 or MSM 123.

Fall and spring, 3 credits

MSM 152 Calculus IV: Multivariate Calculus

Differential and integral calculus in 2- and 3-space: directional derivatives, differential, Jacobian matrix, chain rule, multiple integrals, line and surface integrals, applications.

Prerequisite: MSM 151 or MSM 153.

Fall and spring, 3 credits

MSM 153 Calculus III: Differential Equations

Techniques for the solution of elementary ordinary differential equations. Special first order equations. Elements of vector spaces and matrix algebra. Linear equations with constant co-efficients. Linear systems. Power series solutions. Laplace transform. May not be taken for credit in addition to MSM 151. This course is especially recommended for engineering majors.

Prerequisite: MSM 122 or MSM 123.

Fall and spring, 3 credits

MSM 154 Mathematics for Engineers I

Partial derivatives and multiple integrals. Vector analysis, including theorems of Green, Gauss and Stokes. Introduction to functions of a complex variable: Cauchy-Riemann equations, Cauchy's theorem, Taylor and Laurent series, calculus of residues.

Prerequisite: MSM 153.

Spring, 4 credits

MSM 191, 192, 193, 194 Honors Calculus I-IV

This four-term sequence is designed for students with exceptional interest and ability in mathematics. The material covered will be substantially that of MSM 121, 122, 151, 152, 201 and 202. Using a more theoretical approach from the beginning, this sequence will give the student an earlier introduction to modern mathematics. Students taking this honors sequence may not take for credit: MSM 121, 122, 123, 151, 152, 201 or 202.

Prerequisite: Permission of instructor.

Fall (MSM 191, 193) and spring (MSM 192, 194), 4 credits each semester

MSM 201 Analysis I

The topology of metric spaces, limits, continuity, mean value theorems. The operations of differentiation and integration and their interchange with limits.

Prerequisite: Three semesters of calculus.

Fall and spring, 3 credits

MSM 202 Analysis II

Calculus of several variables: inverse and implicit function theorems, differential forms, submanifolds of n-space, Stokes' theorem.

Prerequisites: MSM 152 and MSM 201.

Fall and spring, 3 credits

[MSI 201, 202 Advanced Calculus for Scientists I, II]

(See description under Interdepartmental Courses in Mathematical Sciences.)

MSM 211 Algebra I

Basic concepts in abstract algebra: groups and rings together with their homomorphisms and quotient structures. Integral domains, unique factorization domains and principal ideal domains. Fields and polynomial domains over fields.

Prerequisite: Three semesters of calculus or MSM 192.

Fall and spring, 3 credits

MSM 212 Algebra II

Structure theory of finitely generated modules over principal ideal domains. Applications to group theory and to linear algebra. Further topics such as homological algebra, field theory, structure of rings.

Fall and spring, 3 credits

MSM 213 Theory of Polynomials

Detailed study of polynomials, including elementary Galois theory with emphasis on quadratic, cubic and quintic equations. Further topics such as real fields, Sturm's theorem.

Prerequisite: MSM 211.

Fall and spring, 3 credits

MSM 216 Linear Algebra

Vector spaces over fields, linear transformations, the orthogonal and unitary groups, canonical forms of matrices, the spectral theorem, multilinear algebra.

Prerequisite: MSM 151 or MSM 192.

Fall and spring, 3 credits

MSM 221 Number Theory

Congruences, quadratic residues, quadratic forms, continued fractions, Diophantine equations, number-theoretical functions and properties of the prime numbers.

Prerequisite: MSM 151 or MSM 192.

Fall, 3 credits

MSM 235 Ordinary Differential Equations

Description of differential equations and systems: linear and non-linear cases, reduction of higher order systems to first

order, vector fields and flows, discussion of existence and uniqueness of solutions, initial and boundary value problems. Well-posed problems. Review of linear systems with constant coefficients. Green's function and solution of inhomogeneous systems. Stability of linear systems and asymptotic behavior. Non-linear autonomous systems: analysis of critical points and limit cycles, Liapunov functions, Hamiltonian systems; existence theorems and iteration procedures for construction of solutions.

Prerequisite: 3 semesters of calculus

Spring, 3 credits

[MSI 237, 238 Foundations of Secondary School Mathematics I, II]

(See description under Interdepartmental Courses in Mathematical Sciences.)

MSM 239 Mathematics Teaching Seminar

Discussion of curricula, resources, methods and problems relating to the secondary school mathematics teacher. Required of student teachers in mathematics. Not open to others.

Corequisites: EDU 350, EDU 354.

Fall and spring, 1 credit

MSM 240 Geometry of Space Curves

Differential geometry of curves in the plane and in n -space. Winding number, Jordan curve theorem, Borsuk-Ulam theorem, 4-vertex theorem, isoperimetric inequality, curvature of a knot.

Prerequisite: MSM 152 or MSM 154 or MSM 192.

Fall, 3 credits

MSM 241 Geometric Structures

Formal geometries, their relationship and interpretations; projective, affine, Euclidean and non-Euclidean geometries.

Prerequisite: MSM 211.

Spring, 3 credits

MSM 261 History of Mathematics

A study of the development of mathematics from the Greeks up through the

development of calculus. Special attention will be devoted to the origins of calculus and to the contributions of 19th century mathematicians who put it on a firm foundation. This course may not be counted toward major requirements in the Mathematical Sciences. Nevertheless, majors in the division are encouraged to take it.

Prerequisite: MSM 122 or MSM 191.

Spring, 3 credits

MSM 292 Junior Seminar

This course is designed to give students an opportunity to learn some mathematics in a more seminar-like situation than is encountered in an ordinary class. Each year a topic will be selected usually comprising material not ordinarily presented in undergraduate courses. Students will lecture on the material.

Prerequisite: Permission of instructor, which may be contingent upon completion of certain courses, for example, MSM 201 or MSM 211.

Spring, 3 credits

MSM 301 Introduction to Complex Analysis

Holomorphic functions. Cauchy-Riemann equations. Cauchy theory. Maximum modulus principle. Taylor series expansions. Differential forms. Meromorphic functions. Laurent series expansions. Evaluation of integrals by the method of residues. Topics chosen from: harmonic functions, Dirichlet problem for the disc, Hilbert transforms.

Prerequisite: MSM 201 or MSM 193.

Fall and spring, 3 credits

MSM 302 Introduction to Real Analysis

Lebesgue and Lebesgue-Stieltjes measures and integrals and their fundamental properties. Comparison with Riemann integration. Basic properties of L_2 .

Prerequisite: MSM 202 or MSM 194.

MSM 303, 304 Non-Linear Ordinary Differential Equations

Singular points of vector fields, the degree and index of a mapping, limit cy-

cles, the existence and stability of periodic solutions, differential equations of second order, approximation methods including the Poincaré small parameter method, the Bogoliubov-Krylov-Mitropolsky asymptotic method, the method of averaging, and the method of Andronov and Witt. Oscillations of non-linear systems with slowly varying parameters, forced oscillations, subharmonic oscillations and entrainment, bifurcation of solutions. Hamiltonian systems, small denominators.

Prerequisites: MSI 201 and either MSI 202 or MSM 301.

Fall and spring, 3 credits each semester

MSM 305, 306 Partial Differential Equations

Fourier series, orthogonal functions, eigen functions of Sturm-Liouville operators. Green's functions, Fourier integrals, Laplace transforms. Second order partial differential equations: Laplace equation and the wave equation. Calculus of variations. Additional topics to be chosen from: asymptotic distribution of eigenvalues, spectral theory for compact operators on Hilbert spaces, special functions and group representations.

Prerequisite: MSI 201 or MSM 201.

Prerequisite for MSM 306: MSM 305.

Fall and spring, 3 credits each semester

MSM 312 Introduction to Topology

Introduction to point set topology: connectedness, compactness, continuity, etc. The fundamental group and covering spaces.

Prerequisites: Either MSM 201 or MSM 193, and MSM 211.

Fall and spring, 3 credits

MSM 323 Introduction to Differential Geometry

Geometry of surfaces in 3-space. Introduction to manifolds and to Riemannian geometry.

Prerequisite: MSM 202 or MSM 194.

Fall and spring, 3 credits

MSM 341, 342 Independent Study in Special Topics

A reading course for juniors and seniors. The topics may be chosen by the student with the approval of a supervising member of the faculty who will also take responsibility for evaluation. A topic that is covered in a course regularly offered by the department is not appropriate for independent study.

Prerequisite: Permission of the director of the undergraduate program.

Fall and spring, 3 credits each semester
Staff

MSM 391, 392 Senior Seminar

This course is designed for seniors who are majoring in mathematics and who have a serious interest in mathematical research. Each term a topic will be selected comprising material not presented in undergraduate courses. By the end of the term, students will be acquainted with a limited area of current research interest. The material will be presented in seminar style with students giving the lectures.

Prerequisite: Permission of department.

Fall and spring, 3 credits each semester
E. R. Stasser

Graduate Courses

Junior and senior mathematics students of above average ability are encouraged to take appropriate graduate courses in mathematics. Permission of the instructor is a prerequisite for registering in a graduate course. See *Graduate Bulletin* for details. The Graduate courses open to qualified undergraduates are:

- | | |
|--|---|
| <i>MSM 534 Algebra I</i> | <i>MSM 620, 621 Topics in Algebraic Topology</i> |
| <i>MSM 535 Algebra II</i> | <i>MSM 626, 627 Topics in Complex Analysis</i> |
| <i>MSM 538 Algebraic Topology I</i> | <i>MSM 632, 633 Topics in Differential Equations</i> |
| <i>MSM 539 Algebraic Topology II</i> | <i>MSM 638, 639 Topics in Real Analysis</i> |
| <i>MSM 542 Complex Analysis I</i> | <i>MSM 644, 645 Topics in Differential Geometry</i> |
| <i>MSM 543 Complex Analysis II</i> | <i>MSM 662, 663 Advanced Topics in Algebra</i> |
| <i>MSM 546 Differential Equations I</i> | <i>MSM 666, 667 Advanced Topics in Algebraic Topology</i> |
| <i>MSM 547 Differential Equations II</i> | <i>MSM 670, 687 Advanced Topics in Complex Analysis</i> |
| <i>MSM 550 Real Analysis I</i> | <i>MSM 674, 675 Advanced Topics in Differential Equations</i> |
| <i>MSM 551 Real Analysis II</i> | <i>MSM 678, 679 Advanced Topics in Real Analysis</i> |
| <i>MSM 552 Measure Theory and Probability</i> | <i>MSM 682, 683 Advanced Topics in Differential Geometry</i> |
| <i>MSM 566 Differential Topology</i> | |
| <i>MSM 568, 569 Differential Geometry</i> | |
| <i>MSM 602, 603 Topics in Algebra</i> | |
| <i>MSM 608, 609 Topics in Number Theory</i> | |
| <i>MSM 614, 615 Topics in Algebraic Geometry</i> | |

Interdepartmental Courses in Mathematical Sciences

MSI 155 Mathematics for Engineers II

Methods for the solution of the partial differential equations of physics and engineering, including Fourier series and Fourier transforms. Introduction to numerical methods.

Prerequisite: MSM 154 or junior standing in the College of Engineering.

Fall, 4 credits

MSI 201 Advanced Calculus for Scientists I

Ordinary differential equations; integration by power series; Bessel and Legendre functions. Expansion in series of orthogonal functions, including Fourier series. Introduction to partial differential equations of mathematical physics. Laplace's equation. Calculus of variations.

Prerequisite: MSM 152 or MSM 192.

Fall and spring, 3 credits

MSI 202 Advanced Calculus for Scientists II

Functions of a complex variable; calculus of residues, conformal mappings. Dirichlet problem. Review of orthogonal curvilinear coordinates. The divergence theorem. Solutions of classical partial differential equations of mathematical physics including applications of conformal mappings and the Laplace transform.

Prerequisite: MSI 201.

Fall and spring, 3 credits

MSI 237, 238 Foundations of Secondary School Mathematics I, II

Designed for students in the Secondary Teacher Preparation Program. The three areas of concentration of the course are: (1) a study of the general ideas which provide a means for organizing and understanding school mathematics, primarily algebra and geometry, (2) a study of methods and materials appropriate to the teaching of secondary school mathematics, and (3) experience with mathematics teaching through supervised observation and participation in mathematics classes in local schools. MSI 238 may not be counted toward major requirements in the division. Open to students registered in the Secondary Teacher Preparation Program of the division, and to others only if space permits.

Corequisites: For MSI 237, MSM 211; for MSI 238, MSM 201.

Prerequisite: For MSI 238, MSI 237.

Fall and spring, 3 credits each semester

MSI 331 Logic

A survey of the logical foundations of mathematics. Development of propositional calculus and quantification theory. The notions of a proof and of a model. The completeness theorem.

Corequisite: MSM 211.

Fall, 3 credits

Department of Music

Professors: Bulent Arel, Samuel Baron, Bernard Greenhouse, Billy Jim Layton, ^aJohn Lessard, David Lewin, Isaac Nemiroff, ^aCharles Rosen, Leo Treitler (*Chairman*)

Associate Professors: Edward A. Bonvalot, ^aSarah Fuller, Richard A. Kramer, David Lawton

Assistant Professors: Amy Kaiser, Lawrence Starr, Peter Winkler

^aOn leave.

Instructors: Daria W. Semegen, R. Peter Wolf

Lecturer: Anne Marie de Zeeuw

Performing Artists in Residence: Adele Addison, Ronald Anderson, Alvin Brehm, Martin Canin, Isadore Cohen, Raymond Des Roches, Timothy Eddy, David Glazer, John B. Graham, Paul Ingraham, Gilbert Kalish, Simon Karasick, Jack Kreiselman, Ronald Roseman, Charles Treger, Arthur Weisberg

The undergraduate major in music is designed as a balanced educational program which serves as preparation for professional careers and advanced training in performance, composition, scholarship and teaching.

Requirements for the Major in Music

In addition to the general University requirements for the Bachelor of Arts degree, the following requirements must be met for the major in music:

A. Admittance to the major

Any student wishing to major in music should apply to the department office for a theory placement interview and an audition in voice or instrument.

B. Study within the area of the major

1. Theory

- MUS 122 Musicianship II
- MUS 125 Modal Counterpoint I
- MUS 221, 222 Tonal Harmony I, II
- MUS 321 Analysis of Tonal Music
- MUS 322 Analysis of 20th Century Works

2. History and Literature

- MUS 241 Western Music Before 1600
- MUS 242 Western Music from 1600 to the Early 19th Century
- MUS 243 Western Music of the 19th and 20th Centuries

Three additional courses numbered 341 to 389 to be chosen in consultation with the student's advisor. The courses should be distributed among a range of historical periods.

3. Performance

At least one course from the groups MUS 161-189 Secondary Instrument or Voice or MUS 261-289 Primary Instrument or Voice every semester.

MUS 190 University Chorus or MUS 191 University Orchestra or MUS

192 University Band or MUS 293 Chamber Chorus for four semesters. (MUS 290 Collegium Musicum may count for two semesters of this requirement.)

Note: No more than 32 credits of individual instruction in instrument or voice may be included in the 120 credits required for the B.A. Degree.

C. Piano Proficiency

Each student will be expected to pass a piano proficiency test at the end of the first year as a music major.

D. Foreign Language

Students who intend to continue their studies beyond the B.A. degree are advised that most graduate music programs require a reading knowledge of French or German, often both. (Language courses may be taken under the P/NC option.)

Note: All courses used to fulfill the requirements for the major in music must be taken for letter grade.

Courses*

I. Courses Primarily for Students Majoring in Other Fields

MUS 101 Introduction to Music

The factors which create form and coherence in music will be studied from the listener's point of view. Concepts such as melody, harmony, counterpoint and rhythm will be illustrated by examples representing diverse historical periods and musical styles. No previous musical training is assumed.

Fall and spring, 3 credits

MUS 109 Rock Music

A study of the development of Rock from the end of World War II to the present. Emphasis will be upon the music and its connection with earlier folk and popular styles, with special attention to various syntheses of African and European traditions.

3 credits

P. Winkler

MUS 119 The Elements of Music

The notation of intervals, scales, chords, rhythms and meters. Practical exercises and ear training.

Fall and spring, 3 credits

A. de Zeeuw

MUS 190 University Chorus

(Formerly MUS 114)

Study and performance of a repertory from the Middle Ages to the present. More than four unexcused absences from rehearsals eliminates credit. May be repeated.

Prerequisite: Auditions.

Fall and spring, 1 credit

A. Kaiser

MUS 191 University Orchestra

(Formerly MUS 115)

Study and performance of works from the repertory of the concert orchestra. More than four unexcused absences from rehearsals eliminates credit. May be repeated.

Prerequisite: Auditions.

Fall and spring, 1 credit

D. Lawton

MUS 192 University Band

(Formerly MUS 116)

Study and performance of works from the repertory of the concert band. More

*See p. 75, Information About Course Credit.

than four unexcused absences from rehearsals eliminates credit. May be repeated.

Prerequisite: Auditions.

Fall and spring, 1 credit

S. Karasick

MUS 201 Music of the Baroque

(Formerly MUS 229)

The development during the late Renaissance of a new style will be traced, in Italy and elsewhere, through opera and oratorio, cantata and chorale, concerto, suite and trio sonata, to its ultimate expression in the works of Handel, Bach and their contemporaries.

Prerequisite: MUS 101.

3 credits

MUS 203 The Music of Beethoven

(Formerly MUS 233)

An exploration of the meaning and continuing relevance of one of the pivotal composers of the western world by the study of his symphonies, string quartets, piano sonatas and other works.

Prerequisite: MUS 101.

Fall, 3 credits

MUS 205 Music in the Romantic Era

(Formerly MUS 231)

The expressive art of the century between the birth of Schubert and the death of Brahms is examined in selected works of these and other figures, such as Berlioz, Mendelssohn, Chopin, Shumann, Liszt, Wagner and Verdi.

Prerequisite: MUS 101.

3 credits

MUS 207 Music and Drama

(Formerly MUS 232)

The ritual and dramatic uses of music from antiquity to the modern lyric theatre, with emphasis upon the operatic repertory from Mozart to Berg.

Prerequisite: MUS 101.

3 credits

MUS 209 Music of the 20th Century

(Formerly MUS 234)

An introduction to the variegated and rapidly changing trends of the present century, including impressionism, expressionism, neoclassicism, twelve-tone and other serialism, constructivism, chance music, electronic and computer music, as well as styles derived from folk music, jazz and other forms of popular music.

Prerequisite: MUS 101.

3 credits

MUS 215, 216 The Structural Principles of Music I, II

(Formerly MUS 243, 244)

An introduction to the language and basic structural concepts of the art through the study of such elements as melody, rhythm, harmony, counterpoint and form. Analysis, written exercises and discussion of theoretical principles. MUS 215 may be taken alone.

Prerequisite: MUS 119.

3 credits each semester

II. Courses Primarily for Music Majors

MUS 121 Musicianship I

Beginning music theory including notation of rhythms, scales, intervals, chords, sight singing and simple rhythmic exercises. Elementary melodic, rhythmic and harmonic dictation. Intended for students who are not prepared to enter MUS 122.

Prerequisite: Placement interview. Consult department as early as possible concerning dates.

Corequisite: MUS 160.

Fall and spring, 3 credits

A. de Zeeuw

MUS 122 Musicianship II

Intended to develop the student's aural perception. Problems in melodic, rhythmic, and harmonic dictation. Sight singing exercises including complex rhythms, tonal and modal melodies, modulation. Elementary analysis of a few basic musical forms.

Prerequisite: MUS 121 or the equivalent. Consult department as early as possible concerning dates of placement interviews.

Corequisite: MUS 160.

Fall and spring, 3 credits

A. de Zeeuw

MUS 125 Modal Counterpoint I

Counterpoint in 16th century style for two voices.

Prerequisite or corequisite: MUS 122.

Fall and spring, 3 credits

Staff

MUS 160 Basic Piano

(Formerly MUS 151)

Instruction in keyboard skills for beginners, intended for music majors who are unable to pass the department's piano proficiency examination. Two students meet forty-five minutes a week with the instructor, with four hours of individual practice required. May be repeated.

Prerequisite: Permission of instructor.

Fall and spring, 1 credit

Staff

MUS 161 to 189 Secondary Instrument or Voice

A forty-five minute individual lesson each week, with five hours practice required. Open to music majors and enrollment permitting, to other students with a serious interest in music. May be repeated. Prerequisites: Audition and permission of instructor.

Fall and spring, 2 credits

Faculty listed below give the auditions and assign the instructors.

MUS 161 Piano—M. Canin, G. Kalish

MUS 163 Harpsichord—P. Wolf

MUS 165 (167) Violin—I. Cohen,
C. Treger*

MUS 166 (168) Viola—J. Graham*

MUS 167 (169) Cello—B. Greenhouse,
T. Eddy*

MUS 168 (170) String Bass—
A. Brehm*

MUS 170 (174) Flute—S. Baron*

MUS 171 (175) Oboe—R. Roseman*

MUS 172 (176) Clarinet—D. Glazer,
J. Kreiselman*

MUS 173 (177) Bassoon—
A. Weisberg*

MUS 175 (183) Horn—P. Ingraham*

MUS 176 (184) Trumpet—
R. Anderson*

MUS 177 (185) Trombone—
S. Karasick*

MUS 178 (186) Tuba—S. Karasick*

MUS 180 (191) Percussion—
R. Des Roches*

MUS 189 (199) Voice—A. Addison*

MUS 190 University Chorus

(Formerly MUS 114)

Study and performance of a repertory from the Middle Ages to the present. More than four unexcused absences from rehearsals eliminates credit. May be repeated.

Prerequisite: Auditions.

Fall and spring, 1 credit

A. Kaiser

MUS 191 University Orchestra

(Formerly MUS 115)

Study and performance of works from the repertory of the concert orchestra. More than four unexcused absences from rehearsals eliminates credit. Primary students are eligible for MUS 565. May be repeated.

Prerequisite: Auditions.

Fall and spring, 1 credit

D. Lawton

MUS 192 University Band

(Formerly MUS 116)

Study and performance of works from the repertory of the concert band. More

*() indicates former number of a course.

than four unexcused absences from rehearsals eliminates credit. May be repeated.

Prerequisite: Auditions.

Fall and spring, 1 credit

S. Karasick

MUS 221, 222 Tonal Harmony I, II

(Formerly MUS 127, 128)

Practice in homophonic writing, including the harmonization of chorales.

Prerequisite: MUS 125.

Fall and spring, 3 credits each semester
Staff

MUS 231 Musicianship III

(Formerly MUS 123)

Sight singing and dictation (1 to 4 voices) of tonal, modal, and atonal examples with progressively complex rhythms. Exercises in aural analysis.

Prerequisite: MUS 122 or the equivalent.

Spring, 3 credits

A. de Zeeuw

MUS 239 Beginning Composition

(Formerly MUS 219)

Individual projects in composition discussed and criticized in class. Enrollment limited to eight. May be repeated once.

Prerequisite: Permission of instructor.

Fall and spring, 3 credits

Staff

MUS 241 Western Music Before 1600

(Formerly MUS 143)

The history of western music from antiquity to the late 16th century.

Prerequisite or corequisite: MUS 122.

Fall, 3 credits

MUS 242 Western Music from 1600 to the Early 19th Century

(Formerly MUS 144)

A survey of style and form from early

opera through the late quartets of Beethoven.

Prerequisite: MUS 241.

Spring, 3 credits

MUS 243 Western Music of the 19th and 20th Centuries

(Formerly MUS 249)

A survey of music from the early 19th century until the present day with emphasis on major currents of stylistic development.

Prerequisite: MUS 242.

Fall, 3 credits

MUS 261 to 289 Primary Instrument or Voice

One hour individual lesson each week, with 15 hours practice required. Open only to students with adequate preparation who demonstrate a professional commitment to the performance of music. May be repeated.

Prerequisites: Audition and permission of instructor.

Fall and spring, 4 credits

MUS 261 Piano—M. Canin, G. Kalish

MUS 265 (267) Violin—I. Cohen,
C. Treger*

MUS 266 (268) Viola—J. Graham*

MUS 267 (269) Cello—B. Greenhouse,
T. Eddy*

MUS 268 (270) String Bass—
A. Brehm*

MUS 270 (274) Flute—S. Baron*

MUS 271 (275) Oboe—R. Roseman*

MUS 272 (276) Clarinet—D. Glazer,
J. Kreiselman*

MUS 273 (277) Bassoon—
A. Weisberg*

MUS 275 (283) Horn—P. Ingraham*

MUS 276 (284) Trumpet—
R. Anderson*

MUS 277 (285) Trombone—
S. Karasick*

MUS 278 (286) Tuba—S. Karasick*

MUS 280 (291) Percussion—
R. Des Roches*

MUS 289 (299) Voice—A. Addison*

*() indicates former number of course.

MUS 290 Collegium Musicum

(Formerly MUS 145)

A workshop in the performance of music scored for small vocal and instrumental ensembles, with emphasis upon the repertory from the Middle Ages to 1750. May be repeated but will count toward fulfillment of major requirements only twice.

Prerequisite: MUS 122.

Fall and spring, 1 credit

MUS 291 Chamber Music (Secondary)

(Formerly MUS 259)

Ensembles formed by students enrolled in secondary instrument or voice, receiving approval of a faculty instructor and assignment of a repertory, who will rehearse two hours a week under the supervision of a graduate trainee. May be repeated.

Prerequisite: Permission of instructor.

Fall and spring, 1 credit

MUS 292 Workshop in Orchestral Ensemble

(Formerly MUS 257)

Rehearsal of the orchestral repertoire for brass, woodwinds, or percussion in separate groups or combined. May be repeated.

Prerequisite: Permission of instructor.

Fall and spring, 1 credit (For brass only, 1976-77)

S. Karasick

MUS 293 Chamber Chorus

(Formerly MUS 314)

Performance of works for small chorus. Repertory to be chosen from all periods. May be repeated.

Prerequisites: Audition and permission of instructor.

Fall and spring, 1 credit

A. Kaiser

MUS 321 Analysis of Tonal Music

(Formerly MUS 201)

The course will examine, through the study of selected works, the action and

interaction of harmonic progression, rhythm, meter, motive and line in defining and articulating tonal structures.

Prerequisite: MUS 222.

Fall and spring, 3 credits

MUS 322 Analysis of 20th Century Works

(Formerly MUS 203)

Music to be studied will be selected from representative works by Debussy, Bartok, Schoenberg, Stravinsky, Webern and others.

Prerequisite: MUS 321.

Fall and spring, 3 credits

MUS 331 Modal Counterpoint II

(Formerly MUS 211)

Counterpoint in 16th century style for three or more voices.

Prerequisite: MUS 125.

3 credits

MUS 332 Tonal Counterpoint

(Formerly MUS 213)

A study of the art of combining voices under the conditions of tonal harmony as observed in works from Bach through the Romantic composers.

Prerequisite: MUS 222.

3 credits

MUS 333 Fugue

(Formerly MUS 303)

Application of the skills of tonal counterpoint to fugal composition.

Prerequisite: MUS 332.

3 credits

MUS 334 Orchestration

(Formerly MUS 305)

The possibilities and limitations of the commonly used instruments. Conventions of notation. Practice in scoring for various ensembles.

Prerequisite: MUS 222.

3 credits

MUS 335 Analysis of Medieval and Renaissance Works

(Formerly MUS 205)

The course aims at an understanding of some of the principles underlying the structure of pre-tonal music through the study of a selection of works representative of important periods and styles up to the 16th century.

Prerequisite: MUS 222.

3 credits

MUS 339 Composition

(Formerly MUS 313)

Open only to students demonstrating sufficient aptitude and capacity for original work. May be repeated.

Prerequisite: Permission of instructor.

Fall and spring, 3 credits

B. Arel, B. J. Layton, J. Lessard, D. Lewin, I. Nemiroff, D. Semegen, P. Winkler

MUS 344 Secular Music of the Renaissance

A survey of secular vocal music from the songs of Dufay through the airs of Dowland. The 16th century Italian madrigal and the French chanson will receive particular attention. A central concern will be shifting relationships between music and poetry.

Prerequisite: MUS 241.

3 credits

MUS 350 Johann Sebastian Bach

(Formerly MUS 347)

A study of selected vocal and instrumental works.

Prerequisites: MUS 222, 242.

3 credits

MUS 354 Dramatic Music of the Baroque

(Formerly MUS 348)

Opera and oratorio of the 17th and early 18th centuries with emphasis on specific works by Monteverdi and Handel. Topics for discussion will include changing operatic conventions and relationships between opera and oratorio in the period.

Prerequisites: MUS 222, 242.

3 credits

MUS 358 Mozart

(Formerly MUS 350)

Mozart as catalyst to the development of the important genres (vocal and instrumental) in late 18th century Vienna: symphony, keyboard concerto, music for smaller ensemble, the various species of opera.

Prerequisites: MUS 222, 242.

3 credits

MUS 362 Beethoven

(Formerly MUS 351)

Works of differing scope and medium drawn from every period of his life will be studied.

Prerequisites: MUS 222, 242.

3 credits

MUS 366 Classical Chamber Music

(Formerly MUS 345)

The string quartets of Haydn, Mozart and Beethoven provide a central point of reference in the course.

Prerequisites: MUS 222, 242.

3 credits

MUS 368 Orchestral Music of the 19th Century

(Formerly MUS 354)

The course will trace the development of orchestral music from Beethoven's Ninth Symphony to the symphonies of Gustav Mahler and the tone poems of Richard Strauss. Solutions of composers who continued to work along classical lines—Schubert, Mendelssohn and Brahms—will be contrasted with those of composers who explored new relations between music and literature—Berlioz, Liszt, Strauss, and others.

Prerequisites: MUS 222, 243.

3 credits

MUS 370 19th Century Opera

(Formerly MUS 356)

A survey of important works in the development of Italian opera, French Grand Opéra and opéra comique, and German romantic opera, with particular attention to the later operas of Giuseppe Verdi

and the music dramas of Richard Wagner.

Prerequisites: MUS 222, 243.

3 credits

MUS 372 The Lied from Schubert to Wolf

(Formerly MUS 357)

This course explores a peak of German tradition in the matching of text and music.

Prerequisites: MUS 222, 243.

3 credits

MUS 374 The Generation of 1830

(Formerly MUS 362)

Chopin, Schumann, Liszt, Mendelssohn and Berlioz, including their stylistic sources in earlier music and influence on later generations.

Prerequisites: MUS 222, 243.

3 credits

MUS 380 Stravinsky

(Formerly MUS 363)

The changing stylistic manners adopted by a pivotal composer of the 20th century.

Prerequisites: MUS 222, 243.

3 credits

MUS 382 Schoenberg, Berg, Webern

(Formerly MUS 364)

Major topics for consideration will be Schoenberg's historical position and his influence as a teacher, the similarities and differences among the three composers, and the influence of each on later developments.

Prerequisites: MUS 222, 243.

3 credits

MUS 384 Major 20th Century Composers

(Formerly MUS 367)

An intensive study of one or more of those composers who have shaped the musical language of our epoch. May be repeated.

Prerequisites: MUS 222, 243.

3 credits

MUS 386 Music Since 1945

(Formerly MUS 369)

The course is designed as a broad survey of contemporary music, stressing the contributions of a large number of composers. The development of an analytical and critical vocabulary appropriate for this music will be a major concern. Problems posed by new media and new methods of notation and the question of historical roots for the new music will also be considered.

Prerequisites: MUS 222, 243.

3 credits

MUS 388 American Popular and Folk Styles

(Formerly MUS 370)

The development of the various vernacular musical styles of 20th century America. Focus will be on the nature of Blues, Jazz, Rhythm-and-Blues, Popular Song, Country Music and Rock, and on the cross-influences among them.

Prerequisites: MUS 222, 243.

3 credits

P. Winkler

MUS 390 Choral Conducting

(Formerly MUS 316)

Manual technique and the analysis and preparation of vocal scores for performance.

Prerequisites: MUS 222 and permission of instructor.

3 credits

A. Kaiser

MUS 391 Orchestral Conducting

(Formerly MUS 318)

Baton technique and the analysis and preparation of orchestral scores for performance.

Prerequisites: MUS 334, 390 and permission of instructor.

Corequisite: MUS 390, optional.

3 credits

D. Lawton

MUS 395 Vocal Repertory

(Formerly MUS 325)

Performance and analysis of works from the vocal repertory. May be repeated.

Prerequisite: Permission of instructor.

Corequisite: MUS 189 or MUS 289.

Fall and spring, 2 credits

A. Addison

MUS 399 Independent Project

Individual study under the guidance of a staff member leading to a major essay or composition. May be repeated.

Prerequisites: Permission of instructor and approval of department's Undergraduate Studies Committee.

Fall and spring, 1 to 6 credits

Department of Philosophy

Distinguished Professor: Justus Buchler

Professors: Sidney Gelber, Patrick Aidan Heelan, Donald Ihde (*Chairman*), Robert Sternfeld, Victorino Tejera, Harold Zyskind

Associate Professors: Antonio de Nicolas, David A. Dilworth, Patrick J. Hill, Dick Howard, Michael A. Slote, Marshall Spector, Walter Watson, Eddy M. Zemach

Assistant Professors: David B. Allison, R. Carleton Dallery, Clyde Lee Miller, Joan Ringelheim, Hugh Silverman, Donn C. Welton, Peter Williams

Lecturers: Sheldon Ackley, Robert Ray, Susan Wood

Requirements for the Major in Philosophy

In addition to the general University requirements for the Bachelor of Arts degree, the following courses are required for the major in philosophy:

<i>A. Study within the area of the major</i>	<i>Credits</i>
Philosophy courses distributed among five categories (Eligible courses are identified by a category number I through V which appears in parentheses after the title of the course.)	
Category I. Two courses in the history of philosophy, each devoted to a different historical period. (PHI 200 and 206 are recommended.)	6
Category II. Two courses defined in terms of topics or skills basic to all disciplines and common to various philosophic styles	6
Category III. One course defined in terms of a particular style, approach, movement or tradition	3
Category IV. Two courses relating philosophy to particular disciplines	6
	233

Category V. One course devoted to a single philosopher or text	3
Two additional courses chosen from any of the five categories	6
PHI 395 Senior Seminar	3
	<hr/>
<i>Total</i>	33

B. *Study in related areas*

Three courses in disciplines related to the philosophy courses chosen from Category IV above.

Note: No more than three philosophy courses below the 200 level may be used to meet the above requirements. Students who expect to pursue graduate study in philosophy should include in their program PHI 161, 200, 206 and one senior reading course chosen from PHI 397, 398, or 399.

Honors Program in Philosophy

To qualify for the honors program, a student must have an overall average of at least 3.0 and an average in philosophy of at least 3.5. To seek honors, a student must plan a program not later than the registration period of the senior year which meets with the approval of a department advisor. The program shall consist of three courses at the 300 level or higher, concentrated on related aspects of a central problem, and leading to a senior paper which will become the focus of an oral examination. Honors will be awarded upon passage of the examination.

Courses*

For details of staffing, specific content and reading lists, the student should consult schedules posted by the Philosophy Department before registration each semester.

Introductory Courses

These courses offer the student various ways to become acquainted with the nature and variety of philosophical inquiries. There are no prerequisites for any of these courses.

PHI 100 Concepts of Man (II)

An introduction to philosophy through readings and discussion on topics such as man's identity, man's understanding, man's values.

Fall and spring, 3 credits

D. Allison, R. Sternfeld, W. Watson

PHI 101 Introduction to Ancient and Medieval Philosophy (I)

Readings and discussion of selected texts of philosophers such as Plato, Aristotle, Plotinus, Augustine, Aquinas.

Spring, 3 credits

*See p. 75, Information About Course Credit.

PHI 102 Introduction to Modern and Contemporary Philosophy (I)

Readings and discussion of selected texts of philosophers such as Descartes, Hume, Kant, Hegel, Nietzsche, Wittgenstein, and Sartre.

Spring, 3 credits

PHI 103 Philosophic Problems (II)

An introduction to philosophy through an inquiry into one or more of the basic problems of philosophy.

Fall and spring, 3 credits

R. Ray

PHI 104 Contemporary Morality (IV)

An introduction to philosophy through inquiry into moral questions raised by contemporary personal and social issues such as political protest, sexual freedom, war and peace, new life-styles. Methods of philosophical analysis will be employed in studying these moral issues.

Fall and spring, 3 credits

C. L. Miller

PHI 105 Philosophy and the Healing Arts (IV)

An introduction to philosophy using both classical texts and recent writings bearing on medicine, various therapies, and related practices such as shamanism, social work and counseling. The concept of nature, the perception of morbidity, reason and experience, the doctor-patient relationship, the limits and extensions of the "medical model," the roles of the spoken word, the grounds of the Hippocratic Oath and other such vows.

Fall and spring, 3 credits

C. Dallery

Intermediate Level Courses

PHI 200 Ancient Philosophy (I)

Study of the major thinkers from Thales to Aristotle.

Prerequisite: Sophomore standing or one course in philosophy.

Fall and spring, 3 credits

V. Tejera, W. Watson

PHI 106 Radical Thought (IV)

A systematic historical and critical introduction to Marxism as a political theory and as a theory of action. Course concentrates on Marx's work and on its relation to other Marxists (e.g., Lenin, Trotsky, Luxemburg, Mao) and to the New Left.

Fall and spring, 3 credits

D. Dilworth, D. Howard

PHI 114 Introduction to Metaphysics (II)

An introduction to philosophy through study of some of the main topics of metaphysics, for example, mind and matter, appearance and reality, freedom and determinism.

Fall and spring, 3 credits

R. Sternfeld, E. Zemach

PHI 118 The Uses of Philosophy (IV)

Introductory study of the bearing of philosophical considerations on the special arts and sciences.

Fall, 3 credits

PHI 161 Introduction to Symbolic Logic (II)

This first course in logic emphasizes the development of systematic techniques for assessing the validity of arguments: truth tables and truth value analysis, Venn diagrams, elementary quantification theory and deduction in both the propositional calculus and quantification theory.

Fall and spring, 3 credits

M. Spector, S. Wood

PHI 201 Hellenistic and Roman Philosophy (I)

Study of representative writings of Stoicism, Epicureanism, Skepticism and Neo-Platonism.

Prerequisite: Sophomore standing or one course in philosophy.

Spring, 3 credits

W. Watson

PHI 204 Medieval Philosophy (I)

Study of the writings of major thinkers from Augustine to William of Ockham.

Prerequisite: Sophomore standing or one course in philosophy.

Spring, 3 credits

C. L. Miller

PHI 206 Modern Philosophy (I)

The shifting relationships between philosophy and science which characterize the modern period (1600-1800) with special attention to these issues: rationalism vs. empiricism, necessity vs. contingency, reason vs. skepticism, God vs. nature, metaphysics vs. experience. Extensive readings from Descartes, Vico, Spinoza, Leibniz, Locke, Berkeley, Hume, Kant.

Prerequisite: Sophomore standing or one course in philosophy.

Fall and spring, 3 credits

R. Sternfeld, V. Tejera

PHI 208 19th Century Philosophy (I)

Study of major representative figures of the 19th century such as Hegel, Schopenhauer, Marx, Mill, Nietzsche, Kierkegaard, Spencer and Comte.

Prerequisite: Sophomore standing and/or one course in philosophy.

Fall, 3 credits

D. Howard

PHI 209 Contemporary Philosophy II

A study of leading figures and themes in contemporary (20th century) philosophy. Readings from authors such as Wittgenstein, Heidegger, Merleau-Ponty and Quine.

Prerequisite: Sophomore standing or one course in philosophy.

Fall, 3 credits

W. Watson

PHI 210 Introduction to Indian Philosophy: Classical Texts (III)

Students will become acquainted with the main classical texts of India: Rig Veda, Upanishads, Buddhism and Yoga (2500 B.C. to 400 B.C.). The emphasis will be on the necessary and sufficient contextual and structural conditions of

the statements and actions of this tradition and on relating them to what may be implicit in the American experience.

Prerequisite: Sophomore standing and/or one course in philosophy.

Fall, 3 credits

A. de Nicolas

PHI 211 Introduction to Indian Philosophy: Philosophic Interpretations (III)

Textual analysis of the Gita in an effort to recover its models of knowledge, the multiple structures leading to them, and the meaning of the text. Since several systems of Hindu philosophy are here presupposed, some of these and related systems will be studied: Carvaka, Mimamsa, Nyaya-Vaisesika, Samkhya-Yoga and Vedanta (600 B.C. to 1400 A.D.).

Prerequisite: Sophomore standing and/or one course in philosophy.

Spring, 3 credits

A. de Nicolas

PHI 212 Introduction to Chinese Philosophy (III)

The course is a philosophical introduction and analysis of the main stages and modes of Chinese thought, both as reflective of the high attainment of civilization in the Chinese cultural matrix and as contributing to the contemporary dialogue between world philosophical perspectives. Classical Confucianism and Taoism; the development of Chinese Buddhism; Neo-Confucian reaction and integration in the Sung and Ming; China's reaction to the West and contemporary Maoism.

Prerequisite: Sophomore standing and/or one course in philosophy.

Spring, 3 credits

D. Dilworth

PHI 213 Philosophy of Art (IV)

A reflective and foundational study of the experience, nature and functions of art. Different hypotheses about the creative process are reviewed and tested for their ability to extend the enjoyment of art, for their appreciation of the mul-

multiple assumptions of the artist and for the basis they offer for critical judgments.

Prerequisite: Sophomore standing or one course in philosophy.

Spring, 3 credits

V. Tejera

PHI 215, 216 Political Philosophy (IV)

An inquiry into the function of philosophic principles in political thought and action, with readings drawn from such authors as Plato, Aristotle, Machiavelli, Spinoza, Hobbes, Locke, Kant, Hegel, Mill, and Dewey. Either semester may be taken independently of the other.

Prerequisite: Sophomore standing or one course in philosophy.

Fall and spring, 3 credits each semester

D. Welton

PHI 217 Philosophy of the Social Sciences (IV)

A study of the philosophical foundations of the social sciences, focusing on questions concerning the structures of social reality and the methodological and epistemological status of the social sciences.

Prerequisites: Sophomore standing, one course in philosophy, and one in the social sciences.

Spring, 3 credits

R. Ray

PHI 220 Philosophy of History (IV)

A critical examination of theories on historical processes and developments and an evaluation of such concepts as progress, cause, purpose and meaning in history. Pertinent materials will be drawn from historical and philosophic writings of such figures as Hegel, Nietzsche, Berdyaev, Collingwood and Randall.

Prerequisites: Two semesters of history and one course in philosophy.

Fall, 3 credits

V. Tejera

PHI 222 Philosophic Perspectives on Feminism (IV)

The course deals with a representative range of textual selections from Plato, Aristotle, J. S. Mill, Hegel, Kierkegaard

and Schopenhauer to Freud, Sartre, De-Beauvoir, Kate Millet and certain representative fictional texts in order to bring out the problematic of feminism in its experiential and its philosophic dimensions. Students will be expected to do work in the outlining of solutions which philosophy can contribute to the human and conceptual dilemmas suggested by these texts.

Prerequisite: Sophomore standing or one course in philosophy.

Spring, 3 credits

PHI 228 Philosophy of Religion (IV)

An inquiry into the function of philosophic principles in religious thought. The course examines basic philosophic structures for such thought. It makes use of readings drawn from such writers as Augustine, Hume, Kant, Whitehead and Buber.

Prerequisite: Sophomore standing or one course in philosophy.

Fall and spring, 3 credits

D. Dilworth, W. Watson

PHI 231 Philosophy of Perception (II)

An inquiry into the philosophical problems pertaining to the sensing, perceiving and observing of the world. Various historical solutions (e.g., phenomenism, representationalism, scientific realism, naive realism, etc.) will be examined. Special attention is given to contemporary views and to the impact of recent research (e.g., in the psychological and the biological sciences) on the issue in question.

Prerequisite: Sophomore standing or one course in philosophy.

Spring, 3 credits

D. Ihde, D. Welton, E. Zemach

PHI 234 Philosophy of Science: History (IV)

An historical study of the reciprocal relationships that have existed between natural science and philosophy in the west from ancient Greece to modern times. An understanding will be sought of the character of scientific and philosophical explanation through the study of various cosmological models of man,

nature and God, especially the mechanistic models and the collapse of this model in the first half of the 20th century.

Prerequisite: Sophomore standing or one course in philosophy.

Spring, 3 credits

P. Heelan

PHI 235 Philosophy of Science: Concepts (IV)

An inquiry into the function of philosophical principles in the natural sciences, with the focus on concepts such as space, time, causality and life as they are treated in important philosophic and scientific works.

Prerequisites: Two semesters of philosophy (PHI 161 is recommended).

Spring, 3 credits

M. Spector

PHI 237 Theories of Knowledge (II)

This course consists of a study of a variety of conceptions of the structure of knowledge, the roles of the knower, the various kinds and status of objects known, as found in classical and contemporary epistemologies.

Prerequisite: PHI 101 or 102 or 103.

Fall, 3 credits

M. Slote

PHI 238 Indian Buddhism: Its Essence and Development (III)

This course will focus on the relation between the Buddhist model of knowledge (with its historical variations) and its dependence on and variations from the previous Indian cultural idea of knowledge. This will be done against the background of Western models of philosophical knowledge in their historical constitution. Material studied will range from Buddha to Tantra.

Prerequisite: PHI 210 or 211.

Spring, 3 credits

A. de Nicolas

PHI 239 Chinese and Japanese Buddhism (III)

The course will trace the main philosophical and institutional stages of Chinese and Japanese Buddhism, with

emphasis on the latter. Topics: the transmission of Indian Mahayana Buddhism to China; the formation of such Chinese schools as T'ien-t'ai, Hua-yen, Pure Land, and Ch'an (Zen); the further transmission of such schools to Japan, their assimilation within, and formative influence on, Japanese culture. Japanese schools treated: Teudai, Shingon, Pure Land, Nichiren (Lotus), and Zen.

Prerequisite: Sophomore standing and/or one course in philosophy.

Spring, 3 credits

D. Dilworth

PHI 240 Japanese Philosophy and Aesthetics (III)

(Formerly PHI 307, 308)

This course traces the philosophical process of "modernization" in Japan, focusing on such philosophical and literary authors as Fukuzawa, Natsume, Mori, Watsuji, Nishida and the Kyoto School, and more recent thinkers such as Tanizaki, Kawabata, Mishima.

Prerequisites: Two courses in philosophy and junior standing.

Spring, 3 credits

D. Dilworth

PHI 241 Poetics and Rhetoric (IV)

A comparative study of philosophic concepts of poetics and rhetoric. Poetic theory will be studied as variously treating literature as expressive, imitative, pragmatic, and "pure" or objective. Rhetoric will be treated as stylistic ornamentation, propaganda, practical reasoning, and the basis of community. Special attention will be given to the distinction, identity, and overlap of poetic and rhetoric. Readings from classical and contemporary authors such as Plato, Aristotle, Sartre, and Perelman.

Prerequisite: Sophomore standing or one course in philosophy.

Spring, 3 credits

H. Zyskind

PHI 242 Concepts of Equality (IV)

The course examines concepts of equality that have developed as social ideals in the modern world. It pays special attention to current efforts in this country

to provide equal protection of the laws to racial, religious, sexual and economic minorities. It analyzes the values and theories upon which egalitarian ideals rest.

Prerequisite: Sophomore standing or one course in philosophy.

Spring, 3 credits

S. Ackley

PHI 245 Life, Death, and Eternity (IV)

Some of the ageless questions arising from man's awareness of his own mortality will be investigated using philosophical classics and writings in other fields. Readings from such authors as Plato, Epicurus, Augustine, Vico, Spinoza and Montaigne will be supplemented by materials from the mystical traditions and from contemporary American culture.

Prerequisite: Sophomore standing or one course in philosophy.

Spring, 3 credits

C. Dallery

PHI 247 Existentialism (III)

Readings in existential philosophy and literature with special emphasis on such themes as alienation, anxiety, nihilism, absurdity, the self, value, death, and immediacy. Existentialist categories will be used to interpret contemporary life-styles and culture.

Prerequisites: Sophomore standing and one course in philosophy.

Fall and spring, 3 credits

D. Allison

PHI 251 Philosophy of Mind (III)

The course applies techniques of contemporary analytic philosophy to problems in the philosophy of mind. Among the topics discussed are: the logical status of discourse about psychological phenomena and events and of discourse about other minds; philosophical materialism (the identity thesis), philosophical behaviorism and the thesis of physicalism; and the distinction between thoughts and sensations.

Prerequisite: PHI 101 or 102 or 103.

Spring, 3 credits

M. Slote

PHI 252 Ethical Inquiry (IV)

An investigation of selected ethical problems.

Prerequisites: Sophomore standing and one course in philosophy.

Spring, 3 credits

M. Slote

PHI 273 Literature and Philosophy (IV)

A study of the relations between literature and philosophy through an analysis of primary texts selected to demonstrate the precise nature of the relationship between the two disciplines. Topics will vary from term to term.

Prerequisite: One course in philosophy and/or sophomore standing.

Spring, 3 credits

H. Silverman

PHI 275 Philosophy of Law (IV)

An examination of the concept of law and the nature of legal reasoning. The course will explore the relationship of law to other central philosophical and social ideas, such as freedom, rights, morality, authority, welfare, property, justice, equality and constitutionalism.

Prerequisite: Sophomore standing or one course in philosophy.

Fall and spring, 3 credits

S. Ackley, P. Williams

PHI 291, 292 Individual Systems of the Great Philosophers (V)

A detailed study of the works of a single great philosopher. May be repeated.

Prerequisites: Sophomore standing and one course in philosophy.

Fall and spring, 3 credits each semester

PHI 293, 294 Analysis of Philosophic Texts (V)

Detailed analysis of a major philosophic text. May be repeated.

Prerequisites: Sophomore standing and one course in philosophy.

Fall and spring, 3 credits each semester

Advanced Level Courses

PHI 301 Metaphysics (II)

An inquiry into the first principles of all science, art and action as these are treated in representative classical and modern authors.

Prerequisite: PHI 114 or 200 or 206.

Spring, 3 credits

R. Sternfeld

PHI 303 The Surrounding World: Philosophy and Environment (IV)

A systematic study of how human beings experience the surrounding world of life-space, technological artifacts and nature. The present impact of technological culture on man's perception of his world and his beliefs about himself will be explored. This course will be interdisciplinary in scope, with readings from philosophy, architecture, zoo-biology, anthropology and literature.

Prerequisite: One course in philosophy, one course in natural or social sciences.

Spring, 3 credits

P. Heelan

PHI 311 Contemporary Philosophies of Language (II)

A discussion of current topics in the philosophy of language.

Prerequisite: One course in philosophy.

Fall, 3 credits

S. Wood

PHI 314 Phenomenology (III)

An investigation of the methods, concepts and history of phenomenology with particular emphasis upon its philosophical basis. Readings from the major works of representative phenomenologists such as Husserl, Scheler, Heidegger, Merleau-Ponty and Ricoeur are to be balanced by applications of phenomenological analysis to contemporary philosophical problems.

Prerequisite: At least two courses in philosophy.

Fall and spring, 3 credits

D. Allison, D. Ihde

PHI 317 Philosophy of Myth (IV)

Studies in myth are undertaken in a wide range of disciplines, from literature to anthropology to philosophy. This course will examine the structural forms of myth, the relation of myth to language and the role of myth in social and self-interpretation. In addition to the central emphasis upon a philosophy of myth, occasional lectures will be given by experts in other areas.

Prerequisites: Any combination of at least two courses in classics, anthropology, literature, psychology, sociology or religious studies plus at least one course in philosophy.

Fall, 3 credits

V. Tejera

PHI 318 The Philosophical Methodology of the Rig Veda (V)

This course will focus on a method for bringing out the implied philosophy of the Rig Veda on topics such as knowledge, expression, the need to structure experience and the different forms and insights generated by such structures; the embodied vision historical insights generate to guarantee man's possession of what constitutes his humanity.

Prerequisites: PHI 210 or 211, or two courses in philosophy, oriental history, anthropology, psychology or sociology.

Fall, 3 credits

A. de Nicolas

PHI 320 Philosophical Psychology (IV)

An examination of traditional philosophic theories concerning the nature of a person and their connection to such theories in psychology as psychoanalysis, medical models of mental illness and theories of behavior modification.

Prerequisite: One course in philosophy.

Fall, 3 credits

H. Silverman

PHI 321 Philosophic Bases of Argument (II)

An inquiry into how principles affect or determine the structure as well as con-

tent of an argument. The question is directed first to philosophic arguments, in readings from such authors as Plato, Hume and Nietzsche; and then to controversies or oppositions in special disciplines, in readings from such pairs as Herodotus and Thucydides, Lincoln and Douglas and R. S. Crane and Cleanth Brooks.

Prerequisite: PHI 241 or three courses in philosophy.

Fall, 3 credits

H. Zyskind

PHI 330 Morality and Law

An advanced study of the interaction of moral and legal principles and rules. Paternalism, the enforcement of morals, and the effect of law on morality will be investigated in relation to particular problem areas: medicine, sex, marriage, etc.

Prerequisite: PHI 242 or PHI 252 or PHI 275.

Spring, 3 credits

P. Williams

PHI 345, 346 History and Philosophy of Education (IV)

An inquiry into the function of philosophic principles in educational theories and institutions. The inquiry centers on the purposes of knowledge and education, the relations among the sciences and their organization into curricula and the ways in which knowledge is acquired and transmitted. This course is identical with EDU 345, 346.

Prerequisite: Senior standing.

Fall and spring, 3 credits each semester

P. Hill, W. Watson

PHI 362 Advanced Symbolic Logic (II)

This course covers such topics as: a natural deduction system of quantification theory including consistency and completeness proofs; axiomatic formal systems and associated concepts of consistency, completeness and decidability; elementary modal logic; and introductory

set theory.

Prerequisite: PHI 161.

Spring, 3 credits

S. Wood

PHI 390 Advanced Topics in Philosophy (II, III, IV)

An advanced course treating a specialized issue or topic in philosophy or in philosophy and another discipline. The content of the course will be announced before the start of the term. May be repeated.

Prerequisites: Upper division standing and permission of instructor.

Fall and spring, 3 credits

PHI 395 Senior Seminar

An intensive study of an issue, topic, figure, or historical period in philosophy intended to provide both a culminating experience and final integration for senior philosophy majors. This seminar will emphasize careful reading, rigorous discussion and extensive writing at an advanced level. The content of the seminar will be announced before the start of the term and students will be consulted on the content as it proceeds.

Prerequisite: Senior philosophy major status.

Fall and spring, 3 credits

C. L. Miller

PHI 397 Readings and Research in Methodology (Normally III)

Advanced level inquiry with individualized instruction in one particular philosophical style of reasoning. Consult undergraduate advisor for specific details. May be repeated.

Prerequisites: Senior philosophy major standing and permission of department.

Fall and spring, 1 to 6 credits

PHI 398 Readings and Research in the Uses of Philosophy (Normally IV)

Advanced level inquiry with individualized instruction in the application of philo-

sophical tools to one of the special disciplines. Consult undergraduate advisor for specific details. May be repeated.

Prerequisites: Senior philosophy major standing and permission of department.

Fall and spring, 1 to 6 credits

PHI 399 Readings and Research in the History of Philosophy (Normally V)

Advanced level inquiry with individualized instruction in the great philosophies of the past. Consult undergraduate advisor for specific details. May be repeated.

Prerequisites: Senior philosophy major standing and permission of department.

Fall and spring, 1 to 6 credits

Staff

Graduate Courses

Qualified seniors may take 500-level courses with the permission of the directors of undergraduate and graduate studies. Please consult the bulletin boards outside the departmental offices for course descriptions and prerequisites.

Physical Education

Associate Professors: Elaine H. Budde (*Chairman*), John W. Ramsey, Leslie F. Thompson, A. Henry von Mechow

Assistant Professors: Ronald Bash, Paul J. Dudzick, Susan P. Krupski, Richard Smoliak, Robert B. Snider, Sandra Weeden

Instructors: Noboyoshi Higashi (*part-time*), Cecilia Kalfur, George Lukemire (*part-time*), Masataka Mori (*part-time*), James Smith (*part-time*)

Physical education courses are devised to develop knowledge, understanding and skills of a sport or dance activity selected by the student from a wide range of offerings.

Students in the College of Arts and Sciences may include at most four credits of 100-level courses toward the 120 credits required for the baccalaureate degree; and they may take only one 100-level physical education course each term for credit.

Medical Clearance for Participants

Students having health problems which limit their participation in physical activities must inform the Department of Physical Education of these limitations in writing, each school year before participating in any activities. Those students who are unsure as to whether or not they can safely participate in a particular program should be evaluated at the University Health Service.

Courses*

Individual and Team Sports, Self Defense, and Physical Conditioning

PEC 100 Golf/Squash

PEC 101 Paddleball/Squash

PEC 103 Squash/Tennis

PEC 104 Handball/Squash/Paddleball

PEC 106 Basic Karate

PEC 107 Intermediate Karate

PEC 109 Self Defense

PEC 113 Basic Fencing

PEC 140 Basketball/Softball

PEC 141 Volleyball/Softball

PEC 141 Volleyball/Softball

PEC 142 Soccer/Volleyball

PEC 143 Touch Football/Basketball

PEC 144 Basketball/Track and Field

PEC 145 Touch Football/Volleyball

PEC 147 Physical Conditioning

PEC 148 Weight Training

PEC 150 Archery/Badminton

PEC 151 Tennis/Badminton

PEC 152 Tennis/Volleyball

PEC 153 Golf/Badminton

PEC 154 Archery/Volleyball

PEC 155 Golf/Bowling

PEC 156 Golf/Volleyball

PEC 157 Volleyball/Badminton

PEC 158 Tennis/Archery

PEC 159 Badminton

PEC 160 Archery

PEC 164 Volleyball

PEC 165 Basketball

PEC 108 Judo

Instruction and practice of the fundamentals of judo: breakfalls, throws and grappling techniques. Limited application of

skills to competitive randori (sparring) and shiai (contest).

Fall and spring, 1 credit

N. Higashi

PEC 110 Basic Aikido (Tomiki Style)

The concept of Aikido as the spirit that carries the mind and controls the body will be studied. Aiki means making your spirit 'fit in' with your opponent's as "the principle of gentleness". Course material includes fundamentals of principle arts of attacking, bending and twisting the joints, escape and defense against multiple attacks and use of minimum strength.

Spring, 1 credit

N. Higashi

PEC 112 Bowling

A basic course in bowling including rules, scoring, and basic techniques of the game. This is an extra fee course.

Fall and spring, 1 credit

PEC 114 Intermediate Fencing

A course designed to provide the novice fencer with practice in more complex foil techniques and bout strategy, as well as to allow a more individual approach to the student's skill levels.

Spring, 1 credit

S. Krupski

PEC 161 Beginning Tennis

Complete introduction to tennis for the beginning tennis player. Introductory approach to the game of tennis involving the description and selection of racquets, utilization of various grips, development of footwork, ground strokes, sin-

*See p. 75, Information About Course Credit.

gles and doubles play. Knowledge of court areas, tennis terminology, proper tennis etiquette, rules and scoring procedures. Special emphasis on the basic fundamentals of the four major strokes: service, forehand, backhand, and volley.
Fall and spring, 1 credit

PEC 162 Intermediate Tennis

Emphasis on the development and skillful use of the four major strokes: service, forehand, backhand, and volley. Introduction to basic fundamentals of running forehand and backhand drives, approach shots, getting to the net, return of service, lob and half volley. Progressive development of those fundamentals by applying them in classes and in singles and doubles competition. Basic strategy for singles and doubles play.
Prerequisite: PEC 161.
Fall and spring, 1 credit

PEC 163 Advanced Tennis

After sufficient practical learning situations students must exhibit proficiency, while performing in tactical game situations the four major strokes of tennis: service, forehand, backhand, and volley. Progressive development of skill must be attained in those four major

strokes, such as: flat, slice-spin and twist serves, forehand and backhand, top spin and under spin and volley placement. Game strategy sessions for singles and doubles will be included. Effective use of half-volley, overhead smash, lob and drop shots will be developed.

Prerequisite: PEC 162.

Spring, 1 credit

R. Smoliak

PEC 166 Basic Cycling

A basic course in recreational cycling covering selection, use and care of bicycles, including minor repairs. Strong emphasis will be given to cycling safety and the skills of touring. Students must provide their own bicycles (minimum 5 speed).

Spring, 1 credit

J. Ramsey

PEC 168 Introduction to Yoga, (Hatha)

This activity will include instruction in various postures that are designed to enhance the physical condition of the individual through the use of breathing, relaxation and meditation techniques.

Fall and spring, 1 credit

C. Kalfur

Horsemanship

PEC 180 Beginning Horsemanship

(Formerly PEC 110)

This course is designed for the student with little or no experience in English riding and will cover basic controls and techniques employed in Hunter seat equitation. The theory program will begin the study of the environmental needs of the horse. This is an extra fee course.

Fall and spring, 1 credit

G. Lukemire

PEC 181 Advanced Beginning Horsemanship

This course is designed for the student who has acquired the basic skills in

Hunter seat equitation. Techniques will be refined and cross-country and beginning jumping will be covered. Theory will include breeds, colors, and sports. This is an extra fee course.

Prerequisite: PEC 180.

Fall and spring, 1 credit

G. Lukemire

PEC 182 Intermediate Horsemanship

(Formerly PEC 111)

A stable management course to cover the aspects of the care of the horse and the control of his environment to cover first-aid and training of the young horse.

Riding will cover sophisticated jumping techniques in the ring and in the hunt course. This is an extra fee course.

Prerequisite: PEC 181.
Fall and spring, 1 credit
G. Lukemire

Gymnastics

PEC 115 Movement Fundamentals

A basic course designed to orient students with all phases of movement. Course will include the role of exercise, weight control, balance, relaxation, locomotor skills, rhythmic skills, play skills and work skills.

Fall, 1 credit

C. Kalfur

PEC 116 Tumbling and Trampoline

Basic through intermediate tumbling and trampolining, including dual stunts, balancing and pyramid building, for men and women.

Spring, 1 credit

C. Kalfur

PEC 117 Basic Gymnastics

A basic course covering the four olympic pieces: free exercise, uneven parallel bar, horse and balance beam.

Fall and spring, 1 credit

C. Kalfur

PEC 118 Intermediate Gymnastics

An intermediate course covering the four olympic pieces, including adaptation of techniques in compositional performances.

Spring, 1 credit

C. Kalfur

Swimming and Water Safety

PEC 120 Basic Swimming

Designed to equip students at the beginner level with basic swimming skills and knowledge. (See also PEC 128.) May be repeated once for credit with approval of instructor.

Fall and spring, 1 credit

PEC 121 Intermediate Swimming

Designed to equip the deep-water swimmer with more advanced strokes and water skills.

Fall and spring, 1 credit

PEC 122 Advanced Swimming and Lifesaving

A course designed to equip the student with advanced strokes, life saving and

water safety skills.

Prerequisites: PEC 121 or equivalent and skill proficiency test.

Fall and spring, 1 credit

PEC 124 Synchronized Swimming

Synchronized swimming, individual and group techniques including routine composition and participation.

Fall and spring, 1 credit

PEC 125 Aquatic Games

Instruction and practice in water with games and recreational activities including water basketball, water polo, water volleyball, inner-tube basketball and skin diving.

Prerequisite: PEC 121 or equivalent.

Fall, 1 credit

H. vonMechow

PEC 127 Scuba Diving

A basic course covering selection, usage, and care of equipment, and basic principles of skin and scuba diving. A strong emphasis on safety in all aspects of diving. This is an extra fee course.

Prerequisites: PEC 121 or equivalent and skill proficiency test.

Fall and spring, 1 credit

PEC 128 Basic Swimming for Non-Swimmers

Basic swimming course limited to non-swimmers. (See also PEC 120.)

Fall and spring, 1 credit

PEC 129 Fundamentals of Spring Board Diving

This course is designed to teach the fundamentals of spring board diving.

Prerequisite: PEC 120 or equivalent.

Spring, 1 credit

Dance**PEC 130 Beginning Modern Dance**

A study of the fundamentals of modern dance, including an analysis of movement, conditioning and simple compositional forms.

Fall and spring, 1 credit

PEC 131 Intermediate Modern Dance

Development of modern dance techniques and movement awareness.

Prerequisite: PEC 130.

Fall and spring, 1 credit

PEC 132 Advanced Modern Dance

Modern dance techniques on an advanced level, including work in dance composition.

Prerequisite: PEC 131.

Fall and spring, 1 credit

PEC 223 Water Safety Instructor

This course is designed to help the student meet the requirements for certification as a Red Cross water safety instructor.

Prerequisites: PEC 122 or equivalent and skill proficiency test.

Fall and spring, 2 credits

H. vonMechow

PEC 226 Instructor's Course for Swimming for the Handicapped

This course is designed to help the student meet the requirements for certification as a Red Cross instructor in swimming for the handicapped.

Prerequisite: PEC 223.

Spring, 2 credits

H. vonMechow

INT 133 Dance Technique and Composition I

A study of advanced dance techniques and beginning composition. Composition problems deal with design, focus, rhythm, props, music, etc.

Fall, 3 credits

INT 134 Dance Technique and Composition II

A study of advanced techniques and the choreography of a full length dance for production.

Spring, 3 credits

PEC 135 Folk and Square Dance

This course will cover both European and American Folk Dances including American Square Dance.

Fall, 1 credit

PEC 136 Social Dance

This is a basic course covering fundamental steps in such ballroom dances as fox trot, waltz, rhumba, cha-cha, tango and lindy.

Fall and spring, 1 credit

S. Krupski. H. vonMechow

INT 233 Dance Technique and Composition III

A study of advanced dance techniques and dance composition forms. Theme development, pre-classic dance forms,

and modern dance forms are among those included.

Prerequisites: INT 133 and 134.

Fall, 3 credits

INT 234 Dance Technique and Composition IV

A study of advanced dance techniques and the choreography of a full length dance for production. The choreography must be for large groups.

Prerequisite: INT 233

Spring, 3 credits

Department of Physics

Professors: Akito Arima, Nandor L. Balazs, Martin Blume (*Part-time*), *Gerald E. Brown, *Ernest D. Courant (*Part-time*), *Max Dresden, Leonard Eisenbud, Arnold M. Feingold, Guido Finocchiaro, David B. Fossan, David Fox (*Director of Graduate Program*), *Daniel Z. Freedman, Maurice Goldhaber (*Adjunct*), Myron L. Good, Paul D. Grannis, Andrew D. Jackson, Jr., Peter B. Kahn (*Chairman*), Yi-Han Kao, Janos Kirz, Thomas T. S. Kuo, Edward D. Lambe, *Benjamin W. Lee, Linwood L. Lee, Jr., Juliet Lee-Franzini, Herbert R. Muether (*Director of Undergraduate Program*), Robert Nathans, Peter Paul, T. Alexander Pond, Henry B. Silsbee, ^aArnold A. Strassenburg (*Part-time*), Clifford E. Swartz, John S. Toll, *William I. Weisberger, Lee R. Wilcox, *Chen Ning Yang (*Einstein Professor*)

Associate Professors: Robert Lee deZafra, Roderich Engelmann, *Alfred S. Goldhaber, Erlend H. Graf, *Barry M. McCoy, Robert L. McGrath, Harold J. Metcalf, Richard A. Mould, *Hwa-Tung Nieh, *John Smith, Gene D. Sprouse

Assistant Professors: Philip B. Allen, Hans Jostlein, James E. Lukens, Robert L. McCarthy, Lester Paldy, Nigel J. Shevchik, *Peter van Nieuwenhuizen

A student wishing to major in physics may elect either the research program, the general program or an appropriate combination of the

^aOn leave.

*Member of Institute for Theoretical Physics

two. The *research program* is designed to serve either as a preparation for graduate study in physics or as a terminal program in preparation for employment in industry or research. While it is substantial preparation for teaching in physics at the secondary level, the more usual route to such certification is the general program.

The *general program* in physics is designed for students who wish to acquire considerable knowledge of the subject, but who do not intend to go on to a research-oriented career in physics. This program may be useful to pre-medical students, prospective secondary school science teachers and many others interested in science. This latter group might include students who will someday work in the areas of science teaching, administration relating to science or technology, the history of science, technical writing, patent law, science and public policy, etc.

An astrophysics-physics program is offered jointly with the Department of Earth and Space Sciences.

Minimum Requirements for the B.S. in Physics

1. Ten courses in the department, six of which must be at the junior level or above. Of these six, at least two semesters must be laboratory courses and must include PHY 322, PHY 345, or PHY 346.

2. Four semesters of mathematics: MSM 121, 122, MSM 151, 152 or MSM 191-194 (honors calculus sequence).

3. Twelve credits of other science, mathematics or science-related courses (e.g., History of Science, Science and Public Policy) chosen with the approval of the departmental advisor. PHY 233 and PHY 239 may be included.

Students wishing to major in physics must, at the end of their sophomore year, consult with their departmental advisors in order to draw up preliminary plans of study which will then be submitted to the department. The plan can be revised at any time with the advisor's approval.

Honors

To receive the Bachelor of Science in physics with honors, a student must take ten courses in the department at the junior level or above, receiving an overall grade point average in these courses of at least 3.3. Two of the ten courses must be chosen from among the following: PHY 345, 346 Senior Laboratory and PHY 391, 392 Research.

The Research Program

A student electing the research track in physics has considerable flexibility in the choice of courses. The following sample program is suggested.

Freshman Year

PHY 101 General Physics I
PHY 102 General Physics II
MSM 121 or 191 Calculus I or Honors Calculus I
MSM 122 or 192 Calculus II or Honors Calculus II
CHE 101 or 103 General Chemistry or Honors Chemistry
CHE 105 or 109 General Chemistry Laboratory or Honors Chemistry Laboratory
CHE 102 or 104 General Chemistry or Honors Chemistry
CHE 106 or 110 General Chemistry Laboratory or Honors Chemistry Laboratory

Note: Chemistry may be taken equally well in the sophomore year.

Sophomore Year

PHY 151 General Physics II
PHY 154 Optics and Waves
PHY 208 Quantum Physics
MSM 151 or 193 Calculus III or Honors Calculus III
MSM 152 or 194 Calculus IV or Honors Calculus IV

Junior Year

PHY 201, 202 Electromagnetic Theory
PHY 205 Mechanics
PHY 206 Thermodynamics, Kinetic Theory, Statistical Mechanics
At least one semester of PHY 235, 236 Junior Laboratory
MSI 201 Advanced Calculus for Scientists I
MSI 202 Advanced Calculus for Scientists II

Senior Year

PHY 343 Methods of Mathematical Physics I
PHY 345 Senior Laboratory I

Three selections from courses listed below:

PHY 305 Advanced Quantum Physics
PHY 331 Nuclear and Particle Physics
PHY 336 Topics in Electrodynamics
PHY 344 Methods of Mathematical Physics II
PHY 346 Senior Laboratory II
PHY 372 Solid State Physics
PHY 391, 392 Research
PHY 393, 394 Tutorial in Advanced Topics

The General Program

A student electing this track is free to choose from many possible courses depending on his or her interests and goals. The following

sample program is suggested. Other choices are acceptable with the advisor's approval.

PHY 131, 132 Introductory Physics

PHY 141 Introduction to Quantum Physics and Relativity

PHY 142 Topics in Classical Physics I

MSM 121, 122 and 151, 152 Calculus, or MSM 191-194 Honors Calculus

PHY 241 Topics in Particle and Quantum Physics

PHY 242 Topics in Classical Physics II

PHY 301, 302 Contemporary Physics from an Elementary Viewpoint

PHY 321, 322 Advanced Laboratory

PHY 361, 362 Senior Seminar

The Astrophysics Program

A student electing the astrophysics track would take a program of study which satisfies the minimum requirements for a B.S. in physics. In addition, he or she would take a concentration in those courses offered by the Earth and Space Sciences or Physics Department which satisfies his or her educational goals.

Certification for Secondary-Level Teaching

State certification as a high school teacher of physics requires 36 credits of science courses, including at least 15 credits in physics. The *general program* outlined above provides more than these minimum requirements. In addition, 12 credits in the professional study of education are also required. PHY 239 Materials and Methods in Teaching Physics may be counted toward these 12 credits and is strongly recommended to all prospective high school and two-year college physics teachers. With six credits in mathematics in addition to those required for the major in physics, it is possible to obtain dual certification in physics and mathematics. Dual certification in physics and earth sciences or in physics and chemistry is also feasible within the boundaries of the *general program*.

In order to obtain the recommendation of the Department of Physics for admission to student-teaching, a student must have completed PHY 239 with a grade of C or above, have earned at least a 2.0 grade point average in all physics and mathematics courses completed, and have an overall cumulative grade point average of at least 2.0.

Courses*

The courses General Physics I-III present an intensive introduction to classical and modern physics for those who may major in physics, some other physical science or engineering.

PHY 101, 102 General Physics I, II

An introductory survey of classical physics, in which calculus is used concurrently with its development in MSM 121, 122. Mechanics, wave motion, kinetic theory and thermodynamics are discussed during the first semester; electromagnetism, electric circuit theory, and optics during the second. Three lectures, one recitation and two laboratory hours per week.

Corequisites: MSM 121, 122.

Fall and spring, 4 credits each semester

PHY 103, 104 Physics for the Life Sciences

Primarily for students majoring in Biological Sciences or in pre-clinical programs. A general introduction to physics, with applications to biological systems. Topics include mechanics, fluid mechanics, electro magnetism, optics, acoustics, and radiation phenomena. Three lectures, one recitation, and two laboratory hours per week.

Prerequisites: MSM 121, CHE 101, 102 or 103, 104 or equivalent.

Fall and spring, 4 credits each semester

PHY 110 Energy Resources and the Environment

An investigation of the role of energy in our civilization showing interaction of pure science, applied science and technology and their impact on the environment and everyday life. Discussion centers on current status of energy resources and physical principles of energy conversion. These principles are illustrated by examining some present (e.g., fission reactors) and future (e.g., magneto-hydrodynamic generators) energy conversion systems. The environmental impact of the present rate of energy consumption of our society is discussed. The course is intended for both non-science

and science majors. It may not be counted as one of the ten departmental courses required for the B.S. degree program in physics.

Fall and spring, 3 credits

PHY 117 Physics and Biological Systems

This course consists of an introductory survey of physics with emphasis on applications to biological systems. Topics studied will include the mechanics of particles; solids and fluids; thermodynamics; optics; electricity, magnetism and radiation phenomena. Familiarity with algebra and trigonometry is required. This course is designed to satisfy the physics requirements for students in the nurses' training and allied health programs. It is a one semester course in elementary physics and the applications of physics to the health sciences. The laboratory program introduces elementary experimental techniques and provides an opportunity for observation of phenomena on which the theory is built. Three class hours and one three-hour laboratory period per week.

Fall, 4 credits

PHY 121 An Approach to Physical Science

Designed particularly for non-science majors, this laboratory and discussion-oriented course provides an opportunity for students to proceed from simple investigations to the formulation of powerful conceptual models. Stress is placed upon *how* rather than *what* we know. Problems and laboratory work can be completed successfully by students with no previous knowledge of college mathematics. One lecture, two discussion periods and one two-hour laboratory period each week.

Fall and spring, 4 credits

*See p. 75, Information About Course Credit.

PHY 131, 132 Introductory Physics

An introductory survey of standard physics topics, arranged for individualized study. Topics in mechanics, including kinematics, Newton's laws, and energy, are followed by thermodynamics during the first semester. The second semester includes wave motion, optics, electromagnetism, and atomic physics. The pace of study, the level of sophistication, and the emphasis among the topics are all determined by student background, professional intentions and individual progress. Each individual assignment includes both theoretical and experimental work. Proficiency in one unit must be demonstrated before the student proceeds to the next.

Fall and spring, 4 credits each semester

PHY 137, 138 The Nature and Use of Physical Science

A non-mathematical course about physics to provide some broad scientific background for the educated citizen in an increasingly technological society. The course will be given as a sequence of six relatively independent modules, three per semester. The modules will be devoted to:

1. space, time and symmetry
2. communication, control, information, computers
3. waves, sound, music, noise
4. light, color, vision
5. frontiers of modern physics, research at Stony Brook
6. science and society, applications of technology

A student receives three credits for PHY 137 after successful completion of any three of these modules. Each additional module successfully completed during the academic year earns one credit for PHY 138. Questions on how to register for these courses should be addressed to the director of the undergraduate program in physics.

Fall and spring PHY 137, 3 credits; PHY 138, 1, 2, or 3 credits

PHY 141 Introduction to Quantum Physics and Relativity

Primarily for students in the general program. Departures from the classical

physics of the last century. Special relativity, kinetic theory, thermal radiation, the particle aspect of electromagnetic radiation, the wave aspects of material particles, the Heisenberg uncertainty principle, Rutherford scattering and the Bohr model of one-electron atoms. Three class meetings and one three-hour laboratory per week.

Prerequisites: PHY 101, 102, or PHY 131, 132 and MSM 121, 122.

Fall, 4 credits

PHY 142 Topics in Classical Physics I

Primarily for students in the general program. Electric and magnetic fields and their connection with special relativity, electric and magnetic fields in matter, electromagnetism and Maxwell's equations in integral form, oscillatory motion, wave motion, geometrical and physical optics. Three class meetings and one three-hour laboratory per week.

Prerequisite: PHY 141.

Spring, 4 credits

PHY 151 General Physics III

This course is principally an introduction to particle and quantum physics. Topics studied will include special relativity, the particle aspects of electromagnetic radiation, the wave aspects of material particles, the concept of a wave function and other fundamentals of the quantum theory. These ideas will be discussed as they relate to atomic spectra and structure, nuclear structure, elementary particles and aspects of molecular and solid state physics. Three lecture hours and one three-hour laboratory per week.

Prerequisites: PHY 101, 102.

Corequisite: MSM 151.

Fall and spring, 4 credits

PHY 154 Optics and Waves

A survey of geometrical and physical optics. The basic phenomena of optics—ray optics, interference, diffraction and polarization—will be observed and discussed in terms of the wave theory of light. Applications will be made to the design and performance of optical instruments and systems using crystal

optics, lasers and holography. Three class hours and one three-hour laboratory per week.

Prerequisites: PHY 101, 102.

Corequisite: MSM 151.

Fall and spring, 4 credits

PHY 201, 202 Electromagnetic Theory

Review of elementary electromagnetic phenomena and their unification in Maxwell's equations. Applications of the theory to static and changing electric and magnetic fields, interaction of the fields with bulk matter, circuit theory, interaction of charged particles with electromagnetic fields, propagation of electromagnetic waves, and radiation. Three class hours per week.

Prerequisites: PHY 151, PHY 154 and MSM 152.

Corequisites: MSI 201, 202

Fall and spring, 3 credits each semester

PHY 205 Mechanics

The Newtonian formulation of classical mechanics is reviewed and applied to more advanced problems than those considered in PHY 101, 102. The Lagrangian and Hamiltonian methods are then derived from the Newtonian treatment and applied to various problems.

Corequisite: MSI 201.

Fall and spring, 3 credits

PHY 206 Thermodynamics, Kinetic Theory and Statistical Mechanics

The course is in two parts. Those relations among the properties of systems at thermal equilibrium, which are independent of a detailed microscopic understanding, are developed by use of the first and second laws. The concept of temperature is carefully developed. The thermodynamic potentials are introduced. Applications to a wide variety of systems are made. The second portion of the course, beginning with the kinetic theory of gases, develops elementary statistical mechanics, relates entropy and probability and treats simple examples in classical and quantum statistics. Three class hours per week.

Prerequisites: PHY 151 and MSM 151.

Fall and spring, 3 credits

PHY 208 Quantum Physics

An introduction to the concepts and mathematical methods of quantum mechanics. Some stress will be placed on historical development. Topics will include early quantum theory, Schrodinger's equation in time dependent and time independent forms, one and three dimensional solutions including the treatment of angular momentum and spin and perturbation theory. Applications to simple systems, especially the hydrogen atom, will be stressed. Three class hours per week.

Prerequisite: PHY 151.

Fall and spring, 3 credits

PHY 233 Physical Principles Applied to Living Systems

Topics will include the special sensory systems (vision and hearing) from the physical, neural, molecular and psychophysical viewpoints; the operation of the nervous system as both a communications network and a biochemical phenomenon; the effects of electromagnetic radiation at ionizing and non-ionizing energies, as well as the effects of mechanical radiation (ultrasound); the structural system and the functions of muscles with accent on the heart muscle; and a detailed treatment of several types of modern instrument systems used in biological research. This course may not be counted as one of the ten departmental courses required for the degree.

Prerequisites: PHY 101, 102, or PHY 103, 104 or PHY 131, 132.

Spring, 3 credits

PHY 235, 236 Junior Laboratory I, II

This course aims at providing a thorough introduction to modern electronics. It begins with a review of D.C. and A.C. circuits, diode and FET characteristics. This is followed by a study of the transistor in both the linear and saturation region. The differential amplifier, because of its fundamental importance in present day electronics, will be studied in detail. The concepts of negative and positive feedback will be introduced and demonstrated. The circuits used in digital computers (elementary logic circuits, storage registers, shift registers, adders) will be

studied also.

Fall and spring, 3 credits each semester

PHY 239 Materials and Methods in Teaching Physics

Designed for prospective teachers of physics in secondary schools and two-year colleges, the course emphasizes methods and materials appropriate to the teaching of introductory physics and stresses recent curriculum developments. Students are required to become familiar with texts, laboratory materials and other teaching aids, and are given the opportunity to demonstrate their proficiency in peer teaching situations. Three class hours per week. This course may not be counted as one of the ten departmental courses required for the degree. Prerequisites: PHY 141, 142 or equivalent.

Fall, 3 credits

PHY 241 Selected Topics in Particle and Quantum Physics

Primarily for students in the *general program*. An introduction to wave mechanics and its application to various physical systems. The Schrodinger equation, atomic structure and spectra, radioactivity, nuclear structure, introduction to the theory of solids, elementary particles and quantum statistics. Three class hours per week.

Prerequisites: PHY 142, MSM 151, 152.

Fall, 3 credits

PHY 242 Selected Topics in Classical Physics II

Primarily for students in the *general program*. A further development of selected subjects in classical physics, including Maxwell's equations, propagation of electromagnetic waves in vacuum and in matter, central forces and gravitational potential, dynamics of rigid bodies, rotating coordinate systems, fluid mechanics and thermodynamics. Three class hours per week.

Prerequisites: PHY 142, MSM 151, 152.

Spring, 3 credits

PHY 295 Undergraduate Teaching Practicum

This course will provide selected undergraduates with an opportunity to collaborate with the faculty in teaching at the introductory level. In addition to working as tutors and as laboratory assistants, students will meet once a week with a faculty supervisor to discuss problems that have been encountered and to plan future activities. Students will generally be assigned to assist in courses they have completed and in which they have excelled. Not for major credit and not repeatable; students may offer only one teaching practicum for credit. Grading in this course shall be Satisfactory/Unsatisfactory only.

Prerequisites: Junior or senior standing, PHY 101, 102 or PHY 103, 104 or PHY 131, 132, interview, and permission of director of undergraduate program in physics.

Fall and spring, 2 credits each semester

PHY 301, 302 Contemporary Physics from an Elementary Viewpoint

The basic purpose of this course is to provide a qualitative understanding of the ideas, methods and experimentation of contemporary physics. Extensive use will be made of dimensional arguments, order of magnitude estimates and pictorial descriptions. The subjects to be discussed will be chosen from superconductivity, masers, Mossbauer effect, strong and weak interactions, quasars and other topics in astrophysics. This course is intended primarily for students in the *general program*.

Prerequisites: MSM 152, PHY 151, or 242..

Fall and spring, 3 credit each semester

PHY 305 Advanced Quantum Physics

This course offers further development and extension of the principles introduced in PHY 208. Topics will include the quantum mechanical description of identical particles, symmetry principles, the structure of multi-electron atoms, the application of perturbation theory to radiative transitions, external perturbations (Zeeman and Stark splitting), an introduction to the matrix formulation of

quantum theory and the quantum mechanical description of scattering. Three class hours per week.

Prerequisite: PHY 205, 208, and MSI 201.

Fall and spring, 3 credits

PHY 307 Physics of Continuous Media

Topics to be covered include the response of non-ideal solids to stress, the properties of compressible fluids, viscosity, momentum transfer in fluid motion, irrotational flow, wave motion in gases, acoustics, conducting fluids, magneto-hydrodynamics waves, the physics of fully ionized gases, dynamics of degenerate fluids, application to magnetic plasmas, etc. This course is of interest to, among others, potential astrophysicists, plasma physicists, low temperature physicists and geophysicists.

Prerequisites: PHY 205, 206.

Fall, 3 credits

PHY 321, 322 Advanced Laboratory

Primarily for those in the *general program*. The experiments will be selected from among those presently performed in PHY 235, 236 Junior Laboratory and PHY 345, 346 Senior Laboratory. The emphasis during the first semester will be on electrical measurements including electronics. Experiments for the second semester will involve work in atomic, nuclear and solid state physics. Two three-hour laboratory sessions per week.

Fall and spring, 3 credits each semester

PHY 331 Nuclear and Particle Physics

Primarily for majors in physics. The topics will include: the interaction of radiation with matter, radiation detectors, nuclear structure, nuclear reactions, nuclear forces, accelerators, the properties of elementary particles and resonances. Applications of quantum mechanics and the role of symmetry principles will be stressed. Three class hours per week.

Prerequisite: PHY 208.

Fall, 3 credits

PHY 336 Topics in Electrodynamics

Subjects to be studied include multipole fields, solutions of Laplace's equation,

electromagnetic waves in free space and in cavities, the fields of moving charges, radiation and radiating systems, classical electron theory, spherical waves and relativistic electrodynamics. Three class hours per week.

Prerequisites: PHY 201, 202, MSI 201.

Fall and spring, 3 credits

PHY 343, 344 Methods of Mathematical Physics I, II

This course describes a selection of mathematical techniques useful for advanced work in physics. The methods will be illustrated by applications in mechanics, hydrodynamics, heat conduction, electromagnetic theory and quantum mechanics. Topics will be selected from the following: linear vector spaces; tensor algebra and vector analysis; matrices, Green's functions; complex variables with application to conformal mapping and contour integration; eigenvalue problems and orthogonal functions, partial differential equations; calculus of variations; integral transforms; integral equations; special functions, generalized function theory; probability. Three class hours per week.

Prerequisites: PHY 201, 202, 205, and MSI 201, 202.

Fall and spring, 3 credits each semester

PHY 345, 346 Senior Laboratory I, II

Primarily for majors in physics. A number of historically important experiments are studied and performed with the aid of modern instrumentation. As they progress, students are encouraged to pursue independent projects in which there are no rigidly fixed formats or procedures. Primary emphasis is on the development of experimental skills and on professionally acceptable analysis and presentation of results, both in written and oral form. Projects are typically chosen from such fields as atomic and nuclear spectroscopy, electron physics, solid state and low temperature physics, optics and electromagnetism. Two three-hour laboratory sessions per week.

Prerequisite: PHY 208.

Fall and spring, 3 credits each semester

PHY 361, 362 Senior Seminar

During the first semester, each student will select two fairly short and simple papers for presentation before the class. Assignments for individuals not presenting papers will include written critiques based on criteria which must be developed by the class. In the second semester each student will deliver a colloquium talk on some creative project of his/her own. These talks may either be verbal presentations of written materials prepared to explicate a physical theory or experiment, or lecture demonstrations using equipment which the student developed. Two class meetings per week. Prerequisites: PHY 241, 242.

Fall and spring, 2 credit each semester

PHY 372 Solid State Physics

Introduction to the principal types of solids, with emphasis on their electrical and magnetic properties and elementary theory of electrons in metals, energy bands. Applications to semi-conductors, superconductors, para- and ferromagnetism, magnetic resonance. Three class hours per week.

Prerequisites: PHY 201, 202, 206, and 208.

Spring, 3 credits

PHY 391, 392 Research

With the approval of the faculty, a stu-

dent may conduct research for academic credit. Research proposals must be prepared by the student and submitted for approval by the faculty before the beginning of the credit period. The work is performed under the supervision of a member of the faculty. An account of the work and the results achieved is submitted to the faculty before the end of the credit period. May be repeated.

Prerequisite: Permission of the director of the undergraduate program in physics.

Fall and spring, 2 to 4 credits each semester at discretion of instructor.

PHY 393, 394 Tutorial in Advanced Topics

For upper division students of unusual ability and substantial accomplishments, reading courses in advanced topics may be arranged. Prior to the beginning of the semester, the topic to be studied is selected by the supervising member of the faculty and a reading assignment is planned. Weekly conferences with this member of the faculty are devoted to discussion of material, resolution of problems encountered and assessment of the student's progress. May be repeated.

Prerequisite: Permission of the director of the undergraduate program in physics.

Fall and spring, 2 to 4 credits each semester at discretion of instructor.

Graduate Courses

Qualified seniors may take 500-level courses with the permission of the department chairman. See *Graduate Bulletin* for details.

Quantum Mechanics
Statistical Mechanics
Nuclear Physics
Classical Physics

Astrophysics
Solid State Physics
Elementary Particle Physics

Department of Political Science

Professors: Yassin El-Ayouty (*Part-time*), Lee E. Koppelman (*Part-time*), Arthur Kunz (*Part-time*), Pertti Pesonen, Howard A. Scarrow, Joseph Tanenhaus, Martin B. Travis, Bernard Tursky, Rudolf Wildenmann, Jay C. Williams (*Chairman*)

Associate Professors: Alex Ames (*Part-time*), Milton G. Lodge, Edward N. Muller, Frank E. Myers

Assistant Professors: Bernard N. Grofman, Thomas Jukam, Mark Landis, Kristen R. Monroe, Jonathan Pool, Mark Schneider

Instructor: Charles Whitmore

Lecturers: Richard Reeder, Doris Gonzalez-Stratmann

Requirements for the Major in Political Science

In addition to the general University requirements for the Bachelor of Arts degree, the following courses are required for the major in political science:

	<i>Credits</i>
1. Study within the area of the major	
A. <i>Three out of four of the following courses:</i>	9
POL 120 World Politics	
POL 140 American Government	
POL 151 Comparative Politics	
POL 191 Political Behavior	
B. <i>Political Science electives</i>	24
1) all must be selected from courses numbered 200 or above;	
2) 12 credits must be concentrated in one of the programs of study listed below;	
3) no more than six of the twenty-four 200 level political science credits may be taken at another institution (exceptions made in the case of planned foreign study).	
2. Two courses offered by another department in subjects related to the chosen sequence, as approved by a departmental advisor to the sequence.	6
	<hr/>
<i>Total</i>	39
	257

Programs of Study

International Relations

Four of the following:

POL 219, 221, 222, 224, 225, 228, 391, 392.

Comparative Politics

Four of the following:

POL 206, 207, 209, 210, 211, 213, 220, 234, 391, 392.

Law

Four of the following:

POL 224, 229, 230, 232, 252, 391, 392.

Public Policy

At least one course in each of the following sub-fields:

Specific Policy areas—

POL 248, 251, 254, 274.

How Policy is Made—

POL 250, 252, 257, 264, 268.

Levels of Government—

POL 243, 244, 245, 246, 247.

American Politics

At least one course in each of the following sub-fields:

Subnational Politics—

POL 244, 246, 249.

Institutions of American Government—

POL 221, 230, 242, 250, 252, 255.

American Policy Processes—

POL 251, 254, 256, 257, 264, 268, 274, 391, 392.

Pi Sigma Alpha

To qualify for the national honor society in Political Science, a student must have junior standing, an overall average of 3.0 and at least 15 credits at the 200 level or above from Stony Brook in Political Science and a 3.5 in these courses.

Courses*

POL 110 Power

Recent political rhetoric has increasingly emphasized the problem of power. "Black power," "student power," the arrogance of power," and other expressions are used to talk about who has power and who ought to have it, about how it is wielded and how it should be wielded. A number of political scientists have also treated "power" as the most important concept in their field of study. This course will critically discuss and evaluate the uses of the notion of "power" in both scholarly literature and the debates of contemporary politics.

3 credits

J. Pool

POL 120 World Politics

This course will analyze the basic concepts and issues of international relations in the contemporary international system. The behaviors of states and their decision makers will be considered according to various models of national and international conflict. The relationship between the characteristics of nations and their foreign policies will be studied on a comparative basis. Especially recommended for majors.

3 credits

POL 140 Introduction to American Government

This course will cover what the informed citizen and specialist should know about the organization of American government, including the Constitution and what it means today; the Congress, political parties, pressure groups, growth of the Presidency, the Supreme Court, judicial review, federalism, separation of powers, the Bill of Rights. Especially recommended for majors.

Fall and spring, 3 credits

M. Landis, M. Schneider

POL 151 Introduction to Comparative Politics

Analysis of political institutions and processes in the contemporary world. This course will emphasize the interaction of political structures and processes in a variety of political settings. Especially recommended for majors.

Fall and spring, 3 credits

K. Monroe, H. Scarrow, F. Myers

POL 191 Political Behavior

Survey of the types, modes, and conditions of political activity (political participation, apathy, alienation); political census and cleavages (aggression, violence, war); political socialization and recruitment of political elites; psychological and social basis of uniformities and variations in political behavior. Especially recommended for majors.

Fall and spring, 3 credits

M. Lodge, B. Tursky

POL 192 Interpreting Political Survey Results

This course is designed to introduce students to the logic and methods of public opinion research. Focusing primarily on political survey results, topics covered will include: the formulation and testing of hypotheses; the analysis and interpreting of tables, figures, and graphs; the interpretation of simple, descriptive statistics; and the review of major contemporary studies of American public opinion.

Prerequisite or corequisite: POL 191.

Fall and spring, 3 credits

M. Lodge

POL 200 Political Analysis

The major purpose of this course is to introduce the student to the nature of social science inquiry. Subjects covered will include the structure of scientific knowledge, concept formation and strategies of theory construction and confirmation. Especially recommended for

*See p. 75, Information About Course Credit.

students considering advanced work in any of the social sciences.

Prerequisite: POL 191.

3 credits

POL 202 Problems of Marxism

The problems posed for Marxism by certain competing schools of political thought, by institutional and social developments in the west, in Russia and in backward areas, and by deviationist tendencies as in China and Yugoslavia. Particular attention will be given to the problems posed for social organization by (1) technology and its demands, (2) the ideal of high mass consumption, (3) the concept of individual development. Responses given to those problems by Marxism, Leninism, Mill, Weber and Dewey will be surveyed. The course will relate doctrines to institutions.

Prerequisite: At least sophomore standing.

3 credits

J. Williams

POL 203 Politics of Women's Rights

Considers the contemporary political movements, here and abroad, for the equalization of women's rights and status. Analyzes the evidence and arguments concerning the status of women in the educational, economic and social areas, and the legal, constitutional, and traditional grounds for differences in masculine and feminine roles. Looks at the tactics and achievements of the movements.

Prerequisite: At least sophomore standing.

3 credits

D. Gonzalez Stratmann

POL 205 Political History of East Africa

A general survey of the cultural and political history of East Africa, emphasizing Tanzanian, Ugandan and Kenyan experiences. This course is identical with AFS 240.

Prerequisite: Two semesters of introductory AFS courses.

Fall, 3 credits

E. Wasswas

POL 206 Political Elites

This course will analyze the roles and composition of elite groups in a variety of political settings. The aim of the course is both to describe the predominant characteristics of such elites and to develop a theory of elite-mass relationships.

Prerequisite: POL 151.

Spring, 3 credits

POL 207 Language and Politics

Several countries have had their stability or existence threatened by conflicts among language groups. Some governments have attempted to reform drastically their peoples' languages. Social, racial and occupational dialects function as mobility barriers and rhetoric makes language a tool for political persuasion and control. Language differences make cross-national political analysis problematic. Explanations for these phenomena will be sought by asking: (a) What can one learn about politics from language? (b) What can one do about language through politics?

Prerequisite: POL 151.

3 credits

J. Pool

POL 209 Politics in Developing Areas

Survey of developmental politics in selected emerging nations. Emphasis upon colonial policies prior to independence, nationalistic movements, constitution building and the emergence of leadership, parties and interest groups. Comparison of the western and non-western political process.

Prerequisite: POL 151.

3 credits

POL 210 Politics in Africa

A study of nationalism, political thought and political institutions in Africa. Consideration is given to the question for unity, the problems of liberation and the political implications of social change. This course is identical with AFS 258.

Prerequisites: Two courses in the social sciences or sophomore standing.

Fall and spring, 3 credits

C. Parris

POL 211 Comparative Political Parties and Pressure Groups

An analysis of the nature and function of political parties and pressure groups, with emphasis upon non-American political systems, both western and non-western, and upon party history, electoral behavior, election campaigns and pressure group activity. Analysis of cross-national public opinion survey data using card sorter.

Prerequisite: POL 151.

3 credits

POL 212 The Political Film: Art and Ideology

The study of certain aspects of political behavior through the close analysis of political movies. The course examines the relation of belief to political behavior as well as the way in which a meaning is conveyed in different styles of movies.

Prerequisite: Sophomore standing.

3 credits

J. Williams

POL 213 British Parliamentary Democracy

Examination of the working of parliamentary democracy in Britain and in selected dominions with emphasis upon the nature of the societies in question and the relationship of society to the working of political institutions, ideologies and governmental policies.

Prerequisite: POL 151.

3 credits

F. Myers, H. Scarrow

POL 219 Foreign Policy in the Middle East

The course will survey problems involved in the formulation of foreign policy of selected Middle East countries including Israel and Egypt. Cultural, economic, psychological, as well as political components of policy making will be examined together with the role of legislative and executive institutions.

Prerequisite: POL 120.

3 credits

M. Travis

POL 220 Government and Politics in Puerto Rico

An analysis and study of the governmental structure and political institutions of Puerto Rico. This course is identical with PRS 220.

Prerequisite: POL 151.

3 credits

D. Gonzalez-Stratmann

POL 221 American Foreign Policy

Survey of problems involved in formulation of United States foreign policy. Whenever appropriate the American system is compared with procedures in other countries. Components of policy are analyzed: conditions abroad, traditional policy, public opinion, international law. Major constitutional provisions as they relate to foreign policy are reviewed. Executive and legislative institutions are studied from standpoints of role and personality with emphasis given to contemporary situations.

Prerequisite: POL 120.

3 credits

T. Jukam, M. Travis

POL 222 International Organization

The course will cover a survey of alternative forms of political organization, their conditions and problems; historical precedents of international organization; the experience of the League of Nations; the United Nations and some of the more important specialized agencies; proposals for reforming the U.N. and possible future developments.

Prerequisite: POL 120.

3 credits

POL 223 The Politics of Conflict: The Middle East

The emergence of Zionism and the collision between Arab and Jewish nationalisms in the Middle East. Analysis of the issues leading to and resulting from several Arab-Israeli wars and confrontations. Study of the role of outside powers and organizations, including the United Nations, in both conflict and conciliation and prospects of the future.

Prerequisite: POL 120.

3 credits

Y. El-Ayouty

POL 224 Introduction to International Law

Case book approach to standard introductory course in international law, including the following topics: state jurisdiction and responsibility, individuals, international organization, use of force.

Prerequisite: POL 120.

3 credits

M. Travis

POL 225 Problems of International Relations

Analysis of the international system, its characteristic forms and the principal forces making for conflict and adjustment. Examination of some prevalent analytical concepts, of major current problems and developments, and of prospects and alternatives for the future.

Prerequisite: POL 120.

3 credits

T. Jukam, M. Travis

POL 228 American Defense Policy

Historical and political investigation of salient trends in American military and national security policy since World War II, with special attention to domestic political groups and forces which influence defense policy making. Models of the political process in foreign and defense policy making are contrasted in terms of available evidence.

Prerequisite: POL 120.

POL 229 Law and Politics

This course will deal with the major institutional structures of the civil and criminal law systems in the United States: the adversary proceeding, the legal profession, the judiciary, juries and patterns of fault and punishment. Each aspect will be placed in the setting of American politics, i.e., in the context of legislative, executive, party and community behavior.

Prerequisite: POL 140.

Fall, 3 credits

POL 230 Constitutional Law and Politics: United States

A study of the role of the modern Su-

preme Court within the political and governmental process; its relation with Congress, the Presidency, state and local governments, parties and interest groups; and the Court's contemporary policy-making role in several areas—economic regulation, representation, race relations, censorship, religion in government, defendants' rights.

Prerequisite: POL 140.

Fall and spring, 3 credits

J. Tanenhaus

POL 232 Constitutional Law and Politics: Comparative

The role of courts, lawyers, judges and interest groups in the American and selected foreign political systems.

Prerequisite: POL 230.

3 credits

J. Tanenhaus

POL 233 Political Culture and Socialization

Discussion of principal concepts, methods, and findings in the related fields of political culture and political socialization with emphasis on the American political system. Substantive focus on: (1) how individuals are indoctrinated into the political culture via agents of socialization such as family, school, and mass media; (2) how the political culture influences support and opposition to the political authorities, regime, and community.

Prerequisite: POL 191.

3 credits

E. Muller

POL 234 Comparative Analysis of National, State and Local Political Systems

The concepts and techniques associated with the comparative analysis of political systems, both at the cross-national level and the level of cross-subunit comparison. Examples are drawn from representative writings.

Prerequisite: POL 151.

3 credits

H. Scarrow

POL 239 Political Propaganda

Examination of devices used to manipulate political attitudes and beliefs in both print and visual media. Course topics include politics of the mass media, political satire, political rhetoric, psychology of persuasion, etc.

Prerequisite: POL 191.

3 credits

B. Grofman

POL 240 The Politics of Race

An analysis of the role which race plays in national policy formulation in the United States. The following topics will be examined: the institutionalization of racism in the American political culture; how blacks perceive political reality; elitism and pluralism; non-violence; patriotism and black nationalism; black politics and black power; the response of government to the demands of blacks; new political forms; future directions in black-white relations. This course is identical with AFS 255.

Prerequisites: Two previous courses in the social sciences or sophomore standing.

Spring, 3 credits

C. Parris

POL 241 Political Attitudes

A treatment of the problems of public opinion and factors creating it. The course investigates: (1) the content and style of expressions of political attitudes; (2) the other political determinants of interest and participation levels and political loyalties; (3) attitude research methods.

Prerequisite: POL 191.

3 credits

T. Jukam, J. Pool

POL 242 American Political Parties and Pressure Groups

This course examines: (1) political party organization, political leadership, finance, campaign techniques and legal controls over parties; (2) the functions and methods of pressure groups and their interaction with policy makers; (3) the historical origins and development of the American party system; (4) the signifi-

cance of parties and pressure groups for democratic ideology and the problems of political leadership in a democracy.

Prerequisite: POL 140.

3 credits

M. Landis

POL 243 Politics of New York State

Analysis of parties, pressure groups and the political process in New York State. Particular attention paid to the legislative process in Albany.

Prerequisite: POL 140.

3 credits

H. Scarrow

POL 244 State and Local Government

Analysis of subnational units, including states, cities, towns and counties in urban and suburban settings. Relationship of these to citizens and other government units.

Prerequisite: POL 140.

3 credits

POL 245 The Politics of Community Action

Demands for "community control," "decentralization" and "participation of the poor" have been prominent in the community politics of recent years. The course examines the theoretical and practical implications of these concepts within the general framework of political participation and their impact on local political institutions. Among the specific areas studied are health, housing, welfare, police and anti-poverty programs.

Prerequisite: POL 140.

3 credits

D. Gonzalez-Stratmann

POL 246 Urban Politics

Emphasizes both the formal and informal political institutions and processes in American cities, including governmental structures, political parties, interest groups and service systems. Special attention will be given to community "power structures," political participation and a comparative approach to the study of urban politics.

Prerequisite: POL 140.

3 credits

POL 247 Government and Administration of New York City

Analysis of government institutions and processes in New York City. City-state relations; Office of the Mayor; Board of Estimate; City Council; civil service; taxation and budgeting; selected policy problems, including problems of the metropolitan region.

Prerequisite: POL 140.

3 credits

POL 248 Politics of Poverty and Welfare

Consideration of the governmental policy-making process in welfare; poverty and welfare as problems for governmental action and public policy; poverty as a phenomenon for political analysis; national, state and local programs to deal with poverty (particularly welfare programs); political behavior which results from poverty and the current welfare system.

Prerequisite: POL 140.

3 credits

POL 249 American Federalism and Intergovernmental Regulations

A survey of the constitutional, institutional and political interrelationships among federal, state and local governments; covering grant-in-aid and interstate compacts.

Prerequisite: POL 140.

3 credits

L. Koppelman

POL 250 Bureaucracy and Public Administration

Intended for students interested in a public service career. Functions of bureaucracy in American society and in various cultural contexts. Relationships between policy and administration; development of organizational and bureaucratic theories with emphasis on decision making, innovation and responsibility.

Prerequisite: POL 140.

3 credits

POL 251 Policy and Administration of Natural Resources

Policy development in the resources area as influenced by the structure and pattern of political power on international, national, state and local levels of government. The significance of technological innovation, value orientations and economic welfare analysis in giving direction to policy planning.

Prerequisite: POL 140.

3 credits

L. Koppelman

POL 252 The Legislative Process

An examination of American legislative institutions—Congress, state governments, local legislatures—in light of recent research. How legislatures actually operate and how American legislatures contribute to the "democratic culture."

Prerequisite: POL 140.

3 credits

POL 254 The Politics of Governmental Planning

An examination of the governmental planning process of all levels—federal, state, regional and local—with emphasis on the theory and practice of "creative federalism" related to the process and the relationships between planning and general governmental decision making.

Prerequisite: POL 140.

3 credits

L. Koppelman

POL 255 The Presidency in the American Political System

This course analyzes how presidential power developed historically; from what sources the powers of the modern presidency emanate; how decisions are made in the presidential institution; how and to what degree presidential power may or ought to be controlled.

Prerequisite: POL 140.

Fall, 3 credits

M. Landis

POL 256 Budgetary Process

Budgetary process at all levels of gov-

ernment. Role of the budget in policy determination, in control and integration of government operations, and in relation to the private economy—planning, programming, budgeting, cost-benefit analysis.

Prerequisite: POL 140.

3 credits

POL 257 Political and Administrative Decision Making

Exploration of approaches to the study of political choice. Topics dealt with include: decision theory, bargaining and negotiation, rationality, the political context of decision, decision tools, the empirical study of decision making, social criticism and the decisionist perspective.

Prerequisite: POL 140.

3 credits

POL 263 Utopian Politics

Inquiry into the attractions and consequences of comprehensive ideological solutions to the shortcomings of the political community. Students will read four or five utopian works and a few analyses which seek to explain and evaluate this approach to political life.

Prerequisite: At least sophomore standing.

3 credits

J. Williams

POL 264 Political Theory and Public Policy

The relation between some central modern political concepts and some public policies. Such concepts as: equality; perfectability of institutions; the moral-political system; responsible government, as developed by thinkers from Rousseau to Mill. Case studies of five or six crucial policy developments (e.g., the war on poverty).

Prerequisite: POL 140.

3 credits

POL 266 Political Alienation, Protest, and Revolution

Major contemporary explanations of political alienation and political protest will

be discussed. Consideration of: 1) forms and causes of political alienation; 2) reasons for non-violent protest such as support for anti-regime political parties; 3) reasons for violent protest involving aggression against the regime; 4) conditions under which political protest leads to revolutionary change in existing regimes.

Prerequisite: POL 191.

Fall and spring, 3 credits

E. Muller

POL 267 The Politics of Inequality

The course will analyze the politics of inequality by considering the psychosocial aspects of subjection, domination and inequality. Discussion will emphasize four types of political and social subjection: imperial, sexual, racial, and generational. Emphasis will be placed on the more general aspects of these asymmetrical relationships and on the political methods by which different groups have moved toward equality in different historical and national contexts.

Prerequisite: At least sophomore standing.

3 credits

C. Whitmore

POL 268 Introduction to Public Policy

Discussion and analysis of the processes of agenda setting, formulation, implementation and evaluation of public policies in selected issue areas, such as housing, land use, education, etc. The public policy-making processes of the U.S. will be compared with those of selected other countries.

Prerequisite: POL 140.

Fall, 3 credits

F. Myers

POL 274 Polity and Economy

This course will examine questions about the relationship between the political and economic systems in modern industrial society. Special emphasis will be placed on the economic influences on political support, especially in the United States. Problems of measuring support by public opinion polls, as well as econometric

problems in analyzing the relationship between politics and the economy will also be discussed.

Prerequisite: POL 140.

Fall and spring, 3 credits

K. Monroe

POL 275 Political Psychology

Focus on the application of psychological concepts and measures to political behavior. Course topics include: attitude measurement, stability and change; obedience to authority; learning theory; attention and problem solving; personality correlates of political activity; stress; and aggression.

Prerequisites: POL 191 and permission of instructors; PSY 219 is helpful but not required.

Spring, 3 credits

M. Lodge, B. Tursky

POL 276 Experimental Political Behavior

The course will focus on selected topics in political psychology, employ experimental techniques and emphasize psycho-physiological measures of response patterns. Laboratory projects will be carried out by students in the department's psycho-physiological laboratory.

Prerequisites: POL 191, PSY 101, 102.
3 credits

M. Lodge, B. Tursky

POL 299 Directed Readings in Political Science

Individually supervised reading in selected topics of the discipline. May be repeated, but total credit may not exceed 6 credits.

Prerequisites: Political Science major, 15 credits in Political Science and permission of instructor.

Fall and spring, 1 to 3 credits

POL 330 Problems in Constitutional Law and Politics: United States

An advanced treatment of the work of the United States Supreme Court in selected areas of civil liberties and civil rights.

Particular attention is given to the methods used in legal research and analysis. A major research paper is required.

Prerequisites: POL 230 and 232 or 224.

Spring, 3 credits

J. Tanenhaus

POL 390 Undergraduate Teaching Practicum

Each student will conduct periodical recitation or laboratory section that will supplement a lecture course. The student will receive regularly scheduled supervision from the instructor. Responsibilities may include: preparing material for discussion, grading, and helping students with research papers.

Prerequisites: Upper division Political Science major, preferably senior standing, interview and permission of instructor.

Fall and spring, 3 credits

POL 391, 392 Seminars in Advanced Topics

Special projects and research papers on a topic of political interest which will be announced before the start of the term.

Prerequisite: Permission of instructor.

3 credits each semester

POL 399 Directed Research

Qualified advanced undergraduates in political science may carry out individual research projects under the direct supervision of a faculty member. May be repeated but total credit may not exceed 6 credits.

Prerequisites: Political Science major, 15 credits in Political Science and permission of instructor.

Fall and spring, 1 to 3 credits

Department of Psychology

Professors: Beverly Birns, Dana Bramel, Gerald C. Davison, John Gagnon, Michael S. Gazzaniga, James H. Geer (*Chairman*), Marvin R. Goldfried, Richard Green, Harry I. Kalish, Leonard Krasner, Marvin Levine, Robert M. Liebert, Joseph LoPiccolo, Emil Menzel, Jr., K. Daniel O'Leary, Francis H. Palmer, Howard Rachlin, Alan O. Ross, Eli Rubenstein, *Jerome Singer, John S. Stamm, Bernard Tursky, Stuart Valins, Everett J. Wyers

Associate Professors: James F. Calhoun, David Cross, Thomas D'Zurilla, David Emmerich, Ronald Friend, Marcia K. Johnson, Herbert Kaye, Fredric Levine, H. William Morrison, John M. Neale, David M. Pomeranz, Roger W. Schvaneveldt, Grover J. Whitehurst

Assistant Professors: Joanna Blake, Chester D. Copemann, Xenia Coulter, Helen Jones-Emmerich, Ronald Kent, Theodore Lidsky, Marian L. MacDonald, Gary McClure (*Adjunct*), Susan O'Leary, Sharon Rosen, Sally P. Springer, Sarah H. Sternglanz, James Tweedy, Stanley Wanat, Sheldon Weintraub (*Adjunct*)

Requirements for the Major in Psychology

In addition to the general University requirements for the Bachelor of Arts degree, the following courses are required for the major in Psychology:

A. Study within the area of the major: 30 credits in psychology to be distributed as follows:

1. Core Program:

PSY 101, 102 Introduction to Psychology
PSY 162 Statistical Methods in Psychology
PSY 199 Research Methodology
PSY 200 Research Methodology

2. Distribution requirements within the major. Two courses from each group (a and b below):

- a. PSY 208 Theories of Personality
PSY 209 Social Psychology
PSY 211 Developmental Psychology
PSY 213 Behavior Deviation in Children *or*
PSY 215 Abnormal Psychology
- b. PSY 218 Animal Learning *or* PSY 219 Human Learning *or* PSY 348 Human Memory *or* PSY 350 Cognitive Psychology
PSY 241 Introduction to the Nervous System *or*
PSY 244 Comparative Psychology
PSY 220 Motivation
PSY 221 Sensation-Perception

3. One additional course from either the 200 or 300 level.

* On leave.

B. Study in related areas

1. MSA 101 or MSC 101 or MSM 121
2. One credit BIO course
3. Choose one of the following options*:
 - a. Anthropology and/or Sociology Option
 - b. Biological Sciences Option
 - c. Computer Science Option
 - d. History of Science Option
 - e. Linguistics Option
 - f. Mathematical Sciences Option
 - g. Philosophy of Science Option
 - h. Political Science Option
 - i. Combined History and Philosophy of Science Option
 - j. Combined Mathematical and Computer Science Option
 - k. Additional Options:

The student may propose some other program of study representing a related area. Contact the Psychology Department office for details on how to do this. Students who are carrying a double major will be automatically granted approval for option (k) upon application.

In fulfilling the above requirements (A and B) the student must take courses for letter grades. Some of the above courses may also fulfill University requirements. The program outlined above presents the general major requirements. In addition, the department recommends that students who plan to enter graduate school in psychology include in, or add to, their programs an advanced laboratory (PSY 301-306)).

Note: No more than 6 credits in Psychology 205, 330, 332, and/or 390 may be taken in one semester. (No more than a total of 30 of these credits will be counted towards graduation.) See also Independent Study Program, page 73, for further limits on directed readings and research courses, and page 74 for further instructions on undergraduate teaching practica.

Courses**

PSY 101, 102 Introduction to Psychology

An introduction to psychology as the science of behavior. First semester: an intensive investigation of the major research areas covering learning, perception and the physiological foundations of

behavior. Second semester: an introduction to the areas of personality theory, testing, and social and developmental psychology. Students may choose to participate in experiments or in a library research project.

Fall and spring, 3 credits each semester

* Specific course requirements for each option should be obtained from the Psychology Department Office. Majors must file option and course selection with the Department at the beginning of the semester preceding graduation.

**See p. 75, Information About Course Credit.

PSY 162 Statistical Methods in Psychology

The use and interpretation of elementary statistical techniques in research, emphasizing descriptive statistics, correlational analysis and inferential statistics, including chi-square, critical ratio, t, F and certain selected non-parametric techniques.

Prerequisites: PSY 101 and MSA 101 or MSC 101 or MSM 121.

Fall and spring, 3 credits

PSY 199 Research Methodology

Basic principles in the design and execution of research in psychology.

Prerequisite: PSY 162.

Fall and spring, 3 credits

PSY 200 Research Methodology Laboratory

Designed to provide an introduction to basic techniques in research through laboratory experience.

Prerequisite: PSY 199.

Fall and spring, 3 credits

PSY 205 Applications and Community Service

Designed to provide opportunities for students to study and apply psychological principles outside the classroom (e.g., in settings such as hospitals and schools). Specific programs will vary from semester to semester. General information is available in the Undergraduate Activities Office in the psychology department. Grading in this course will be Satisfactory/Unsatisfactory only. May be repeated up to a limit of 6 credits.

Prerequisite: Permission of instructor.

Fall and spring, 1 to 3 credits

J. Calhoun, F. Levine, MacDonald, G. McClure

PSY 208 Theories of Personality

Contemporary theories of personality with emphasis on the experimental literature pertaining to personality development and current methods of personality as-

essment in the applied areas.

Prerequisites: PSY 101, 102.

Fall and spring, 3 credits

J. Calhoun

PSY 209 Social Psychology

Communication, attitude formation and change, social perception, interpersonal relations and group performance.

Prerequisites: PSY 101, 102; not open to students who have taken PSY 309.

Fall and spring, 3 credits

PSY 210 Studies of Social Conflict

Students will formulate and carry out team research projects focusing on issues involving conflict within the University or in the surrounding communities.

Prerequisites: PSY 101, 102, 162 and permission of instructor.

Fall and spring, 3 credits

D. Bramel

PSY 211 Developmental Psychology

A study of the growth processes from fetal development to late childhood. Perceptual and learning characteristics are explained as they relate to increases in cognitive and social competence in the total community. Biological factors are examined as they relate to inheritance of behavior patterns.

Prerequisites: PSY 101, 102.

Fall and spring, 3 credits

PSY 213 Behavior Deviation in Children

Development and modification of behavioral deviations in children. Application of principles derived from experimental analysis of behavior to problems of children.

Prerequisite: PSY 211.

Fall and spring, 3 credits

A. Ross and Staff

PSY 215 Abnormal Psychology

Psychopathology, including the neuroses and functional and organic psychoses, will be examined. Analysis of current

research in psychopathology and its relationship to the theories of abnormal behavior.

Prerequisites: PSY 101, 102.

Fall and spring, 3 credits

L. Krasner, J. Neale, D. Pomeranz

PSY 217 Sexual Behavior

This course will cover currently available material on patterns of sexual behavior. Material covered will include biological and sociological as well as psychological considerations. The course will present a systematic examination of the area and will include discussion of typical patterns of sexual behavior as well as consideration of sexual dysfunction and treatment. The major emphasis will be upon human sexuality; however, animal data will be presented where deemed appropriate. A substantial portion of the discussion will focus upon similarities and differences between the sexes.

Prerequisites: PSY 101, 102 and permission of instructor.

Fall, 3 credits

J. Geer

PSY 218 Animal Learning

Principles and techniques by which the behavior of organisms may be modified. The effects of reward and punishment and the techniques of stimuli control.

Prerequisites: PSY 101, 102

Fall and spring, 3 credits

E. Menzel, H. Rachlin

PSY 219 Human Learning

Basic concepts, empirical findings and theoretical interpretation in the experimental study of learning and motivation.

Prerequisites: PSY 101, 102

Fall or spring, 3 credits

M. Levine

PSY 220 Motivation

Theories of motivation from biological to existential and how they apply to human behavior.

Prerequisites: PSY 101, 102.

Fall, 3 credits

F. Levine

PSY 221 Sensation-Perception

Phenomena of sensation and perception and the methods by which they may be studied. Different theoretical frameworks will be considered.

Prerequisites: PSY 101, 102

Fall and spring, 3 credits

D. Emmerich

PSY 241 Introduction to the Nervous System

Comparative survey of the gross and microscopic anatomy of nervous systems from coelenterates to primates. The physiological basis of behavioral organization with emphasis on the increasing structural complexities of nervous systems and behavior.

Prerequisite: PSY 101 or BIO 101.

Fall, 3 credits

E. Wyers

PSY 244 Comparative Psychology

The phylogenetic distribution and evolution of both learned and unlearned behavioral patterns including kineses, taxes, instinct, respondent and operant conditioning, generalization and discrimination.

Prerequisites: PSY 101, 102 and BIO 101 or equivalent.

Spring, 3 credits

E. Menzel, E. Wyers

PSY 250 Organizational Psychology

Survey of the principles, the process and the problems related to work organizations. Topics such as morale, motivation, communication, bureaucracy, leadership and organizational development will be discussed.

Prerequisites: PSY 101, 102 and 208 or 209.

Fall, 3 credits

PSY 301 Laboratory in Perception

Techniques and experimental problems in perception and sensation on the visual, auditory and tactual senses. Role of motivation and selective attention on the

detection and recognition of stimuli will be investigated.

Prerequisites: PSY 200 and permission of instructor.

Fall and spring, 4 credits

PSY 302 Laboratory in Physiological Psychology

Techniques and experimental problems in the neurophysiological correlates of behavior including sensation, perception, motivation, learning and memory.

Prerequisites: PSY 200 and permission of instructor.

Fall and spring, 4 credits

E. Menzel

PSY 303 Laboratory in Personality

Techniques and experimental problems in personality and emotion. Experiments will cover the major propositions from prominent theories of personality.

Prerequisites: PSY 200 and permission of instructor.

Fall and spring, 4 credits

PSY 304 Laboratory in Social Psychology

Techniques and experimental problems in social psychology, including natural observation, surveys and experimental design.

Prerequisites: PSY 200, 309 and permission of instructor.

Fall and spring, 4 credits

PSY 306 Laboratory in Learning and Performance

Experimental methodology as applied to associative and motivational processes: response acquisition and extinction, reward and punishment, discrimination learning, retention, perceptual-motor skills and cognitive processes.

Prerequisites: PSY 200 and permission of instructor.

Fall and spring, 4 credits

PSY 309 Experimental Social Psychology

An intensive treatment of several main topics in social psychology; consistency

theory, pressures to uniformity, models of attitude change, social comparison and attribution theory. Not open to students who have taken PSY 209.

Prerequisites: PSY 162 and permission of instructor.

Fall, 3 credits

PSY 313 Behavioral Tutoring

Application of psychological principles to reduction of psychological disorders of children. Students are given the opportunity to apply the principles studied in PSY 213 under close supervision to children with such behavior problems as specific learning disabilities or social skill deficits. May be repeated once with permission of instructor.

Prerequisite: PSY 213

Fall and spring, 3 credits

PSY 315 Behavior Modification

Philosophical and experimental foundations of behavior modification. Not designed for specific training in clinical techniques, but issues related to clinical application will be considered.

Prerequisites: PSY 101, 102, 162, 200, 215 and upper division standing.

Fall and spring, 3 credits

T. D'Zurilla

PSY 317 Behavior Influence and Planned Environments

The concept of "planned environments" as illustrated by research and application of behavior modification, environmental psychology and open education.

Prerequisites: PSY 213 and 215.

Fall, 3 credits

L. Krasner

PSY 322 Advanced Statistics

Survey of probability and sampling theory, descriptive and inferential statistics and introduction to experimental design.

Prerequisite: PSY 162.

Not offered 1976-77.

H. Morrison

PSY 330 Research in Psychology

Laboratory or field work under the direct supervision of a faculty member in the Department of Psychology. May be repeated.

Prerequisites: Major in psychology, upper division standing and *written* permission of the faculty supervisor on file in the department.

Fall and spring, 1 to 6 credits each semester

Staff

PSY 332 Readings in Psychology

Directed readings under the guidance of a faculty member. May be repeated.

Prerequisites: Major in psychology, upper division standing, *written* permission of the faculty supervisor on file in the department.

Fall and spring, 1 to 6 credits each semester

Staff

PSY 340 Physiological Psychology

The functions of the primate brain in behavioral processes covering sensations, perception, states of consciousness, motivation, learning, memory and language.

Prerequisites: PSY 101, 102 and BIO 101 or equivalent.

Fall, 3 credits

J. Stamm

PSY 343 Electrical and Chemical Brain Stimulation

Behavioral processes studied by the methods of electrical and chemical stimulation of the brain. Consideration of the electrophysiological and biochemical bases of learning, memory and motivation.

Prerequisite: PSY 340.

Fall, 3 credits

PSY 348 Human Memory

Survey of recent theory and current research on the nature of human memory including iconic, short- and long-term

memory, the nature of imagery, rehearsal, mnemonic strategies.

Prerequisite: PSY 200.

Fall or spring, 3 credits

PSY 350 Cognitive Psychology

An examination of theoretical and empirical work on human cognition. Emphasis will be placed on information processing analysis of perception and pattern recognition, memory, attention, decision and response processes.

Prerequisite: PSY 200.

Fall or spring

R. Schvaneveldt

PSY 352 History and Systems of Psychology

History and present status of conceptual trends in psychology. Psychological principles and theories traced from the early Greek philosophers through the European philosophers and empiricists to their embodiment in contemporary psychological theory.

Prerequisite: Nine credits of psychology.

Spring, 3 credits

Staff

PSY 370 The Psychology of Language

Examination of language and a consideration of its implications for cognitive psychology.

Prerequisites: PSY 101, 102, 219.

3 credits

Not offered in 1976-77.

PSY 372 Tests and Measurements in Personality

A study of principles of psychological assessment of personality with emphasis on theory and practice and principles of measurement theory and correlational techniques. Students will have opportunity to develop a personality test and put these principles and techniques into practice.

Prerequisites: PSY 101, 102 and permission of instructor.

Fall, 3 credits

PSY 373 Theory of Psychological Scaling

Analyzes alternative models for transforming behavioral observations into inferred relations among stimuli and/or individuals. Presents a framework within which the various scaling techniques can be grouped and their relationships understood, considering tasks to which the methods may apply, information which can be inferred and testable consistencies implied.

Prerequisite: PSY 162.

3 credits

Not offered in 1976-77.

H. Morrison

PSY 381, 382 Introduction to Mathematical Psychology

Mathematical formulations of theories of behavioral phenomena, with emphasis on learning. Attention to turning intuition into theory, mathematical tools and techniques and evaluating such theories. Student will complete individual project in second term.

Prerequisites: PSY 162 and MSM 122.

Fall and spring, 3 credits each semester.

Not offered 1976-77.

PSY 390 Undergraduate Teaching Practicum

Each student will conduct a weekly recitation or laboratory section that will supplement a lecture course. The student will receive regularly scheduled supervision from the instructor or the graduate assistant. Responsibilities may include: preparing material for discussion, grading and helping students with research papers. Grading in this course shall be Satisfactory/Unsatisfactory only. May not be repeated.

Prerequisites: Senior psychology major and permission of instructor.

Fall and spring, 3 credits

PSY 391, 392 Special Topics in Psychological Research and Theory

Seminar for selected senior majors dealing with current research and theory in areas of special interest. Topics will be announced prior to the beginning of each semester.

Prerequisites: PSY 200 and written permission of instructor and the department.

Fall and spring, 3 credits each semester

Puerto Rican Studies Program

Program Director: Juan E. Mestas

Lecturers: Doris Gonzalez-Stratmann, Nigda Brasch

PRS 101 The Culture of Puerto Rico

A study of the various components of Puerto Rican culture, including geographic and racial factors, developments in the arts, and social and political problems.

Fall and spring, 3 credits

J. Mestas

PRS 102 The Culture of Puerto Ricans in the United States

A study of the various components of

Puerto Rican culture in the United States, from a historic, social and political perspective.

Fall and spring, 3 credits

J. Mestas

PRS 155 History of Puerto Rico

A survey of the historical development of the Puerto Rican people from pre-Columbian times to the present.

Fall and spring, 3 credits

PRS 202 Educating the Puerto Rican Child

This course will involve an assessment of the unique needs of the Puerto Rican child in a learning situation. Emphasis will be given to the language problem, as well as to cultural characteristics of the Puerto Rican student and his home environment and how these factors affect classroom performance.

Prerequisite: Permission of instructor.

3 credits

N. Brasch

PRS 220 Government and Politics in Puerto Rico

An analysis and study of the governmental structure and political institutions of Puerto Rico. This course is identical with POL 220.

Prerequisite: POL 151.

3 credits

D. Gonzalez-Stratmann

PRS 295 Topics in Puerto Rican Studies

A selected topic for research and discussion will be announced at the beginning of each semester. Students will be given the opportunity to examine one aspect of the Puerto Rican experience in depth and to familiarize themselves with materials available. May be repeated once.

Prerequisites: Six credits in PRS.

3 credits

PRS 299 Directed Readings

A student will, in conjunction and with approval of a faculty member, select a topic for specialized reading and concentrated study. The range of possibilities will include the island and the mainland experience of the Puerto Rican people. May be repeated up to a limit of six credits.

Prerequisites: Six credits in Puerto Rican Studies courses and permission of program chairman.

Fall and spring, 1 to 6 credits

Interdisciplinary Program in Religious Studies

Chairman: Thomas J. J. Altizer

The interdisciplinary program in religious studies (RLS) is designed as a highly flexible curriculum which will introduce undergraduates to several distinct areas of religious study by combining appropriate courses from such varied disciplines as philosophy, literature and certain of the social sciences. The program is intended both as preparation for graduate study in religion and as an opportunity for interested students to explore a wide range of religious phenomena. The courses listed below have been chosen as appropriate for the religious studies major. The student, in consultation with his or her academic advisor, may combine them in a variety of ways to create a program which meets individual interests. Additional courses are under consideration and will be announced as they become available.

Further information about the program may be obtained from the chairman.

Requirements for the Major in Religious Studies

In addition to the general University requirements for the Bachelor of Arts degree, a student majoring in this program must earn a minimum of 30 credits distributed as follows:

	Credits
I. At least two semester courses in each of three areas:	24
A. Religious literature	
B. Theory of religious thought	
C. Socio-historical studies of religion	
II. Two semester courses in <i>either</i> of the following:	6
A. Symposium in religious studies or	
B. Directed study in a special area	
	—
	30

Courses*

Detailed course descriptions appear under appropriate departmental listings and should be examined there.

ANT 251 *Comparative Religious Systems*

AFS 211 *Comparative African Religions*

CLS 115 *Classical Mythology*

EGL 242 *Milton*

EGL 260 *Mythology in Literature*

EGL 261 *The Bible as Literature*

HIS 204 *Medieval History, 300-1100*

HIS 207 *The Age of Reformation*

INT/INT 150, 151 *Civilization of Israel I, II*

PHI 204 *Medieval Philosophy*

PHI 210 *Introduction to Indian Philosophy: Classical Texts*

PHI 211 *Introduction to Indian Philosophical Schools*

PHI 212 *Introduction to Chinese Philosophy*

PHI 228 *Philosophy of Religion*

PHI 238 *Indian Buddhism: Its Essence and Development*

PHI 239 *Chinese and Japanese Buddhism*

PHI 317 *Philosophy of Myth*

PHI 318 *The Philosophical Methodology of the Rig Veda*

SOC 235 *Sociology of Religion*

THR 254 *Asian Theatre*

RLS 201 *Fundamentals of Religion*

A critical introduction to the study of religion focusing upon both the modern understanding of religion and the situation of religion in the modern world.

Fall, 3 credits

T. Altizer

RLS 202 *Contemporary Theology*

A critical examination of contemporary theology with a primary emphasis upon modern Christian and radical theology.

Prerequisite: RLS 201.

Spring, 3 credits

T. Altizer

RLS 230 *Special Topics*

An investigation of a particular area or dimension of religious studies which will vary from semester to semester. May be repeated with permission of chairman.

Fall and spring, 3 credits

*See p. 75, Information About Course Credit.

RLS 299 Readings in Religious Studies

Intensive study of a special topic in religious studies undertaken under close faculty supervision. May be repeated.

Prerequisite: Permission of program chairman.

1 to 6 credits

Interdisciplinary Program in Social Sciences

Chairman: Joel T. Rosenthal (Department of History)

Professors: Beverly Birns, Eli Seifman

This interdisciplinary degree program (SSC) is designed for students with broad interests in the findings, questions and methods of the social and behavioral sciences. Individual plans of study can be created by combining courses chosen from among the offerings of six departments: Anthropology, Economics, History, Political Science, Psychology and Sociology. In addition, courses sponsored directly by the interdisciplinary program in social sciences (e.g., SSC 101, 102, 303, etc.) may be used to satisfy *one* of the requirements for a departmental concentration (as in A, B or C below).

Requirements for the Major in Social Sciences

In addition to the general University requirements for the Bachelor of Arts degree, the following courses are required for the interdisciplinary major in social sciences.

Courses in at least four different social science departments distributed as follows:

	<i>Credits</i>
A. Two courses in <i>each</i> of any two departments	12
B. Four courses in <i>each</i> of any two other departments (At least two of the courses in each department must be beyond the introductory level.)	24
C. Four additional courses beyond the introductory level in any social science department or departments.	12
	<hr/>
<i>Total</i>	48

In Addition:

1. At least 36 credits of the 48 must be earned by letter grade.
2. No more than 9 credits of reading and research may be taken, and no more than 6 credits of such work can come from any single department or program.

Further information about the SSC major, and about the specific content of the SSC courses offered each semester may be obtained in the Undergraduate Studies Office.

Courses*

The following courses may be used to meet the general University requirement in social sciences as well as to satisfy certain of the requirements of the SSC interdisciplinary major.

SSC 101 Social Control

An introductory exploration of the nature and variety of social organization. Special attention is paid to political philosophy, to the concept of "social determinism" and to various forms of social bond and constraint. Readings will be drawn from the various social sciences.

Prerequisite: Freshman standing.

Fall, 3 credits

SSC 102 Social Change

An examination of the nature of change in society. Both planned and unplanned, individual, small group and national level social change will be studied. Readings will be drawn from the various social sciences.

Prerequisite: Freshman standing.

Spring, 3 credits

SSC 303, 304 Methods in the Social Sciences

This course is designed for social science students who want an introduction to the premises, modes of inquiry and methods of the social sciences. Different analytical methods will be covered. May be repeated.

Prerequisites: Upper division standing and 18 hours of social sciences credit.

Spring, 3 credits

SSC 311, 312 Interdisciplinary Problems in the Social Sciences

This course is designed to treat a problem that has been tackled by a number of the social sciences. It illustrates the different natures of approach, method and findings. The actual problem chosen will vary from semester to semester. May be repeated.

Prerequisites: Upper division standing and 18 hours of social sciences credit.

Fall, 3 credits

SSC 399 Independent Project in the Social Sciences

Interdisciplinary independent projects in the social sciences designed to enable students to combine academic and field work on a practical or community problem. There will be an emphasis on team projects under special supervision. May be repeated.

Prerequisites: Upper division standing, 18 hours in the social sciences and permission of program chairman.

Fall and spring, 1 to 6 credits

Staff

*See p. 75, Information About Course Credit.

Social Studies Secondary Teacher Provisional New York State Certification Program

Program Advisor: Eli Seifman

This program offers the student the opportunity to prepare for a teaching career and to complete the requirements for a New York State Provisional Certificate as a teacher of Secondary School Social Studies. The program has been approved by and is officially registered with the State Education Department.

In the selection of courses to satisfy the requirements listed below, a student and his or her advisor should make every effort to construct a program which leads to knowledge and understanding of a particular society with a language and a culture different from those of the student.

Requirements

- A. One hundred-twenty credits of passing work with cumulative grade point average of 2.0, i.e., "satisfactory" or C-level
- B. General Education Background
(See p. 71)

- C. Preparation in Social Science

A minimum of 45 credits in social science departments or interdisciplinary programs, excluding psychology and education. For departmental majors, this must include at least 15 credits outside the major department.

1. Included in the social science credits must be at least 15 credits of history, distributed as follows: six credits in U. S. history; six credits in European history; and three credits in history other than U.S. or European.
2. The major requirements of one of the following departments or interdisciplinary programs: Africana Studies, Anthropology, Economics, History, Political Science, Social Sciences Interdisciplinary Program, Sociology. Only the majors specified here are acceptable for the Social Studies Secondary Teacher Certification Program.
3. Of the required courses in social science taken outside the major departments, at least half must be chosen from courses listed beyond the introductory level as defined by the College Curriculum Committee.

Credits
45

D. Preparation in Related Fields (not Social Science):	9
<p>Nine credits to be selected in other appropriate related fields with permissions of the Social Studies Teacher Certification Program advisor. At least three credits of the total must be chosen from courses beyond the introductory level.</p>	
E. Preparation in Education:	24
<p>These requirements include a course in adolescent growth and development, training in drug and alcohol abuse education, and six credits in methods and materials of teaching social studies as well as student teaching and a student-teaching seminar. Because a reorganization of the secondary teacher training program is now taking place, precise course designations will be available in the Undergraduate Studies Office.</p>	
<i>Total</i>	78

Department of Sociology

Distinguished Professor: Lewis A. Coser

Professors: Stephen Cole, Rose Laub Coser (*Joint*), John H. Gagnon, Norman Goodman (*Chairman*), Robert W. Hodge, Gladys E. Lang, Kurt Lang, Charles B. Perrow, Hanan C. Selvin, *Jerome E. Singer, Gerald Suttles, Eugene A. Weinstein

Associate Professors: Andrew Collver, Kenneth A. Feldman, Erich Goode, Ned Polsky, James B. Rule, Michael Schwartz, Andrea Tyree, Sasha Weitman

Assistant Professors: Wallace Davis, Forrest Dill, Kirsten Gronbjerg, John Logan, Terry Rosenberg, Judith Tanur, Gerald Zeitz

Lecturers: Paul Allison, Paget Henry

Requirements for the Major in Sociology

In addition to the general University requirements for the Bachelor of Arts degree, the following are required for the major in sociology:

	<i>Credits</i>
A. <i>Study within the area of the major:</i>	30
1. Required courses:	12
SOC 103 Introduction to Sociology	
SOC 201 Research Methods in Sociology (to be	

*On leave.

taken no later than the sophomore year; SOC 211-212 may be substituted)

SOC 361 Historical Development of Contemporary Sociology

SOC 362 Introduction to Sociological Theory (SOC 361 and 362 should be taken consecutively during the junior or senior year.)

2. Sociology electives

Option 1: Free selection of courses from among all sociology course offerings.

Option 2: Concentration in one or more of the following areas: Comparative political sociology; the sociology of culture; urban sociology; sociological methodology; social psychology; applied sociology; pre-teaching, pre-graduate school; pre-law school. (Further information and guidance is available from departmental advisors.)

Option 3: Systematic selection of courses from a limited number of concentrations.

18

Total 60

Note: SOC 202 Statistical Methods in Sociology or SOC 211-212 are recommended for majors considering graduate study.

B. Study in related areas:

1. MSM 121 Calculus I or MSA 101 Introduction to Finite Mathematics or two other courses in mathematics chosen with departmental approval. The department urges students to fulfill the mathematics requirement as early in their college careers as possible.
2. At least three appropriate courses (9 credits) chosen with departmental approval from one of the following related social sciences: anthropology, economics, history, political science and psychology. (Credits from applied social science professions like social work, police science, education and management science are not applicable.)

C. No more than two courses of the requirements of the department, including sociology electives (A2 above), mathematics (B1 above), and related social science courses (B2 above), but excluding required sociology courses (A1 above) may be taken pass/no credit. None of the required sociology courses may be taken pass/no credit.

Transfer Students

Many sociology majors are transfer students, and some special regulations apply to them:

1. Transfer students who are transferring the required courses

(SOC 103, SOC 201, SOC 361, and SOC 362) into the department are required to have a grade of C or better in that course from their previous institutions. This means that if a grade of less than C is presented for such a transfer course, the department will not accept it for credit.

2. While any grade of D or better will count toward the major for any course taken at Stony Brook, no grade of less than C for a course taken elsewhere than at Stony Brook will be accepted for credit in the major.

3. For the requirement of three courses in a related social science and the mathematics requirement (B1 and 2 above) any passing grade will be sufficient to transfer for credit.

4. The sociology department requires that transfer students take at least 12 credits in sociology in residence at Stony Brook to complete the sociology major.

Honors Program

Students with very good academic records and high motivation to do challenging independent work in sociology may consider applying to the Honors Program.

Admissions Requirements

The requirements for admission to the program are:

- (1) junior or senior standing;
- (2) completion of at least 15 credits in sociology, including SOC 103, SOC 201, SOC 361 and/or SOC 362;
- (3) recommendation by a faculty sponsor; and
- (4) recommendation by the Honors Program advisor, based on a review of the candidate's academic record and a personal interview.

Completion Requirements

If a student is admitted to the honors program with only one of the courses SOC 361 or SOC 362, he/she must still take the other course as part of the requirement for graduation. After admission to the program, the student is expected to pass SOC 397 (Honors Seminar on Sociological Theory and Research) and to successfully complete SOC 398 (Honors Thesis).

Courses*

SOC 103 Introduction to Sociology

A survey of the main concepts in sociological analysis. This course is the prerequisite for all further courses in sociology.

Fall and spring, 3 credits

SOC 201 Research Methods in Sociology

Methods of collecting and analyzing empirical data to test sociological hypotheses. Emphasis will be on multivariate analysis of tabular and statistical data. Students planning on graduate work in sociology should consider SOC 211-212 instead of SOC 201.

Prerequisite: SOC 103.

Fall and spring, 3 credits

SOC 202 Statistical Methods in Sociology

An introduction to the use and interpretation of statistical methods in social research; descriptive and inferential statistics. May not be taken for credit after any other statistics course.

Prerequisite: SOC 103.

Fall, 3 credits

SOC 203 Social Stratification

Theories of social stratification; patterns of differentiation in wealth, prestige and power; social mobility; power structures and elites.

Prerequisite: SOC 103.

Spring, 3 credits

K. Gronbjerg, R. Hodge, A. Tyree

SOC 204 Courtship and Marriage

Social factors affecting courtship, mate-selection and engagement; dynamics of marital adjustment and parenthood.

Prerequisite: SOC 103

Fall and spring, 3 credits

J. Gagnon, N. Goodman, H. Selvin

SOC 205 Principles of Sociology

This is an introduction for upper division students committed to a major in a different field who want to find out how the sociologist looks at the world. The course will illustrate the use of a sociological perspective in the analysis of the social world, rather than focus on sociological concept development. Topics to be included will be chosen from among the following: ethnic relations, deviance and delinquency, socialization, organizational analysis, the family as a social institution, population analysis, urban life. Not for major credit.

Prerequisites: Upper division standing and a major other than sociology.

Fall, 3 credits

SOC 206 American Society

This course is intended for upper division students committed to a major in a different field who wish to look at American society through the eyes of the sociologist. Included in the course is the sociological view of American social structure in terms of power and patterns of inequality, the legal system, ethnic relations, social mobility, and urban problems. Not for major credit.

Prerequisites: Upper division standing and a major other than sociology.

Spring, 3 credits

SOC 207 Social Planning

Deliberate attempts to introduce change in society; methods of evaluating the success of social change programs; conditions affecting the success of such programs.

Prerequisite: SOC 103.

Fall, 3 credits

A. Collver, J. Logan

SOC 208 Poverty and Social Welfare

Consideration of the historical and contemporary social definitions, distribution and status of the poor in the United States; analysis of alternative explana-

*See p. 75, Information About Course Credit.

tions for their situation; and study of the effects of social welfare institutions upon the poor.

Prerequisite: SOC 103.

Fall and spring, 3 credits

K. Gronbjerg, G. Suttles

SOC 209 Social Conflicts and Movements

An examination of aggregate phenomena. "Revolutionary" and "counter-revolutionary" programs and organizations. Historical and cross-cultural examples will be emphasized.

Prerequisite: SOC 103.

Spring, 3 credits

L. Coser, P. Henry, M. Schwartz

SOC 210 Ethnic Relations

(Formerly SOC 161)

The formation, migrations and conflicts of ethnic and other minority groups; prejudice, discrimination and minority self-hatred.

Prerequisite: SOC 103.

Fall and spring, 3 credits

T. Rosenberg, M. Schwartz, G. Suttles

SOC 211-212 Methods and Statistics, I, II

Students wishing a more thoroughly integrated view of sociological methodology, and the place that statistical techniques have in it, should register for this two-semester course rather than for SOC 201 and/or SOC 202. Students will learn descriptive and inferential statistics in the course of designing and carrying out either individual or group research projects; the students will consider the interrelations between theory and research as well as the mechanics of carrying out the research process. Every student will be required to analyze a set of data and to write a research report. SOC 201 and SOC 202 are not available for credit for students taking SOC 211-212, and this course fulfills the methodology requirement for the major.

Prerequisite: SOC 103.

Fall (211) and spring (212), 3 credits each semester

SOC 220 Population Problems

Sources and consequences of changes in population size and composition; the "demographic explosion."

Prerequisite: SOC 103.

Fall, 3 credits

SOC 223 Urban Society

The emergence of cities and the process of urbanization; an examination of urban structure. The consequences of the urban milieu for interpersonal relations and institutions.

Prerequisite: SOC 103.

Fall and spring, 3 credits

A. Collver, K. Gronbjerg, G. Suttles

SOC 235 Sociology of Religion

The ways in which sociocultural processes affect and are influenced by religious belief systems and organizations; changing structures and functions of religious institutions.

Prerequisite: SOC 103.

Fall, alternate years, 3 credits. (Not offered 1976-77.)

SOC 236 Social Change

The impact of technological, generational and cultural forces on social organization from a historical and comparative perspective.

Prerequisite: SOC 103.

Spring, 3 credits

J. Gagnon, P. Henry, C. Perrow

SOC 237, 238 Sociology of Deviance and Crime

(Formerly SOC 237 and SOC 239)

This is an integrated consideration of deviance, crime and delinquency from a sociological perspective. The first semester will focus on competing theories of the nature and etiology of deviant and criminal behavior, problems of research in these areas (and the related technical, legal and ethical issues), and substantive findings for "non-victim" crimes and legal but morally stigmatized behavior. The second term will include topics on the substantive findings about ju-

venile crime, adult victim crime, and a sociological view of the control of deviant and criminal behavior.

Prerequisite to SOC 237: SOC 103.

Prerequisite to SOC 238: SOC 237.

Fall and spring, 3 credits each semester

SOC 241 Social Psychology

Individual and social factors in human behavior; the structure of personality; identity development; communication processes, attitudes.

Prerequisites: SOC 103 and PSY 101.

Fall and spring, 3 credits

SOC 243 Sociology of Youth

Adolescent socialization; age structures and intergenerational conflict; peer groups and youth subcultures.

Prerequisite: SOC 103.

Fall and spring, 3 credits

K. Feldman

SOC 247 Women and Men

The roles of women and men in modern society. Changing relations between the sexes. Women's liberation and related movements.

Prerequisite: SOC 103.

Fall and spring, 3 credits

R. Coser, E. Goode, T. Rosenberg

SOC 251 Work and the Professions

The social patterning of work situations and careers; relations of work organizations to each other and to larger social structures.

Prerequisite: SOC 103.

Fall, 3 credits

K. Gronbjerg, G. Zeitz

SOC 253 Sociology of Science

Social influences on the choice of research problems and on the behavior of scientists; the social organization of scientific enterprises.

Prerequisite: SOC 103.

Fall, alternate years, 3 credits

P. Allison, S. Cole

SOC 254 Sociology of Law

Law as an institution of social control; the legal profession, court systems and bureaucratization of the legal process; the relation of law to social change.

Prerequisite: SOC 103.

Spring, 3 credits

F. Dill

SOC 256 Political Sociology

Social structure and processes as affecting, and affected by, political behavior and organizations; the sociology of power, authority and legitimacy.

Prerequisite: SOC 103.

Fall and spring, 3 credits

L. Coser, M. Schwartz

SOC 260 Comparative Social Structures

The principal complex societies and their central institutions, with emphasis on industrialization and economic development.

Prerequisite: SOC 103.

Spring, 3 credits

SOC 262 Mass Communications

Social influences on the content and effects of mass communications; communication systems; the public functions of mass communication.

Prerequisite: SOC 103.

Fall, 3 credits

G. Lang, K. Lang

SOC 263 Collective Behavior

Major unstructured social phenomena, such as mob violence, panics, fads and fashions and public opinion, as the outcome of collective problem-solving activity.

Prerequisite: SOC 103.

Spring, 3 credits

G. Lang, K. Lang

SOC 281 Sociology of Organizations

Bureaucracy as a form of organization; the structure of relations between and

within organizations.

Prerequisite: SOC 103.

Fall, alternate years, 3 credits. (Not offered 1976-77.)

SOC 282 Small Groups

The structure and functioning of face-to-face groups in field and laboratory settings.

Prerequisite: SOC 103.

Spring, alternate years, 3 credits. (Not offered 1976-77.)

SOC 287 Sociology of Education

Educational institutions as social systems; social patterns in the life-cycles of students and teachers; class and ethnic factors in educational development.

Prerequisite: SOC 103.

Fall, 3 credits

W. Davis, K. Feldman, G. Lang

SOC 291 Special Topics

Lectures on topics of current sociological interest which will be announced before the start of the term. May be repeated.

Prerequisite: SOC 103.

Fall and spring, 3 credits

SOC 299 Independent Readings or Research

Work on a special project of advanced reading or research with the guidance of a faculty member. May be repeated. No more than six credits may be counted toward the major.

Prerequisites: Written permission of instructor and of the director of undergraduate studies.

Fall and spring, 1 to 6 credits

SOC 304 Sociology of the Family

Analysis of the family as a major social institution; examination of the structure and functions of the family in various societies.

Prerequisite: SOC 103.

Spring, 3 credits

R. Coser, N. Goodman, H. Selvin

SOC 341 Historical Sociology

Sociological theories and methods applied to the study of historical phenomena such as revolutions, migration and industrialization.

Prerequisites: SOC 103 and permission of instructor.

Fall, alternate years, 3 credits

W. Davis, J. Rule, S. Weitman

SOC 351 Sociology of Literature

Literature as a symbolic expression of social structure, the relations between literary movements and other forms of social activity.

Prerequisites: SOC 103 and permission of instructor.

Spring, alternate years, 3 credits

L. Coser, N. Polsky, S. Weitman

SOC 358 War and Military Institutions

The role of violence in social affairs; military organizations; civil-military relations.

Prerequisite: SOC 103.

Fall, alternate years, 3 credits. (Not offered 1976-77.)

SOC 361 Historical Development of Contemporary Sociology

Main currents in the development of theories and empirical studies of society, culture and personality.

Prerequisite: SOC 103.

Fall and spring, 3 credits

SOC 362 Introduction to Sociological Theory

A systematic treatment of the dominant general orientations in sociology including structural-functional analysis and symbolic interactionism.

Prerequisite: SOC 103.

Fall and spring, 3 credits

SOC 391, 392 Senior Seminars in Sociology

Special projects and research papers on a topic of sociological interest, which will

be announced before the start of the term. May not be repeated.

Prerequisite: Permission of instructor.

3 credits each semester

SOC 397 Honors Seminar in Sociological Theory and Research

An intensive examination of sociological theory. Special attention will be paid to the ways in which theoretical ideas can be empirically tested. This course is intended primarily for students planning to do graduate or professional work in the social sciences; it is *required* of students who wish to graduate with

honors in sociology, to be taken preferably in the junior year.

Prerequisites: Upper division standing and admission to the Honors Program.

4 credits

SOC 398 Honors Thesis

Research and writing on a topic chosen in consultation with Honors Program advisor and Honors thesis advisor. Regular conferences with thesis advisor. May be repeated up to a total of six credits.

Prerequisite: Admission to the Honors Program.

Fall and spring, 1 to 6 credits

Department of Theatre Arts

Associate Professors: Leonard Auerbach (*Chairman*), William J. Bruehl, Richard Dyer-Bennet, Richard Hartzell, Thomas Neumiller, Louis S. Peterson, Charles Vicinus

Assistant Professors: Joseph Gelmis (*Adjunct*), William Groom

Lecturer: Joel Schechter

Requirements for the Major in Theatre Arts

In addition to the general University requirements for the Bachelor of Arts degree, the following courses are required for the major in theatre arts:

	<i>Credits</i>
THR 101 Introduction to the Theatre	3
THR 130 Voice Training	1
THR 132 Technical Theatre	3
THR 136 Acting I	3
THR 138 Movement as Medium	3
Either THR 114 Rehearsal and Performance or	
THR 116 Technical Production	1
THR 201, 202 The Pro-Seminar	6
* A Minimum of Nine Credits from Courses on the 300 level	9
* Courses from the remaining departmental offerings to total 12 credits	12
	<hr style="width: 100px; margin-left: auto; margin-right: 0;"/>
<i>Total</i>	41

Courses*

Some theatre-related courses outside the departmental offerings may be substituted, with the approval of the departmental advisor.

THR 101 Introduction to the Theatre

An introduction to, and analysis of, the forms of theatre. In addition to a study of selected plays, classes will include lectures by specialists and scenes acted by students. All lectures will be followed by discussion.

Fall and spring, 3 credits

J. Schechter

THR 114 Rehearsal and Performance

Open to students cast in departmental productions directed by a faculty member. May be repeated, but will count toward fulfillment of major requirements only once.

Prerequisite: Permission of instructor.

Fall and spring, 1 credit

THR 116 Technical Production

Open to students selected as technical staff for departmental productions directed by a faculty member. May be repeated, but will count toward fulfillment of major requirements only once.

Prerequisite: THR 132.

Fall and spring, 1 credit

THR 130 Basic Voice Training for Actors

This basic course deals with the proper use of the voice in the making of sheer sound. The vowels are used in varying patterns of pitch and intensity to increase the range, clarity and amplitude of the vocal tone. Students arrange weekly tutorials with instructor. Open only to those with a commitment to acting or other professions in which the speaking voice is of primary importance. May be repeated once but counts toward the major once only.

Prerequisite: Permission of instructor.

Fall and spring, 1 credit

R. Dyer-Bennet

THR 132 Fundamentals of Technical Theatre

The construction, painting and handling of stage scenery and properties, as well as basic electricity, stage lighting instruments and sound systems used in theatrical productions.

Fall and spring, 3 credits

THR 136 Acting I

The basic elements of the actor's craft. Stage movement, sense exercises, improvisation, characterization, mime, sight-reading and script analysis in order to stimulate creative imagination and emotional capacities.

Prerequisite: THR 101

Fall and spring, 3 credits

THR 137 Film Expression

An introduction to those formative means unique to film by which the director-author express ideas. Examples of the work of great directors from Griffith to Godard are viewed, analyzed and discussed. Narrative-dramatic film is emphasized, but Brakhage, Belson, Whitney and others are not ignored. A foundation for both future film critics and future film-makers. This course is required for admission to all other film courses.

Fall, 3 credits

R. Hartzell

THR 138 Movement as Medium

An introduction to the elements of movement—space, time, weight and energy—through improvisation. Structured exercise to encourage appropriate body functioning—balance, coordination, flexibility and articulateness.

Fall and spring, 3 credits

THR 140 Introduction to Television

How television works and an examination of the skills and techniques of the pro-

*See p. 75, Information About Course Credit.

professionals and craftsmen who make it work. Directors, writers, cameramen, performers, advertising agency people will be guest lecturers. Equipment and technique will be demonstrated but this is not a hands-on course. Broadcast television (both commercial and public) will be emphasized but cablevision, instructional TV, industrial training, experiments in community communication will also be examined.

Spring, 3 credits

R. Hartzell

THR 143 Stage Design I

An introduction to stage design. Fundamental techniques for preparing a set design: play analysis, groundplan, drafting, perspective drawing, rendering techniques and model building.

Fall, 3 credits

W. Groom

THR 150 Stage Costume

An introduction to the history of costume, with emphasis on the aesthetics of costume design and costume rendering techniques.

Fall and spring, 3 credits

W. Groom

THR 201, 202 Pro-Seminar

Survey of dramatic literature and theatre history from ancient Greece to the present. Special attention to philosophical, social, political concerns in the plays, and to the styles of theatre in which the plays were first staged. THR 201, Ancient Greek drama to 1660. THR 202, 1660 to the present.

Prerequisite: THR 101

Fall (201) and spring (202), 3 credits each semester.

J. Schechter

THR 230 Voice and Articulation

In the second stage of voice development, students who have made sufficient progress in THR 130 learn to articulate consonants without disturbing the primary affective sound-making function and

thus to speak with an increased range of pitch and dynamics.

Prerequisites: THR 130 and permission of instructor.

Fall and spring, 3 credits

R. Dyer-Bennet

THR 232 Advanced Technical Theatre

The examination and use of new materials which can be utilized in the construction of settings and props. Shop work on advanced construction techniques of scenery and props.

Prerequisites: THR 132, THR 143 and permission of instructor.

Fall, 3 credits

THR 234 The Moving Image

This first course in film-making technique requires students to explore the aesthetics of motion through the use of a movie camera and through the experience of combining moving images, by creative editing, into meaningful sequences.

Prerequisites: THR 137 and permission of instructor.

Spring, 3 credits

R. Hartzell

THR 237 Acting II

Continued training in basic techniques. Advanced work in character analysis and development. Emphasis is on scene study and introduction to styles of acting.

Prerequisite: THR 136.

Fall and spring, 3 credits

THR 238 Stage Lighting

Basic theories of stage lighting approached from a technical and an aesthetic viewpoint, leading to the practical planning of light plots for individual plays.

Prerequisite: THR 132.

Spring, 3 credits

THR 239 Directing I

An introduction to the work of the director in selecting and preparing the play for production. Problems of style, inter-

pretation and execution. The director's approach to the actor.

Prerequisites: THR 132, 136 and 237.

Fall, 3 credits

THR 243 Stage Design II

Principles of design for the theatre including color composition and rendering techniques. These techniques are related to the aesthetics both of dramatic composition and the flexibility of modern staging.

Prerequisites: THR 132 and 143.

Spring, 3 credits

W. Groom

THR 244 Summer Theatre Workshop

Students in this course, in addition to working with the instructor throughout the planning, preparation and execution of a summer stock series will assume key positions of responsibility such as stage manager, head technician, and principal acting roles. May be repeated. May count toward major for a maximum of 6 credits.

Prerequisite: Permission of Instructor.

Summer, 1-6 credits each session

T. Neumiller

THR 250 Stage Costume II

An advanced course in costume design involving play analysis, design and presentation techniques. Bi-weekly projects and critiques with special emphasis on historical research.

Prerequisite: THR 150.

Spring, 3 credits

W. Groom

THR 251 Mime I

A course in mime theory and history, with tutorial and practicum, available to beginning and continuing students interested in mime. Mime is used as a medium to explore further acting skills and further possibilities of performance in relationship to space.

Prerequisite: Permission of instructor.

Fall, 3 credits

T. Neumiller

THR 252 Film-Making Workshop I

Instruction in planning short films and experience in executing the plans. Students may make their own films or assist a more advanced film-maker according to the discretion of the instructor. Such technical skills (lighting, sound recording, editing) as are required by the films being made will be taught.

Prerequisites: THR 234 and permission of instructor.

Fall, 3 credits

R. Hartzell

THR 253 Theatre Management

A course in backstage theatre management. Includes analysis of the playscript to serve the physical production most efficiently; blueprint and light plot reading; making of properties.

Prerequisites: THR 132, 238 and permission of instructor.

Spring, 3 credits

L. Auerbach

THR 254 Asian Theatre

Theatre as an expression of Asian culture: emphasis on Japan. Special attention will be given to the Hindu/Buddhist tradition and its relationship to art.

Prerequisite: Permission of instructor.

Fall, 3 credits

W. Bruehl

THR 255 Improvisational Skills

Work will consist of workshop and discussion sessions during which students will drill in both verbal and non-verbal exercises and assorted theatre games leading to the development of improvisational skills for both single and group work. May be repeated once but only 3 credits may be applied to major requirements.

Prerequisite: Permission of instructor.

Spring, 3 credits

W. Bruehl

THR 257 Evolution of Modern Theatre and Drama

A critical seminar to examine the evolu-

ing forms of modern western drama and theatre.

Prerequisite: THR 101 or EGL 193 or equivalent.

Fall, 3 credits

W. Bruehl

THR 261 Movement for Actors

Application of movement concepts to acting problems. Awareness of the students' personal movement qualities, particularly in relation to characterization and interaction; the relationship of movement to voice and speech; to set, props and costume.

Prerequisites: THR 136 and permission of instructor.

Fall and spring, 3 credits

THR 322 Ensemble Acting

Development in work beyond the usual concentration of two actor scenes. Focus is upon five and six actor scenes, the problems involved in supporting ensemble scenes, the development of the "minor" character.

Prerequisites: THR 237 and permission of instructor.

Spring, 3 credits

T. Neumiller

THR 330 Interpreting and Acting With The Voice

In the third stage of vocal production the student learns to use the vocal function, acquired in THR 130 and 230, in the service of meaning. Having some basic control of his vocal instrument, the student begins to use it expressively.

Prerequisites: THR 230 and permission of instructor.

Fall and spring, 3 credits

R. Dyer-Bennet

THR 339 Directing II

Advanced students will apply the skills and techniques learned in Directing I to specific scenes.

Prerequisites: THR 239 and permission of instructor.

Spring, 3 credits

THR 351 Mime II

A continuation of the beginning mime course. More intensive work is spent on performance techniques, putting together mime pieces, considerations of mime costume and make-up, and if possible, actual performance.

Prerequisites: THR 251 and permission of instructor.

Spring, 3 credits

T. Neumiller

THR 352 Film-Making Workshop II

Continues instruction and practical experience in the planning and production of motion pictures. Whatever advanced technical skills are required by the films produced will be taught; 16mm equipment will be used.

Prerequisites: THR 234, 252, and permission of instructor.

Spring, 3 credits

R. Hartzell

THR 353 Writing for Stage, Screen and Television

A workshop devoted to planning and writing finished scripts for stage, screen and television. Students will write original material for possible production in film and theatre workshops. May be repeated once, but only 3 credits may be applied to major requirements.

Prerequisite: Permission of instructor through evaluation of student's written work.

Fall and spring, 3 credits

L. Peterson

THR 356 Topics in Dramaturgy

Techniques in the preparation of a play-script for stage production: includes intensive literary and historical studies of the script, its adaptations, translations and previous productions. May be repeated.

Prerequisite: Permission of instructor.

Spring, 3 credits

THR 357 Topics in the Dramatic Tradition

A seminar for students well acquainted with the western dramatic repertoire.

Each semester will be devoted to a different theme: e.g., the Oedipus myth from Sophocles to the 20th century. May be repeated.

Prerequisite: Permission of instructor.

Spring, 3 credits

THR 358 Topics in Popular Theatre

Study and analysis of various non-literary theatrical forms and traditions, with special emphasis on the history of popular entertainment. Included will be the mimetic tradition in ancient Greece and Rome, the Commedia dell'Arte, the burlesque tradition and the story of popular entertainment from the variety show to the beginnings of film. May be repeated.

Prerequisite: Permission of instructor.

Fall, 3 credits

THR 359 Topics in the History of the Theatre

Each semester will treat in depth a special topic to be announced. For example, special topics might be: The 19th Century British Theatre; The Theatre of Naturalism; Restoration Theatre. May be repeated.

Prerequisites: THR 201, 202.

Fall and spring, 3 credits

THR 360 The History of Directing

The evolving concept of "theatre directing" will be examined from the earliest periods to the present. Special attention will be paid to the modern period, when "the director" as an autonomous figure comes into being. The roles of such theorists and practitioners as Wagner, the Duke of Saxe-Meiningen, Stanislavski, Appia, Craig, Meyerhold, Reinhardt,

Brecht, Copeau, Artaud, Brook, Grotowski and Beck will be examined and evaluated.

Prerequisites: THR 201, 202 and permission of instructor.

Spring, 3 credits

THR 361 Choreography for the Theatre

Using movement composition to create or contribute to a theatrical experience. Students will compose movement pieces using such elements as different environments, scenes from plays, the audience, props, costumes, sound, speech and music.

Prerequisite: THR 138.

Spring, 3 credits

THR 362 Topics in Theory and Aesthetics of the Theatre

A detailed study of a specific theoretical or aesthetic problem. Topics might include such things as Current New York Theatre and Its Critics, and Satiric Performance from Aristophanes to Lenny Bruce. May be repeated.

Prerequisite: Permission of instructor.

Fall, 3 credits

J. Schechter

THR 363 Topics in Film History and Aesthetics

A detailed study of a particular period in the history of film (for example The Biograph Films of 1902—1908) or the history of the film of a particular nation, e.g., French, Russian, or German cinema. May be repeated.

Prerequisite: THR 137.

Fall and spring, 3 credits

Projects Courses

(Admission to these courses is by permission of departmental projects committee only.)

THR 390 Projects in Theatre Production

Intensive, individual work on a special topic related to theatre production. For example, the preparation and execution of a major role or the supervision of a

community theatre project. May be repeated.

Prerequisite: Permission of projects committee.

Fall and spring, 1 to 6 credits

THR 391 Projects in History, Dramatic Literature and Theory

Advanced, individual work on a specific problem related either to theatre history, dramatic literature or dramatic theory. May be repeated.

Prerequisite: Permission of projects committee.

Fall and spring, 1 to 6 credits

THR 392 Projects in Film

Advanced, individual work on a topic related to film, resulting either in a scholarly paper or film footage. May be repeated.

Prerequisite: Permission of projects committee.

Fall and spring, 1 to 6 credits

R. Hartzell.

THR 393 Projects in Script Writing

Advanced, individual work resulting in a script for stage, screen or television. May be repeated.

Prerequisite: Permission of projects committee.

Fall and spring, 1 to 6 credits

L. Peterson

Program in Youth and Community Studies

Chairman: Martin Timin

Faculty Advisory Committee: Social Work (*Community Representative*)—Andrew Casazza; Sociology—Norman Goodman; Philosophy—Patrick Heelan; Human Development and Psychiatry—Joseph Katz; Cooperative College Centers—Richard Robinson; Psychiatry—Stanley Yolles

Associate Professors: Richard Cummings (*Adjunct*), James J. Dahl (*Adjunct*), Leonard Guardino (*Adjunct*), Arthur Kunz (*Adjunct*), Eugene Jefferson (*Adjunct*), Joseph Maniscalco (*Adjunct*), Fred Rosenberg (*Adjunct*)

Lecturer: Leonard E. Mell

The major aims at providing an intrinsically valid education for students by closely relating academic disciplines to the experience, skills and involvement that can be acquired by studying and working in actual communities. It is expected that the major will help prepare students for a variety of human service occupation choices at the B.A. level (e.g., youth services, juvenile and criminal justice, government administration, counseling, cultural and recreational services); for entrance to masters degree programs in those same fields; for advanced degree programs in law, the social and behavioral sciences and humanities. The student will be assisted through intensive advisement

to develop an academic plan comprised of YCS program courses and other University courses and to explore occupational and professional choices. In University and community settings, the courses will draw on the resources of graduate students in the social sciences and humanities; community-based human services professionals; community residents from a range of racial, ethnic and social class backgrounds.

Requirements for the Major in Youth and Community Studies

In addition to the general University requirements for the Bachelor of Arts degree, the following requirements must be met for the major in youth and community studies:

A. Admittance to the major:

Any student wishing to major in Youth and Community Studies should apply to the program office.

B. Study within the area of the major:

	<i>Credits</i>
YCS 220 Experience of Community (twice)	8
YCS 230 Community Analysis (twice)	8
YCS 240 Project Planning	4
YCS 250 Project Implementation	4
YCS 260 Reflection on the Self (twice)	4
YCS 300 Integrating Thesis	4
YCS electives (which will include repetitions of some of the above)	8
	40

Note: Students may participate in the program for either two or three years (one of which must be the senior year). They will typically carry 20 credits in YCS courses for each academic year.

Students will be required to complete a second academic concentration, providing substantive knowledge of a different academic discipline and relatable in some way to community studies—e.g., organization theory, urban literature, ethnic history—and approved by the program director.

12
Total 52 credits

Courses*

YCS 220 The Experience of Community

This offering will focus on the experiential aspect of community life rather than on demographic or institutional aspects. The student's point of entry will be through actual living experiences in the community. Communities may be se-

lected from among a variety of social class, ethnic, racial or residential areas or from special kinds of communities: occupational, student (colleges), life style (e.g., communes). Students will maintain close contact with program faculty and students. Readings will focus on

*See p. 75, Information About Course Credit.

the social and cultural history of the people, their individual and social psychology, value systems. Community residents will be brought into the study, reading and discussion activities of the course. The student will be asked to utilize a chosen mode modeled on the social sciences, literature or media to interpret the community experience. Three hours of class and four hours of field study per week. Majors must take this course twice. May be repeated further with permission of program director. Prerequisites: Sophomore standing and permission of instructor.

Fall, 4 credits

YCS 230 Community Analysis

This offering involves the compilation and analysis of demographic and institutional data in a community. The purpose is to acquaint the student with the existence of an interaction among social, economic and political institutions in a community. Information for the community analysis is obtained through surveys, interviews and use of existing records and data. Public (e.g., schools, youth services) and private (e.g., businesses, voluntary associations) institutions will be studied. The analysis of the interaction among these formal and informal institutions will be integrated with readings in the social sciences to develop hypotheses about the various meanings and manifestations of "community." Three hours of class and four hours of field study per week. Majors must take this course twice. May be repeated further with permission of program director.

Prerequisites: Sophomore standing and permission of instructor.

Spring, 4 credits

YCS 240 Project Planning

This offering includes student participation in the design of a community based project (youth program, school, delinquency or drug prevention, old age, legal service, model cities, mental health, community theater, etc.). The collection of relevant data, the study of relevant research and evaluation techniques, readings on economic, political and social

factors in planning, readings in value systems underlying various forms of planning and in the history of planned and unplanned social change will be integrated in the project planning. The student will be learning about the perspectives of community residents for and/or with whom the planning is being done. Three hours of class and four hours of field study per week. May be repeated with permission of program director.

Prerequisites: Sophomore standing and permission of instructor.

Fall, 4 credits

YCS 250 Project Implementation

The purpose of this offering is to give the student working experience in the implementation of a project or community service (youth school, delinquency or drug prevention, old age, legal service, model cities, mental health, community theatre, etc.). Service skills in interviewing counseling, community organization, group work will be developed. Readings in community life styles, program evaluation, service skills, specialized service delivery (e.g., youth, mental health), lay participation in service delivery, political and economic factors in service delivery will be integrated in the project implementation work. Three hours of class and four hours of field study per week. May be repeated with permission of program director.

Prerequisites: Sophomore standing and permission of instructor.

Spring, 4 credits

YCS 260 Reflection on the Self

The purpose of this seminar is to develop in the student some disciplined form, communicable to others, of self-reflection. As a foundation for this communication, the student will be encouraged to keep a daily log of activities, experiences, reactions. Forms of self-reflection in psychology, philosophy, literature and media will be considered to assist the student in structuring his or her personal reflection among students and faculty around ideas and experiences generated in the program. Three hours per week. Majors must take this

course twice. May be repeated further with permission of program director.

Prerequisites: Sophomore standing and permission of instructor.

Fall and spring, 2 credits

YCS 290 Occupational Study and Practice

Through surveys, studies, internships, work experiences, apprenticeships or informal association, the student will explore the content and style of a chosen profession or occupation. The student will prepare a paper he or she has been exposed to and place it in the context of the history of that occupation and the major issues—in the professional literature, media, practitioner and consumer opinion—that are current in the occupation.

Prerequisites: Upper division standing and permission of instructor.

Fall and spring, 3-6 credits

YCS 300 Integrating Thesis

The senior thesis will relate a major

theme of the student's second academic concentration to a chosen aspect of his or her work in Youth and Community Studies. Of particular importance will be the discussion of relationships among theoretical, technical, existential and practice aspects of the Community Studies and second concentration. The student will be required to write a thesis integrating the second academic concentration to the Youth and Community Studies curriculum.

Prerequisites: Senior YCS major and permission of instructor.

Fall and spring, 4 credits

YCS 310 Integrating Seminar

Faculty or student initiated seminars to discuss common concerns generated by the students' integrating papers or by similar faculty efforts. The seminar will invite scholars from Stony Brook and other universities and relevant community residents to give presentations.

Prerequisites: Senior YCS major, YCS 300, and permission of instructor.

Spring, 4 credits

W. Averell Harriman College For Urban and Policy Sciences

Professor: Robert Nathans (*Chairman*)

Associate Professors: Stanley M. Altman, Lawrence D. Bodin, T. Owen Carroll, Harry Weiner (*Director of Education*), Dennis Young

Assistant Professors: Andy Kydes (*Visiting*), Donald Rosenfield, David H. Swinton

The W. Averell Harriman College for Urban and Policy Sciences offers professional training for positions in government agencies at the federal, state, and local levels and for positions in the private sector that relate to public policy. Its Accelerated Program is open to students who have, during their freshman and sophomore years, demonstrated both an interest in public service careers and an aptitude for quantitative analysis. Graduates work as budget analysts, planners, managers, project leaders, and consultants in agencies dealing with public problems such as energy, transportation, criminal justice, science and technology, health, education, etc. The B.A. and the M.S. are earned at the end of the third year. In the final year, the student specializes in one of the following four tracks: planning, comprehensive management sciences, public policy analysis, government organization and management.

Information can be obtained from the Director of Education of the College, Room 314, Old Physics Building, Stony Brook, N.Y. 11794.

Courses

UPS 311, 312 Introduction to Urban and Policy Sciences

This course covers four related topics, which are not separable, nor can they be taken as individual courses. The top-

ics are: *Economic Analysis*—a half-dozen problems in public policy (health, transportation, housing, energy, criminal justice, food) are examined with a view toward outlining the utility of eco-

conomic theory in approaching such problems. The objective is to prepare the student for later examination of the corpus of neo-classical economic theory and the extraction therefrom of tools for problem-solving. *Administration* — personnel, information, and control systems are described with a view toward preparing the student for internships in large organizations. Where to look for evidences of pathology in an organization is a main question. *Quantitative Methods*—basic mathematical and computational skills required by the urban analyst are studied. These include an introduction to the FORTRAN language as well as an introduction to linear algebra, differential and integral calculus. Practical problems involving the analysis of data will be used to familiarize the student with existing software at the computing facilities. *Case Studies*—formal analyses are studied, particularly those on which important public policy decisions have been based (the Coleman report, the Fleischmann report on educational financing, the Carnegie Commission report on public television, the Civil Rights Commission reports on equal opportunity, etc.) with a view toward identifying their theoretical underpinnings.

Prerequisite: Permission of Director of Education.

Fall and spring, 12 credits each semester

UPS 331 Intermediate Economics for Public Policy Analysis

An intermediate level course on economics theory and analysis for public policy. The course gives a treatment of welfare and efficiency implications of decentralized economies under various degrees of competition; discusses welfare economies; develops the rationale for public activity in a decentralized economic system and the concepts of consumer's surplus, public goods, externalities; considers the treatment of the distributional implications of public decisions; discusses pricing and output policies for government industries and finance and its effect on the economy.

Prerequisites: UPS 311, 312 or equivalent.

Fall, 3 credits

UPS 341 Case Studies in Public Sector Analysis

Case Studies of public sector problems. Emphasis is placed upon developing the student's ability to organize unstructured problems for systematic analysis and to evaluate public policy alternatives. Areas of study will be selected from rental housing, higher education finance, federal assistance/training programs, such as Job Corps, Family Assistance Plan and others.

Prerequisites: UPS 311, 312 or equivalent.

Fall, 3 credits

College of Engineering And Applied Sciences

Programs in Engineering and Applied Sciences

Technology is now being asked nationally to provide help in far-reaching social problems: transportation, urban development, environmental improvement, health services and education. In parallel, engineers must contribute to the improvement of the quality of life in the developing nations. In all of these endeavors, the engineering problems are intimately related to the social, economic and political aspects. Consequently, the engineering program at Stony Brook emphasizes the development of educational experiences in not only the engineering areas, but also the underlying natural sciences, the related social and behavioral sciences and the humanities.

In order to realize these objectives, the engineering curriculum is much more flexible than at many engineering schools. The student may specialize in a particular field such as electrical, mechanical or materials engineering, as well as applied mathematics and computer science; he may plan an interdisciplinary program, specifically adapted to his career goals, involving other departments or divisions of the University; he may choose a program of breadth, as preparation for later specialization in architecture, business, law, or medicine. In all of these paths there is strong emphasis on individual projects in the junior and senior years when students are encouraged to work closely with members of the faculty on projects of interest to them.

The College of Engineering and Applied Sciences offers five different degree programs:

Bachelor of Science in:

- Applied Mathematics and Statistics
- Computer Science

Bachelor of Engineering in:

- Engineering Science
- Electrical Engineering
- Mechanical Engineering

Each upper division student is enrolled in one of these five programs. There is, in addition, great flexibility for specialization toward desired careers because of the freedom provided by electives within any of the five programs. Thus, the student may decide to emphasize:

Computer Engineering within either computer science or electrical engineering (suggested courses are described under these departments)

Ocean Engineering (courses ESI 280, ESC 330, and ESC 372 are appropriate, with courses selected from other parts of the university as well)

Materials Science within engineering science by choice of electives offered by the Department of Materials Science, or within the mechanical engineering program.

In addition, the engineering student often prepares for graduate studies in architecture, business, law or medicine. Interested students should consult the appropriate faculty advisor for each profession:

Architecture:	Prof. Edward E. O'Brien
Law:	Prof. Sheldon S. L. Chang
Medicine:	Dean Velio A. Marsocci

Industrial Management/Pre-Business: Students interested in pursuing careers in management or in continuing on to a graduate degree in business administration are advised to take the following sequence of elective courses:

ECO 101	Introduction to Economics
ECO 263	Managerial Accounting
ESI 290	Engineering and Managerial Economics
MSA 250	Introduction to Mathematical Statistics
MSA 325	Introduction to Operations Research

The above course sequence is suggestive. Substitutions as well as additional courses should be chosen in consultation with the advisor, Sumner N. Levine.

Two Baccalaureate Degrees

Qualified students whose special interests and career plans make such study appropriate may be granted permission to earn two degrees at the undergraduate level by planning a program which leads to a Bachelor of Engineering degree from the College of Engineering and Applied Sciences and a Bachelor of Arts or a Bachelor of Science degree from the College of Arts and Sciences. Written approval to undertake this curriculum must be obtained from the Dean of the College of Engineering and Applied Sciences and the Undergraduate Studies Office, subject to review and final authorization by the Academic Vice President. In addition to meeting all general University requirements, the candidate for two degrees must earn a total of 144 credits and must fulfill the requirements of the undergraduate program in engineering in the College of Engineering and Applied Sciences and the requirements of an established degree program in the College of Arts and Sciences.

BE/MS Program:

An engineering student may apply for admission to enter this special program which will lead to a Master of Science and a Bachelor of Engineering degree at the end of his fifth year. A student in the program takes, in his senior year, 3 credits of research which replace 4 credits of ESG 341, and 3 credits of a graduate course. In his 5th year the student will take 24 graduate credits, of which at least 15 credits are course work and 6 credits are research. The advantages of this program over the regular M.S. program are that a student may start his M.S. thesis in his senior year, and that he needs only 24 credits in his fifth year as opposed to 30 credits for a regular M.S. student.

Independent Study Projects (ESI 200)

An engineering student may, in consultation with faculty members, develop an individual course of academic investigation and study. The student must prepare an outline of the proposed project, clearly stating its scope and intent, and methods which will be used to conduct it. He must obtain from two faculty members written approval of the project and agreement to supervise it and to recommend appropriate academic credit. The project then requires final approval by the undergraduate academic affairs committee of the College of Engineering and Applied Sciences.

The maximum allowable total credit for independent study is 30 credits with no more than 18 credits in any one semester. Though independent study may be taken in any semester, it is normally expected that an engineering student will take independent study as a junior or senior. The academic credit assigned to independent study projects is normally drawn from the block of elective credits and engineering design in the curriculum.

Pass/No Credit Option

The only courses which may be taken on a Pass/No Credit option basis for the Bachelor of Engineering degree are those fulfilling the arts and humanities, social and behavioral sciences, technical elective, and open elective requirements.

Degree Requirements

All candidates for the Bachelor of Engineering and the Bachelor of Science degree must satisfy the following general university requirements, normally by attaining a passing grade in appropriate courses. Exemption and/or semester hour credit may be earned by passing special examinations.*

*See information on advanced placement and the Challenge Program examinations as a means of earning semester hour credit toward graduation, page 42 this *Bulletin*.

I. General University Requirements

Credits

A. *Proficiency in English Composition:*

All entering students are expected to demonstrate competence in the clear and logical expression of ideas in written English. This requirement may be met by passing the English proficiency examination or by completing EGL 101 English Composition

3

B. *Natural Sciences and Mathematics:*

Two semester courses, to be chosen from among the offerings of the following departments or divisions: biological sciences, chemistry, earth and space sciences, engineering, mathematical sciences and physics See Roman numeral II

Note: Not acceptable to satisfy the natural sciences and mathematics requirements are the following courses in mathematical sciences: MSM 101, 102 and in engineering: ESI 098, 100, 190, 191, 200.

C. *Social and Behavioral Sciences:*

Two semester courses, to be chosen from among the offerings of the following departments or interdisciplinary programs: Africana studies,** anthropology, Asian studies, economics, education, history, Ibero-American studies, linguistics, political science, psychology, Puerto Rican studies,** social sciences interdisciplinary program and sociology. (Student teaching courses may not be used to meet this requirement)

6-8

D. *Arts and Humanities:*

Two semester courses to be chosen from among the offerings of the following departments or interdisciplinary programs: Africana studies,** art, Chinese, classics and classical languages, comparative literature, English, French, Germanic and Slavic languages, Hebrew, Hispanic languages, Italian, music, philosophy, religious studies, and theatre arts

6-8

Note: Not acceptable to satisfy the arts and humanities requirements are the following courses:

1. Art: the first two semesters of the studio courses ART 111, 112, 255, 256.
2. English courses EGL 101, 102, 107, 108.
3. Foreign language courses below the intermediate, i.e., second year, level.
4. Music: performance or studio courses MUS 114, 115, 116, 151 and the first two semesters of MUS 161-199 and MUS 261-299.
5. Theatre Arts courses: THR 114, 116, 130, 230.

**Appropriate choices are identified in lists heading the section of the *Bulletin* where the courses are described.

E. *Residence Requirement*

In order to obtain a baccalaureate degree from Stony Brook, students must have completed at least 120 credit hours of passing work, including at least 36 credits earned at Stony Brook after achieving upper division status (57 earned credit hours).

F. *Academic Standing:*

For graduation, students must have attained a minimum cumulative grade point average of 2.00, i.e., C-level, after achieving upper division status.

Students should complete the above requirements A through D as early in their programs as possible, ordinarily within the freshman year, and *must* complete EGL 101 during that period. Exemption from any of the course requirements under A through D may be granted upon recommendation of the department or other agency supervising the course.

II. Program Requirements

A. All candidates for the Bachelor of Science degree must satisfy, in addition to I. above, the program requirements for one of the following:

Applied Mathematics and Statistics on page 308,
Computer Science on page 313.

B. All candidates for the Bachelor of Engineering degree must satisfy, in addition to I. above, the program requirements for one of the following:

Engineering Science on page 325
Electrical Engineering on page 318
Mechanical Engineering on page 332

Exemptions

A student can gain an exemption from any of the course requirements specified in section II.B. above by submitting a petition together with supporting material to the College of Engineering and Applied Sciences undergraduate academic affairs committee and getting committee approval.

A student can gain an exemption from a required engineering course by petitioning the College of Engineering and Applied Sciences undergraduate academic affairs committee and by arranging with the current instructor to take a comprehensive examination (e.g., the final examination) along with enrolled students. The results of the examination and their evaluation, submitted by the instructor, together with any other supporting material submitted by the student, will provide the basis for the undergraduate academic affairs committee's decision.

Courses of Instruction

Course designations are abbreviated according to the following scheme:

ESG: Engineering science courses. ESG also designates the undergraduate engineering major.

ESE: Courses offered by the Department of Electrical Sciences.

ESM: Courses offered by the Department of Materials Science.

ESC: Courses offered by the Department of Mechanical Engineering.

ESI: Interdepartmental courses offered by the College of Engineering and Applied Sciences.

MSA: Courses offered by the Department of Applied Mathematics and Statistics. MSA also designates the undergraduate applied mathematics major.

MSC: Courses offered by the Department of Computer Science. MSC also designates the undergraduate computer science major.

Courses are numbered in accordance with the following general pattern:

101-199 freshman-sophomore courses

200-399 juniors-senior courses

500-699 graduate courses

Courses

Engineering Science Courses

ESG 111 Engineering Laboratory I: Electrical Circuits and Electronics

Introduction to the measurement of electrical quantities; instrumentation; basic circuits, their operation and applications; electronic devices; amplifiers, oscillators, power supplies, wave shaping circuits and basic switching circuits.

Corequisite: ESG 171.

Spring, 2 credits

ESG 161 Particle and Rigid Body Mechanics

A review of vector algebra and calculus with kinematic applications such as curves in space, displacement, velocity and acceleration of point particles in classical orthogonal coordinate systems; notion of force; statics of a single particle including gravity, friction, electrostatic and magnetostatic forces; force as a vector field; moment about a point and moment about a line, couples, work; equivalent force systems and the wrench; equilibrium of systems of mass particles; special case of the rigid body. Rigid body kinematics and the kine-

matics of relative motions; single particle dynamics, including charge carrying particles and elementary linear vibrations; dynamics of clusters of particles; dynamics of the rigid body.

Corequisite: MSM 153.

Fall, 4 credits

Mr. Harris

ESG 171 Electrical Sciences I

In this course, the efficient generation, storage and transmission of energy and information are used to motivate the student's introduction to the various fields of electrical sciences. Such topics as signal analysis, electrical measurements, Kirchhoffs laws, linear circuit analysis via Laplace transforms, semiconductor devices and basic electronic circuits are covered both from the theoretical and practical viewpoints. Computer-aided techniques are included. The material in this course is coordinated with the laboratory course ESG 111.

Prerequisites: MSM 153 and MSC 101.

Corequisite: ESG 111.

Spring, 4 credits

ESG 201 Thermodynamics

The absolute temperature and other thermodynamic variables, including the thermodynamic potentials, are used to describe systems in thermal equilibrium by considering their interrelationships as governed by the laws of classical thermodynamics. Applications to phase transformations, inert and chemically reacting multi-component systems, power cycles and engines are considered.

Prerequisite: MSM 153.

Fall, 4 credits

Mr. Berlad

ESG 202 Thermodynamics of Materials

The basic laws and concepts of thermodynamics are elucidated, and the important thermodynamic relationships systematically developed with reference to the behavior of materials. The thermodynamics of solids is discussed including the thermodynamics of solutions and the calculation of reaction free energies and equilibria in condensed phase reactions such as phase transformations, oxidation and diffusion.

Corequisite: MSM 153.

Fall, 4 credits

Mr. Seigle

**ESG 212 Engineering Laboratory II:
Theory and Measurement in
Engineering**

The following topics will be considered: interaction of theory and experimentation, formulation of the theory, theoretical planning of the experiment, uses of theory in design of experimental apparatus, methods of data analysis, experimental problems involving sensor readout systems and electronic instrumentation in scientific research.

Prerequisite: Junior standing.

Fall, 2 credits

Mr. Jona

**ESG 213 Engineering Experimentation:
Applied Mathematics and
Statistics****ESG 214 Engineering Experimentation:
Computer Science****ESG 215 Engineering Experimentation:
Electrical Sciences****ESG 216 Engineering Experimentation:
Materials Science****ESG 217 Engineering Experimentation:
Mechanics**

An independent project under faculty supervision which emphasizes the principles of experimental design and data evaluation. Projects will generally be undertaken by teams of two students from a selection of problems submitted by the engineering faculty or suggested by the student with faculty approval. Students should register for the one course number above that names their faculty project advisor's department.

Prerequisites: ESG 111, ESG 212.

Spring, 2 credits

Staff

**ESG 232 Materials Science I:
Structure and Properties of
Materials**

A study of the relationship between the structure and properties of engineering materials and the principles by which materials properties are controlled. The structure and structural imperfections in simple crystalline materials and the role which these factors play in defining electrical conductivity, chemical reactivity, strength and ductility are considered. The molecular structure of polymers is discussed and related to the behavior of plastics, rubbers and synthetic fibers. The principles of phase equilibria and phase transformations in multicomponent systems is developed. These principles are applied to the control of the properties of semiconductors, commercial plastics and engineering alloys by thermochemical treatment. Corrosion, oxidation and other deterioration processes are interpreted through the interaction of materials with their environment.

Prerequisites: CHE 101, 102 or CHE 103, 104.

Fall, 4 credits

Ms. Preece

**ESG 233 Materials Science II:
Electronic Properties**

After a review of quantum mechanics and atomic physics, the binding energy and electronic energy levels in molecules and solids are discussed. The free-electron theory of metals is introduced and applied to the quantitative treatment of a number of electron emission effects. The band theory of solids is developed quantitatively via the Kronig-Penney model and the transport properties of metals and semiconductors are discussed in detail. The physical principle of p-n junctions, transistors, tunnel diodes, etc. are explained. Fundamentals and applications of photoconductors, lasers, magnetic materials and superconductors are also discussed.

Prerequisites: PHY 151 or ESI 181 (ESG 232 is not a prerequisite).

Fall, 4 credits

Mr. Jona

ESG 263 Mechanics of Solids

An introduction to the mechanics of deformable solids used in engineering structures. Topics include: two-dimensional descriptions of stress; displacements and strain; elastic stress strain temperature relations; beam deformations due to bending and axial forces; statically indeterminate beams.

Prerequisite: ESG 161.

Corequisite: ESG 264 for ESG majors.

Fall, 2 credits

Mr. Tasi

**ESG 264 Introduction to Fluid
Mechanics**

This course discusses fundamental properties of fluids and their conservation laws in the context of applications to common engineering flows. Topics covered include hydrostatics, surface tension, dimensional analysis and dynamic similitude, Euler's equation, laminar and turbulent boundary layers, lubrication, drag on immersed bodies, open channel and pipe flows.

Corequisite: ESG 263 for ESG majors.

Fall, 2 credits

Mr. O'Brien

ESG 272 Electrical Sciences II

The basics of circuit theory, electronics and electromechanics are applied to the analysis of practical electrical systems. Introduction to linear amplifiers and their system requirements, switching devices, gates, memory devices and the design of digital logic circuits. The principles of electromechanics are reviewed and applied to the analysis of magnetic circuits, transformers, electromechanical transducers and rotating machines; introduction to the principles of feedback control.

Prerequisite: ESG 171.

Fall, 4 credits

Mr. Barry

ESG 340 Engineering Design I

Lectures by faculty and visitors on typical design problems encountered in engineering practice. During this semester each student will choose a senior design project for Engineering Design II. A preliminary design report is required.

Prerequisite: Senior standing.

Fall, 2 credits

Mr. Lee

ESG 341 Engineering Design II

Student groups carry out the detailed design of the senior projects chosen during the first semester. A final and detailed design report must be prepared.

Prerequisite: ESG 340.

Spring, 4 credits

**MSC 101 Introduction to Computer
Science**

An introduction to programming and the solution of problems by computational algorithms. Students will gain experience by designing programs to solve a variety of problems chosen from scientific and non-scientific applications.

Fall and spring, 3 credits

MSM 154 Mathematics for Engineers I

Partial derivatives and multiple integrals. Vector analysis, including theorems of Green, Gauss and Stokes. Introduction

to functions of a complex variable: Cauchy-Riemann equations. Cauchy's theorem, Taylor and Laurent series, calculus of residues.

Prerequisite: MSM 153.

Spring, 4 credits

MSI 155 Mathematics for Engineers II

Methods for the solution of the partial

differential equations of physics and engineering, including Fourier series and Fourier transforms. Introduction to numerical methods.

Prerequisite: MSM 154 or junior standing.

Fall, 4 credits

Interdepartmental Open Elective Courses

ESI 98 Engineering Fundamentals

Instruction in the material contained in one or more required courses in the engineering science program. To be eligible, a student must obtain the approval of the central advising office of the College of Engineering and of the chairman of the department to which the required course is assigned. (Normally a student may not receive credit in the same semester for both the required course and tutoring in material which is contained in it.) Grading is Pass/No Credit only and the course carries non-degree credit.

Fall and spring, variable up to 6 credits each semester, repetitive

Staff

fulfill the attendance requirements. In addition a formal, one hour, weekly discussion group will meet with the coordinator to discuss more fully some of the various aspects of modern engineering. Students will be required to submit a term paper on the specific area of engineering of their study and will be graded accordingly. Credit obtained may be applied toward the open elective requirement by an engineering student. Students may not register for both ESI 100 and ESI 101 during the same semester.

Fall, 2 credits

Mr. Herley

ESI 100 Engineering Orientation Seminar

One hour lecture each week by a speaker from outside or from the College of Engineering faculty. Topics will include all the various aspects of Engineering offered at Stony Brook. No reports are required. Grading is Pass/No Credit only, based on attendance, and the course may be taken up to three times. Credit obtained may be applied toward the open elective requirement by an engineering student. Students may not register for both ESI 100 and ESI 101 during the same semester.

Fall and spring, 1 credit, repetitive

Mr. Herley

ESI 181 An Engineering Introduction to the Solid State

The purpose of this course is to prepare students for the understanding of nature and properties of the crystalline solid state, with particular attention to semiconductors and semiconductor technology. Elementary notions of statistical and kinetic theory necessary for an understanding of the behavior of assemblies of particles are introduced. The basic concepts of oscillatory motions, wave-like phenomena and classical electricity and magnetism are reviewed. Elementary quantum mechanics is introduced and a few simple problems (harmonic oscillator, electron in a box) are solved. The theory is then applied to the hydrogen atom, multielectron conductors are described; the origin of energy bands and energy gaps is explained; concepts such as Fermi energy, density of states and work function are introduced; and, finally, the optical and

transport properties of metals, insulators and semiconductors are discussed.

Prerequisites: PHY 101 and PHY 102 are equivalent.

Fall, 4 credits

Mr. Jona

ESI 190 Man, Technology, and Society

For course description see Program on Technology and Society page

ESI 191 Introduction to Technology Assessment (Issues, Methods and Cases)

For course description see Program on Technology and Society page

ESI 194 Energy and Society

Comprehensive treatment of technology and economy of energy resources; conversion, transmission, and distribution of energy, interaction of energy problems with the home, community, nation, and the world. Student participation is required in the form of role-enacting and presentation of reports. Three hours of lecture per week. The course is primarily intended for non-engineering majors.

Spring, 3 credits

Mr. Chang

ESI 200 Independent Study Project

See page

Fall and spring, variable up to 18 credits each semester, repetitive

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ESI 205 Materials in the Modern World

For course description see Program on Technology and Society page.

ESI 210 Exploration of Space

For course description see Program on Technology and Society page.

ESI 220 Cybernetics

For course description see Program on Technology and Society page.

ESI 222 Environmental Pollution and its Control

For course description see Program on Technology and Society page.

Interdepartmental Technical Elective Courses

ESI 202 Computer Organization and Programming

Explores the physical structure of a computer, machine representation of information, assembly language programming, input and output communication; and introduces the student to systems programming techniques.

Prerequisite: MSC 101.

Fall and spring, 3 credits

ESI 280 Introduction to Ocean Engineering

A wide range of ocean and marine systems are examined from the technical viewpoint. These include transportation,

submersibles, navigation and control, structures, mining operation, fisheries and oceanography. Technologies specific to the ocean environment such as underwater sound, materials, global instrumentation and life support will be treated in sufficient detail to enable quantitative discussion of the role of ocean engineering and coastal zone operations.

Fall, 3 credits

Mr. Carleton

ESI 290 Engineering and Managerial Economics

The application of engineering involves at every turn careful consideration of

economic factors. The purpose of this course is to give the engineering student a sound introduction to the applications of economic and system analysis to decision-making problems arising in engineering and industry. Topics covered include nature of the business enterprise, cash flow and financial statement analysis, the cost of capital, economic life, taxes, analysis under risk and uncertainty, return on investment and the evaluation of engineering alternatives, budgeting techniques, inventory and critical path techniques, corporate financing and patent aspects of engineering.

Fall, 3 credits

Mr. Levine

ESI 291 Industrial Engineering

A broad introduction to the problems and techniques of industrial engineering including production design of products, process planning, layout of physical facilities, plant location, job design, pro-

duction standards, forecasting and inventories, quality control, automation techniques in production.

Spring, 3 credits

Mr. Levine

ESI 310 Biomedical Engineering

A systematic and basic development of the engineering principles applicable to medicine and biological systems in terms of the following basic disciplines: biological systems analysis, biomechanics (viscoelastic, rheological properties of tissues, stress distributions in living organisms, etc.), bioenergetics and radiation technology, mass and heat transport in living systems, bioelectronics and biomaterials sciences. Applications are provided to bioastronautics, artificial organs, environmental control, man-machine systems and the stimulation of biological systems.

3 credits

Mr. Braun

Department of Applied Mathematics and Statistics

Professors: Edward J. Beltrami (*Chairman*), Yung Ming Chen, Daniel Dicker, Vaclav J. Dolezal, Irving Gerst, F. James Rohlf (*Adjunct*), Hanan Selvin (*Adjunct*), Ram P. Srivastav, Reginald P. Tewarson, Armen H. Zemanian

Associate Professors: Woo Jong Kim, Martin A. Leibowitz (*Director of Undergraduate Studies*), Gary Simon, Alan Tucker

Visiting Associate Professor: James C. Frauenthal

Assistant Professors: Stephen Finch, William Yuan

The undergraduate program in Applied Mathematics and Statistics aims to give mathematically oriented students a liberal-arts education in quantitative problem-solving. The courses in this program survey a variety of mathematical theories that are commonly employed today by planners and researchers in government, industry, and science. While over half the applied math majors go to graduate school mainly in statistics, operations research, management science, and health sciences—the department has been careful to make sure that the

training its graduates receive is compatible with the changing mathematical needs for educational (secondary school) and industrial employers.

Although the department grew out of the Department of Applied Analysis in the College of Engineering, its undergraduate program emphasizes, as a result of student preference, mathematics related to computer science and the social sciences. The department does not have an Honors program or any specified tracks but relies instead on extensive personal advising to develop the right program for each student. The limited number of undergraduate courses offered serve as the nucleus for the varied individual programs of applied mathematics majors. These programs regularly include upper-division courses in Computer Science, Mathematics or Economics, or graduate-level applied math courses.

Requirements for the Major in Applied Mathematics and Statistics

In addition to the general University requirements for the Bachelor of Science degree, the following courses are required for the major in applied mathematics and statistics:

1. MSM 121, 122, 151, 152, or MSM 191, 192, 193, 194
2. MSC 101
3. Twenty-four additional credits in courses designated MSA or MSI and numbered 200 and above. (A maximum of six of these credits may be replaced by an equal number of credits to be taken from approved mathematically oriented courses numbered 200 and above. Typical approved substitutions are: MSC 201, MSM 211, ECO 215, 216, 321, PSY 381, 382, PHY 343, 344.)

Recommendations for Students Majoring in Applied Mathematics and Statistics

The department encourages students to have a broad exposure to many types of mathematical reasoning and to its diverse roles in the social and natural sciences. During their first two years, students considering an MSA major are encouraged to take, besides the required calculus sequence, some physics (either PHY 131, 132 or PHY 101, 102 or PHY 103, 104), MSC 101 and one other computer course (competence in computer programming is essential for many professional careers), and some economics. At the end of their sophomore year or beginning of their junior year, students begin taking upper-division MSA courses, usually starting with MSA 201 and 251. At the same time, they are strongly encouraged to continue taking MSM and MSC courses and mathematically oriented courses in other departments, such as ECO 215, PHY 343, UPS 320. For further details, potential majors should talk with the department's undergraduate program director.

Graduate courses in Applied Mathematics and Statistics are open to qualified undergraduates. Students are advised to consult the *Graduate Bulletin* and the faculty for further information.

Courses

MSA 101 Introduction to Finite Mathematics

This course concentrates on mathematical concepts and techniques which are needed for the mathematical models currently being used in such fields as anthropology, biology, economics, linguistics, psychology and sociology. Topics to be covered are finite probability theory (including Markov chains), matrix algebra, graph theory; applications to mathematical models in the biological and social sciences will be employed throughout. This course may not be taken by students should take MSA 110). Students may not receive credit for both MSA 101 and MSA 110.

Fall and spring, 3 credits

MSA 102 Elements of Statistics

The use and misuse of statistics in real-life situations; basic statistical measures of central tendency and of dispersion, frequency distributions, elements of probability, binomial and normal distributions, small- and large-sample hypothesis testing, confidence intervals, chi-square test and regression. This course may not be taken for credit by students with credit for MSM 151, MSA 250, MSA 251, PSY 162 or SOC 202. Students with a weak high school mathematics background should take MSA 101 first.

Fall and spring, 3 credits

MSA 104 Introduction to Probability

Introduction to continuous and discrete probability; basic properties of probability distributions, examples (from the physical sciences), expectations; binomial, Poisson, and normal distributions.

Prerequisite: MSM 121.

Corequisite: MSM 122.

Fall and spring, 1 credit

MSA 110 Introduction to Mathematical Modeling

Modeling techniques to be covered will include graph theory, difference equations, finite stochastic processes (including Markov chains) and elementary statistical sampling; necessary background in finite probability will be developed. This course is designed for two types of students: the biological or social science student who views mathematical modeling as a necessary tool for analyzing problems in his own discipline; and the mathematically oriented student for whom mathematical models serve as a motivated introduction to applicable areas of modern mathematics. Students considering a major in Applied Mathematics and Statistics are encouraged to take this course. Students may not receive credit for both MSA 110 and MSA 101.

Prerequisite: MSM 121.

MSA 145 Introduction to Biostatistics

Descriptive statistics; binomial, Poisson, and normal distributions; estimation; hypothesis testing; analysis of variance; regression; correlation. This course is designed for Biological Sciences majors and those planning graduate studies in medicine or public health.

Prerequisite: Completion of Biological Sciences mathematics requirements.

Spring, 3 credits

[MSI 155 Mathematics for Engineers II]

(See description under Interdepartmental Courses in Mathematical Sciences.)

MSA 201, 202 Finite Mathematical Structures I, II

This course introduces the student to graph theory and combinatorial analysis. The emphasis is on solving applied

problems rather than on theorems and proofs. Techniques used in problem-solving will include generating functions, recurrence relations and network flows. This course develops the type of mathematical thinking that is fundamental to computer science and operations research.

Corequisite: MSM 151.

Fall and spring, 3 credits each semester

[MSI 201, 202 Advanced Calculus for Scientists I, II]

(See description under Interdepartmental Courses in Mathematical Sciences.)

MSA 210 Operations Research I: Deterministic Models

This course presents linear programming with a view towards its uses in economics and systems analysis. Linear-algebra and geometric foundations of linear programming; simplex method and its variations; primal-dual programs; formulation and interpretation of linear programming models, including practical problems in transportation and production control. Optional computer projects.

Prerequisites: MSM 151 or MSM 153.

Each spring: 3 credits

MSA 220 Applied Differential Systems

Properties of ordinary differential equations with diverse applications to problems in the nature and social sciences. (No background in areas of application is required.) The course is designed for students in the mathematical sciences who are interested in basic uses of the calculus.

Prerequisite: MSM 151.

Fall, 3 credits

MSA 226 Numerical Analysis

Direct and indirect methods for the solution of linear and non-linear equations. Computation of eigenvalues and eigenvectors of matrices. Quadrature, differentiation and curve fitting. Numerical solution of ordinary and partial differential equations.

Fall, 3 credits

MSA 227 Approximation Theory

Smoothing of data, least squares methods, interpolation, polynomial approximation and quadrature formulas.

Prerequisite: MSM 152.

Spring, 3 credits

MSA 250 Introduction to Mathematical Statistics

Probability spaces, random variables, algebra of expectations, random sampling, law of large numbers, estimation of parameters, confidence intervals, regression, hypothesis testing. Students interested in probability theory and a more thorough treatment of statistical analysis should take MSA 251, 252. (MSA 250 may not be taken for credit in addition to MSA 252 or ECO 220.)

Prerequisite: MSM 122 or MSM 191.

Fall and spring, 3 credits

MSA 251, 252 Probability and Statistics I, II

Finite, discrete and continuous probability distributions; random variables; conditional probability; multivariate distributions; laws of large numbers; central limit theorem. Statistical application: random sampling, estimation, significance testing, hypothesis testing, regression correlation. Further topics. MSA 252 may not be taken for credit in addition to MSA 250 or ECO 220.

Prerequisite: MSM 122 or MSM 191.

Fall and spring, 3 credits each semester

MSA 301, 302 Principles and Techniques of Applied Mathematics I, II

Linear operators and spectral theory applied to differential operators. Eigenfunction expansions, Green's functions and distributions: integral transforms.

Prerequisites: MSM 152 and permission of instructor.

Fall and spring, 3 credits each semester.

Not offered 1976-77.

MSA 325 Operations Research II: Stochastic Models

Methods and techniques for stochastic

modeling and optimization, with applications to queueing theory, Markov chains, inventory theory, games and decisions. Prerequisites: MSA 250 or 251 and MSM 151.

Fall, 3 credits

MSA 331 Mathematical Models in the Social Sciences

About ten models are discussed in detail. These involve preference rankings, ecology of competing species, market stability, stabilization of money flow, conditioned conformity, population growth, organization theory and optimal scheduling.

Prerequisites: MSM 151 and MSA 250 or 251.

Spring, 3 credits

MSA 333 Mathematical Economics I

Application of set theory, metric spaces, and topology to the theory of consumer choice, utility and production; neo-classical demand and production theory; revealed preference and integrability; input-output models. The notions of set theory, metric spaces and topology will be developed as needed. This course is identical with ECO 331.

Prerequisites: MSM 152 and MSM 201.

Fall, 3 credits

MSA 334 Mathematical Economics II

Convex sets, functions, cones and fixed point theorems and their application to economics theory; general equilibrium theory; concept of N-person games applied to the core; Lyapunov stability in economics. This course is identical with ECO 332.

Prerequisite: MSA 333 or ECO 331 or permission of instructor.

Spring, 3 credits

MSA 351 Mathematical Models in the Physical Sciences I

Methods of mathematical modeling with particular emphasis given to such areas as particle mechanics, continuum mechanics and wave propagation. Topics chosen will depend on the background and interests of the class.

Prerequisite: MSI 202.

Fall, 3 credits. Not offered 1975-76; interested students should take PHY 343.

Staff

MSA 353 Regression Theory

Classical least squares theory for regression including the Gauss-Markov theorem and classical normal statistical theory. An introduction to stepwise regression procedures and exploratory data analysis techniques. Analysis of variance problems as a subset of regression. Brief discussions of robustness of estimation and robustness of design.

MSA 390 Research in Applied Mathematics

A course which will give the students an opportunity to be involved in an independent research project with supervision by the faculty. Permission to register will require that students have average grades of B in their courses and that they obtain the agreement of a faculty member to supervise their research. Prerequisite: Permission of instructor and department.

Fall and spring, 3 credits

Staff

Applied Mathematics and Statistics Courses Approved as Engineering Technical Electives

MSA 201, 202 Finite Mathematical Structures I, II

MSA 210 Introduction to Linear Programming

MSA 217 Ordinary Differential Equations

MSA 226 Numerical Analysis

MSA 227 *Approximation Theory*
MSA 250 *Introduction to Mathematical Statistics*
MSA 251, 252 *Probability and Statistics I, II*
MSA 301, 302 *Principles and Techniques of Applied Mathematics I, II*
MSA 316 *Mathematical Programming*
MSA 321 *Mathematics of Networks*

MSA 324 *Special Functions of Applied Mathematics*
MSA 325 *Introduction to Operations Research*
MSA 331 *Mathematical Models in the Social Sciences*
MSA 351, 352 *Mathematical Models in the Physical Sciences I, II*
MSA 371 *Optimization Theory*
MSA 390 *Research in Applied Mathematics*

Department of Computer Science

Professors: Arthur J. Bernstein (*Director of Undergraduate Studies*), Aaron Finerman (*Chairman*), Herbert L. Gelernter, Jack Heller, Richard B. Kieburz, David R. Smith, Daniel H. Tycko

Associate Professor: Yechezkel Zalcstein

Assistant Professors: Eralp Akkoyunlu, John C. Cherniavsky, Charles Fiduccia, Peter B. Henderson

Undergraduate Program in Computer Science

The undergraduate major in computer science is designed to combine a liberal arts program with sufficient pre-professional education in computer science to prepare the student for graduate study or for a career in the computing field. The intent is to offer the breadth of education which will enable students to place computing in the perspective of an extension of man's intellectual power, while offering the depth of education required to understand how to utilize the power of computing.

Students will learn concepts and skills needed for designing, programming and applying computer systems while learning the theoretical foundation of computer science. They will also have sufficient freedom in the program to pursue other academic interests in the liberal arts, sciences and engineering to complement their study of computer science. Many students will be able to utilize the flexibility of the program to satisfy the requirements of a second major for the baccalaureate degree.

Requirements for the Major in Computer Science

In addition to the general University requirements for the Bachelor of Science degree, the following courses are required for the major in computer science:

A. Required courses

1. MSC 101, 102 and three courses from among MSC 201, 205, 302, 303 and 304.

2. MSM 121, 122, 151 (or MSM 191, 192, 193) and MSM 211
3. MSA 201, 226 and 250 (or 251)
4. ESE 318

B. Additional requirements

To achieve the necessary breadth in various fields, a minimum of 12 additional credits shall be chosen from among the course offerings in the natural sciences (not including mathematics) and in engineering, and a minimum of 30 credits shall be chosen from among the course offerings in the social and behavioral sciences and in the arts and humanities. Courses in these categories may also be used to satisfy the general university requirement.

Suggestions for Elective Courses

Students are encouraged to concentrate their elective courses in no more than two disciplines chosen according to their secondary interests, so as to obtain depth in these areas. Students interested in the theory of computation are encouraged to take MSI 331 Logic. Those interested in computer hardware should consider ESE 346 Computer Communications. Other related courses can be found in the listings of the Departments of Mathematics, Applied Mathematics, Electrical Sciences and the Interdisciplinary Program in Linguistics. Students should consult with faculty member of the Department of Computer Science early in their career in planning their program.

Pass/No Credit Option

A student may, with permission of an advisor, register for a Pass/NC grade in any course not used to satisfy the requirements of A or B above.

Sample Program (required courses only)

<i>Freshman</i>	<i>Sophomore</i>	<i>Junior</i>	<i>Senior</i>
MSM 121	MSM 151	MSA 201	MSA 250
MSM 122	MSC 211	MSA 226	ESE 318
MSC 101	MSC 201	MSC 205*	MSC 302*
MSC 102			MSC 304*

Courses

MSC 100 The Societal Impact of Computers

A critical assessment of the role that computing and data processing play in contemporary society. Following an introduction to the information manage-

ment capabilities that automation can provide, a study will be made of economic, legal, and moral issues involved in the utilization of these capabilities.

Fall and spring, 3 credits

MSC 101 Introduction to Computer Science

An introduction to programming and the solution of problems by computational algorithms. Students will gain experience by designing programs to solve a variety of problems chosen from scientific and non-scientific applications.

Fall and spring, 3 credits

MSC 102 Computer Organization and Programming

Explores the physical structure of a computer, machine representation of information, assembly language programming, input and output communication, and introduces the student to systems programming techniques.

Prerequisite: MSC 101.

Fall and spring, 4 credits

MSC 201 Advanced Programming

Development of techniques in non-numeric programming with particular emphasis on data representation. Detailed treatment of recursive data structures, searching and sorting. Introduces concepts of modular design of programs, determination of program correctness, and analysis of execution efficiency.

Prerequisite: MSC 101.

Fall and spring, 3 credits

MSC 205 Introduction to Business Data Processing

A basic introduction to the techniques of business data processing applications using concepts of sequential and direct access storage mediums. Typical data processing problems in the commercial area will be considered using two most frequently used higher level languages: PL/1 and COBOL. Concepts of unified data base construction and maintenance will be considered from the viewpoint of management information systems.

Prerequisite: MSC 102 or MSC 201.

Fall, 3 credits

A. Finerman

MSC 301 Research in Computer Science

A course which involves the student in an independent research project with supervision by the faculty. Engineering students wishing to register must have an average grade of *B* in all engineering courses. Only three credits of research electives (MSA 390, MSC 301, ESE 301, ESM 301, ESC 301, UPS 301) may be counted towards fulfillment of technical elective requirements.

Prerequisites: Permission of instructor and department.

Fall and spring, 3 credits

MCS 302 Structure of Digital Computers

Design of computer sub-systems such as memories, storage devices, control units, input-output facilities and arithmetic units. Microprogramming and overall system design problems. Other advanced topics and alternative machine organization.

Prerequisite: MSC 102, ESE 318.

Spring, 3 credits

MSC 303 Introduction to the Theory of Computation

An introduction to the abstract notions encountered in machine computation. Topics include finite automata, regular expressions, and formal languages, with emphasis on regular and context-free grammars. Questions relating to what can and cannot be done by machines are covered by considering various models of computation, including Turing machines, recursive functions, and universal machines.

Prerequisites: MSC 102 and MSM 211.

Fall, 3 credits

C. Fiduccia

MSC 304 Introduction to Systems Programming

The course covers two major areas of systems programming, compilers and operating systems. Topics studied include formal description of programming languages, syntax analysis, code generation; interpreters, general resource allo-

cation; memory management, scheduling, and file management.

Prerequisites: MSC 102 and MSC 201.

Spring, 3 credits

D. Tycko

MSC 305 Advanced Business Data Processing

A continuation of MSC 205, Data processing applications in the commercial area will be considered using advanced features of the two frequently used higher level languages; PL/1 and COBOL. Concepts of unified data base construction and maintenance will be considered from the viewpoint of the use of sequential and direct access devices, construction of logically self-defining files, list structures on direct access devices, and hierarchical and network structures.

Prerequisite: MSC 205.

Spring, 3 credits

MSC 352 Heuristic Programming and the Simulation of Intelligent Behavior by Machine

Topics covered include: critique of artificial intelligence research; state-space problem representations and search algorithms; game playing programs; theorem-proving programs; programs for the study and simulation of cognitive processes and pattern recognition. Further topics in current research as time permits.

Prerequisites: MSC 201 and MSC 303, or permission of instructor.

Spring, 3 credits

H. Gelernter

Computer Science Courses Approved as Engineering Technical Electives

MSC 201 Advanced Programming

MSC 205 Introduction to Business Data Processing

MSC 301 Research in Computer Science

MSC 302 Structure of Digital Computers

MSC 303 Introduction to the Theory of Computation

MSC 304 Introduction to Systems Programming

Computer Engineering

More and more frequently the solution to current design problems in computers and data processing equipment lie in the area between strictly hardware or software solutions. It is important for students who wish to specialize in computer hardware to have a firm understanding of the capabilities and limitations of computer software as well as expertise in digital electronics. To meet this requirement the following sequence of courses is specified as fundamental:

ESG: 111, 171, 272; ESE: 316, 318, 330, 346

MSA: 201, 250 or 251; MSC: 201, 302, 304; MSM: 151/153

ESG: 340, 341 in which the student will be required to select a computer related project. This basic program can be merged with either (a) the engineering core, leading to a B.E. degree in electrical engineering or (b) the computer science major, leading to a B.S. degree with a computer engineering option.

The following sample program shows the above courses embedded in the requirements of (a) and (b) in correct sequence to satisfy all prerequisites, where * indicates a requirement of engineering only, and # indicates a requirement of computer science only. In addition to the basic courses, the student might also consider ESE 340, 347, 315, 311, MSC 352, 303, 205 as being relevant. In all cases the section of the catalog corresponding to the parent program should be consulted for their exact requirements.

Example Courses Sequence in Computer Engineering

	<i>Fall Credits</i>		<i>Spring Credits</i>
Freshman			
EGL 101	3	PHY 102	4
PHY 101	4	MSM 122	4
MSM 121	4	MSC 102	3
MSC 101	3	HUM/SOC elective	3
HUM/SOC elective	3	HUM/SOC elective	3
	—		—
	<i>Total</i> 17		<i>Total</i> 17
Sophomore			
CHE 101	4	ESG 111	2
CHE 105	1	ESG 171	4
ESG 161*	4	ESE 318	4
MSM 151/153*	3	MSC 201	3
HUM/SOC elective	3	MSM 211 # /MSM 154*	3
	—		—
	<i>Total</i> 15		<i>Total</i> 16
Junior			
ESG 212*	2	Technical elective	4
ESG 272	4	ESG 214*	2
MSA 201	3	ESE 316	3
MSA 226 #	3	MSC 304	3
MSA 250 or 251	3	HUM/SOC elective	3
	—		—
	<i>Total</i> 15		<i>Total</i> 15
Senior			
ESG 340	2	ESG 341	4
ESE 330	3	ESE 346	3
ESG 233*	3	MSC 302	3
Technical elective	3	Technical elective	3
HUM/SOC elective	3	Open elective	3
	—		—
	<i>Total</i> 17		<i>Total</i> 16

Department of Electrical Sciences

Professors: Ludwig Braun, Shelden S. L. Chang, Chi-Tsong Chen, Velio A. Marsocci, David R. Smith, George W. Stroke, Gary L. Thomas (*Chairman*), John G. Truxal

Associate Professors: Herbert R. Carelton, Peter M. Dollard, Stephen S. Rappaport, Hang-Sheng Tuan

Associate Professors: Patrick E. Barry, Shelly Harrison, Edward Lee, Kenneth L. Short, David A. Wayne

The Department of Electrical Sciences offers a set of programs with course offerings that span the subject matter of contemporary electrical engineering. Through the Department's offerings a student can develop the requisite background and skills suited to his own interests and career goals. While most of the electrical engineering students go into industry upon graduation many go directly to graduate school for further study in business or other professions. Many continue their education on a part-time basis. The programs described below have sufficient flexibility to meet a large variety of individual objectives.

Undergraduate Programs in Electrical Sciences

EE Program: Students interested in specializing in the area of electrical sciences may register, normally at the beginning of the junior year, in the Electrical Engineering Program. At the completion of the program, the student will receive the Bachelor of Engineering in Electrical Engineering degree. The program requires a minimum core of any five electives (excluding ESE 301) to be taken in the Electrical Sciences Department. In addition, Engineering Experimentation (ESG 215) and Engineering Design (ESG 340, 341) must be carried out under the supervision of the Electrical Sciences faculty, unless approved otherwise by the undergraduate committee. The core sequence selected, along with additional courses and technical electives are chosen in consultation with a faculty advisor, and taking into consideration the particular interest of the student. These will provide a thorough foundation fitted to individual goals.

Bachelor of Engineering Degree in Electrical Engineering

MINIMUM REQUIREMENTS

The minimum requirements for the Bachelor of Engineering Degree in Electrical Engineering are as follows:

Total credits—128 minimum

Credits

Humanities and Social Sciences 21

1. All students must demonstrate competence in the expression of ideas in written English. This requirement may be met by satisfactorily completing EGL 101 or the English proficiency exam.
2. At least 6 credits from the course offerings in Social and Behavioral Sciences.
3. At least 6 credits from the course offerings in Arts and Humanities.
4. At least 6 more credits from the course offerings in Social and Behavioral Sciences and/or Arts and Humanities.
5. At least 3 credits of 2, 3 or 4 above must be from an approved list of upper level courses.

Mathematics 17

MSM 121, 122, 153, 154 and one of MSI 155*, MSA 201, MSA 251

Natural Sciences 17 minimum

PHY 101, 102, CHE 101 and 105 or CHE 103 and 109, and one of (PHY 151, CHE 102 and CHE 104, MSC 102, or any BIO courses).

Computer Science 3 minimum

MSC 101

Engineering Sciences 20 minimum

ESG 171, 272, 111, 161, 212 and one of (ESG 202, 232, 233*)

Engineering Synthesis Design 8 minimum

ESG 215, ESG 340, ESG 341 (Projects to be carried out under the supervision of the faculty of Electrical Sciences unless approved otherwise by the undergraduate committee.

Engineering Specialization and Technical Elective 27 minimum

9 technical electives, 5 of which (excluding ESE 301; no more than 3 credits of ESE 390) must be chosen from the technical elective offerings of the Electrical Sciences Department.

Open Electives variable for a
ESI190* total of 128

Any undergraduate University course offered for academic credit may be chosen for open elective credits. No more than 3 credits of Physical Education can be used to satisfy open elective requirements. Graduate level courses may be taken to satisfy either open elective or technical elective requirements with approval.

*The courses denoted by the asterisk are recommended unless a more suitable course is chosen in consultation with a faculty advisor.

Example Course Sequence in Electrical Engineering

The following is an example course sequence. This sequence insures that prerequisite and corequisite courses are taken in proper order. NOTE: Elective courses must be chosen to satisfy minimum requirements for all B.E. Degree Programs.

	<i>Fall Credits</i>		<i>Spring Credits</i>
Freshman			
MSM 121 Calculus I	4	MSM 122 Calculus II	4
PHY 101 Gen. Physics I	4	PHY 102 Gen. Phys. II	4
EGL 101 Composition	4	MSC 101 Intro.	
ESI 190 Man, Technology, Society	3	to Comp. Sci.	3
HUM/SOC elective	3	HUM/SOC elective	3
	—		—
	<i>Total</i> 17		<i>Total</i> 17
Sophomore			
MSM 153 Calculus III		MSM 154 Multivar. Calc.	4
Differential Equations	3	ESG 111 Elec. Sci. Lab.	2
CHE 101/103 Chemistry+	4	ESG 171 Elec. Sci. I	4
CHE 105/109 Chem. Lab.+	1	HUM/SOC elective	3
Phy 151 Mod. Phys.	4	ESE 318 Digital Syst. Design	4
ESG 161 Part. & Rigid Body Mech.	4		
	—		—
	<i>Total</i> 16		<i>Total</i> 17
MSI 155 Math. for Engr.*	4	ESG 215 Eng. Expt.	2
ESG 212 Eng. Lab. II	2	ESE 315 Feedback Controls	3
ESG 272 Elec. Sci. II	4	ESE 311 Elec. Ckt Design	3
ESE 340 Basic Commun. Theory	3	HUM/SOC elective	3
ESE 319 Fields & Waves	3	Technical elective	3
	—	Open elective	3
	<i>Total</i> 16		<i>Total</i> 17
Senior			
ESG 233 Electronic Prop. of Mat.	4	ESG 341 Eng. Design II	4
ESG 340 Eng. Design I	2	Open elective	3
Technical Elective	3	HUM/SOC elective	3
Technical Elective	3	Technical elective	3
Open elective	3	Technical elective	3
	—		—
	<i>Total</i> 15		<i>Total</i> 16

*The courses denoted by the asterisk are recommended unless a more suitable course is chosen in consultation with a faculty advisor.

+ Can be taken instead in fall semester of first year.

Specialized Areas in Electrical Engineering

Some of the major areas of specialization are listed below. This list is not meant to be exhaustive. For more detailed information concerning additional areas and specific course recommendations students should consult "Undergraduates Guide to Electrical Engineering Program" which is available from the office of the Department of Electrical Sciences.

Biomedical Engineering
Communication and Information Sciences
Control and System Theory
Computer Engineering
Electrical Power Systems

BE/MS Program:

An engineering student may apply for admission to enter this special B.E.M.S. program which will lead to a Master of Science and a Bachelor of Engineering degree (either in Electrical Engineering or Engineering Science) at the end of his fifth year. A student in the program takes, in his senior year, 3 credits of ESE 599 which replaces 4 credits of ESG 341, and 3 credits of a graduate course. In his 5th year the student will take 24 graduate credits, of which at least 15 credits are course work and 6 credits are ESE 599. The advantages of this program over the regular M.S. program are that a student may start his M.S. thesis in his senior year, and that he needs only 24 credits in his fifth year as opposed to 30 credits for a regular M.S. student.

Courses

Departmental Technical Electives

ESE 301 Research in Electrical Sciences

A course which involves the student in an independent research project with supervision by the faculty. Permission to register will require that the student have an average grade of B in all engineering courses and the agreement of a faculty member to supervise the research. Only three credits of research electives (MSA 390, MSC 301, ESE 301, ESC 301, ESM 301) may be counted towards fulfillment of technical elective requirements.

Fall and spring, 3 credits, repetitive

ESE 303 Electronic Circuits and Instrumentation

A course which presents the elements of electronic circuitry and instrumentation at an introductory level. Operation of electronic devices. Operational aspects of power supplies, amplifiers, oscillators and logic circuits. Application to instrumentation; television, radio, audio amplifiers and recorders. A discussion of the new advances in electronic devices and circuits. This course is designed primarily for non-electrical engineering students.

Prerequisite: PHY 101, 102 or permission of instructor.

Fall, 3 credits

ESE 304 Electronic Instrumentation Engineering

The design of electronic instrumentation. Structure of basic measurement systems, transducers, analog signal conditioning with operational amplifiers, sampling, multiplexing, A/D and D/A conversion; digital signal conditioning, data input and display, automated measurement systems. Application of measurement systems to pollution, biomedical and industrial monitoring will be considered.

Prerequisite: ESG 272.

Fall, 3 credits

ESE 310 Modern Circuit Theory

Matrix representation of circuits. Applications to filter and transmission lines and coaxial cables. The concepts of linearity and reciprocity. Network theorems. Stability of active circuits. Transient response. Nonlinear and time varying circuits. State variable representation.

Prerequisite: ESG 171.

3 credits

ESE 311 Electronics Circuits Design

Engineering design concepts applied to electronic circuits. Basic network concepts, computational analysis and design techniques. Models of electronic devices. Biasing and compensation methods. Amplifiers and filters designed by conventional and by computer-aided techniques.

Prerequisite: ESG 272.

Spring, 3 credits

ESE 316 Digital Devices and Circuits

Switching characteristics of devices: Bipolar transistors, MOSFET's, C.C.D.'s. Circuit analysis of leading IC gate technologies: TTL, ECL, MOS, CMOS, dynamic MOS. Interfacing logic families. Application of small scale IC's in control and timing circuits. Large scale integrated circuits: organization and characteristics of R.A.M.S., ROM's and PLA's. Optoelectrical devices. A small number of laboratory sessions included.

Prerequisite: ESG 272.

Fall, 3 credits

ESE 318 Digital Systems Design

A course intended to be of use to non-

specialists, and in addition, to be part of the digital circuits and systems sequence. Starts from a description of digital circuits regarded as functional blocks and leads to a consideration of the logical design of combinational and sequential digital systems. Presented from an applied point of view, utilizing demonstrations and laboratory experiments. Topics include: binary representation of information, gate types, combinational circuit design, counters, registers, arithmetic circuits, sequential circuit design, and programmed logic.

Fall and spring, 4 credits

ESE 319 Introduction to Electromagnetic Fields and Waves

Fundamental experimental results of electromagnetism. Mathematical formulation of integral laws and derivation and physical interpretation of differential Maxwell equations in free space. Interaction of electromagnetic sources and fields; engineering applications. Electromagnetic energy and power. Generation of electromagnetic fields and waves in unbounded media by known sources. Simple antenna theory.

Fall, 3 credits

ESE 320 Electromagnetic Waves and Antennas

Fundamentals of wave propagation and antenna theory. Propagation of electromagnetic waves in free space and dielectrics. Wave propagation in anisotropic media. Guided electromagnetic waves and surface waves. Resonant cavities and optical resonators. Electromagnetic radiation and antennas.

Prerequisite: ESE 319.

Spring, 3 credits

ESE 323 Integrated and Fiber Optics

The course includes the following topics: thin film dielectric optical waveguides and modes, dielectric fibers, semiconductor planar waveguides, input and output couplers, groove reflectors, resonators and filters, modulators and detectors, semiconductor junction lasers and thin

film feedback lasers, fabrication techniques of thin film guides and devices, optical communication system considerations and requirements.

Prerequisite: ESE 319.

Fall, 3 credits

ESE 330 Integrated Electronics

An introduction to semiconductor electronics leading to the characterization of various passive and active devices, with emphasis on integrated electronic structures. Theory of p-n junction transistors; device design techniques; the applications of these devices in active networks; operation principles of analog circuits.

Prerequisite: ESG 272.

Fall, 3 credits

ESE 331 Physical Electronics

A study of the physical principles involved in the operation of electronic devices such as bipolar transistors, field effect transistors, lasers, superconducting and magnetic devices.

Prerequisites: PHY 151, ESG 171.

Fall, 3 credits

ESE 332 Lasers and Optical Electronics

Basic radiation theory, Gaussian beams, optical resonators. Interaction of radiation and atomic systems, theory of laser oscillation. Investigation of specific solid, gas and semiconductor lasers. Parametrics and second harmonic generation. Modulation and detection of optical radiation. Noise processes in optical generation and detection.

ESE 333 Lasers Technology and Utilization

The course reviews briefly the fundamentals of laser theory, and then addresses itself in its main part to the various types of lasers both from the point of view of theory as well as of construction and design. Singled out are lasers which have found their most widespread application in areas ranging from engineering measurements and physics (including spectroscopy) to applications

in optical image processing, in astronomy, as well as the use of lasers in many different areas of medicine and biology among others. Appropriate mathematical background is introduced in course.

Prerequisites: ESG 171 and ESG 272.

Spring, 3 credits

ESE 340 Basic Communication Theory

Basic concepts in both analog and digital data communications. Signals, spectra and linear networks. Fourier transforms, energy and power spectra, filtering. Amplitude, frequency, phase and pulse modulation schemes. Time and frequency multiplexing. Discussion of problems encountered in practice. Noise and bandwidth considerations. Data transmission. Simple error-checking codes.

Fall, 3 credits

ESE 341 Information Theory and Coding

Statistical characteristic of languages, information sources as random processes, measurement of information, noiseless coding; the binary symmetric channel and other digital channels; channel capacity; introduction to algebraic coding, theory for noisy channels, communication with feedback.

Prerequisite: ESG 171.

Spring, 3 credits

ESE 346 Computer Communication

Types of computer communication networks. Concepts of line capacity, modems, multiplexers and concentrators, synchronous and asynchronous transmission, buffering. Message statistics and topological optimization of network. Network reliability and message reliability. Introduction to information theory and coding, feedback and failsafe systems. Communication processors and software.

Prerequisites: Senior level competence in Engineering, Computer Science, or Applied Mathematics.

Spring, 3 credits

ESE 347 Digital Signal Processing

This course covers the following main

topics: Sampling and reconstructing of signals, z-transform, fast Fourier transform and its implementation and application. Design of finite-impulse-response (IIR) filter and optimal filters. Realization problems. Effects and analysis of quantization errors. Power spectrum analysis.

Fall, 3 credits

ESE 348 The Computer as a Laboratory Instrument

Computer-system architecture and design philosophy described in lectures, and laboratory experiments demonstrate basic principles of real-time measurement, control, and computation. Role of computer as dedicated system component in data acquisition, control, automated testing, real time transforms, and signal processing is developed by "hand on" experiments.

Spring, 1975

Prerequisites: ESE 318 or permission of the instructor E. T. Lee.

ESE 350 Electrical Power Systems

The course presents fundamental engineering theory for the design and operation of a modern electric power system. Modern aspects of generation, transmission and distribution will be considered with appropriate inspection trips to examine examples of these facilities. The relationship between the facilities and their influence on our environment will be reviewed. Topics included are: power system fundamentals, characteristics of transmission lines, generalized circuit constants, transformers, control of power flow and of voltage, per units system of computation, system stability, extra-high voltage a.c. and d.c. transmission.

Prerequisite: Junior or senior engineering majors; senior non-engineering majors with permission of instructor.

Spring, 3 credits

ESE 351 Energy Conversion

Natural and secondary energy sources. Methods of energy conversion including thermionic, thermoelectric and magneto-hydrodynamic converters, fuel cells and solar cells.

Prerequisite: ESG 201.

Spring, 3 credits

ESE 352 Electromechanical Energy Converters

Basic principles of energy conversion. D.C., induction, and synchronous rotary converters. The three phase system and symmetrical components. The relationships between voltage, current, flux and m.m.f. Equivalent circuits and operating characteristics of rotary converters. Analysis of saturation effects.

Prerequisite: ESG 272.

Fall, 3 credits

ESE 360 Optical Information Processing I

A course introducing the field of modern image processing and optical computing, together with all required mathematics. Particular emphasis is placed on generally applicable fundamentals and on the principles of experimental implementations. The theory is developed and illustrated with examples drawn from the most recent applications, including holography (3-D laser imaging), optical pattern recognition, image deblurring, holographic interferometry (vibration and stress analysis), information storage and retrieval, optical memories. Electron microscopy, microwave, radar, X-ray and ultrasonic imaging, including medical applications are discussed. All the necessary fundamentals of modern optics are introduced at appropriate times throughout the course.

Fall, 3 credits

ESE 361 Optical Information Processing II

The field of modern image processing and optical computing together with all required mathematics, including additional fundamentals and ramifications based on the material presented in ESE 360.

Spring, 3 credits

ESE 370 System Simulation, Modeling, and Identification

General and specific modeling and simulation of systems. Analog, digital and package program simulation techniques. The identification of systems and parameters from input-output data. Examples from electrical, medical, educational, eco-

conomic and urban systems.
Prerequisites: ESG 171 or equivalent.
Fall, 3 credits

ESE 390 Special Topics in Digital Systems

A vehicle for new course material of cur-

rent interest in the area of digital systems. When offered, a specific title and course description will be made available at registration time.

Prerequisite: ESE 318 or equivalent.
Spring, various and repetitive credit

Interdisciplinary Program in Engineering Chemistry

Program Chairman (*Materials Science*): P. J. Herley
Faculty: H. Herman, L. Seigle

Program Chairman (*Chemistry*): R. Kerber

The Departments of Chemistry and Materials Science are jointly offering a program for prospective scientists and engineers whose interests are the solid state sciences and materials technology. The program provides a basic preparation for entry into a wide range of industries or for further graduate studies in either solid state chemistry or materials science. Students pursue a chemistry core program strengthened by materials science and materials laboratory courses, the latter with a unique "chemistry of materials" orientation. The choice of suitable electives will enable the student to relate to different aspects of solid state sciences such as polymeric materials, semiconductor processing, modern industrial technology, environmental problems in industry, mineral resources, biomedical materials, etc.

For further details see catalogue listing under *Engineering Chemistry*. Students interested in this program should consult members of the program committee for details.

Engineering Science Program

The engineering science program, in which all departments of the College participate, furnishes the student with a broad background in the basic engineering disciplines. It is designed for those who wish an engineering education of a less specialized nature, or whose career goals lie outside the boundaries of the conventional engineering departments. Through the proper choice of electives and design projects a degree of specialization may be achieved within the engineering science program. Recommended course sequences in materials science and mechanics, for this purpose, are indicated below. In addition, with the help of a faculty advisor, the student may design a program uniquely suited to his own interests and objectives which cuts across

departmental and college lines. Engineering students who wish to earn a B.E. degree with concentration in applied analysis and statistics, computer science or materials science should elect the engineering science program. It is also well suited as preparation for graduate studies in architecture, business, law or medicine. Information for these studies can be provided by the faculty advisors listed on page 299.

Minimum Requirements for the Bachelor of Engineering Degree in Engineering Science

	<i>Credits</i>
<i>Humanities and Social Sciences</i>	21 minimum

1. All students must demonstrate competence in the expression of ideas in written English. This requirement may be met by satisfactorily completing EGL 101 or the English proficiency exam.

2. At least 6 credits from the course offerings in Social and Behavioral Sciences.

3. At least 6 credits from the course offerings in Arts and Humanities.

4. At least 6 more credits from the course offerings in Social and Behavioral Sciences and/or Arts and Humanities.

5. At least 3 credits of 2, 3 or 4 above must be from an approved list of upper level courses.

<i>Mathematics</i>	18 minimum
MSM 121, 122, 153, 154; MSI 155 (or approved upper division course in mathematics)	

<i>Sciences</i>	21 minimum
Physics PHY 101, 102, 151; Chemistry 101/103; 105/109; 102/104	

<i>Introductory Courses in Computer Science</i>	3 minimum
MSC 101	

<i>Engineering Science Core Program</i>	32 minimum
ESG 111, 212 (4) required. In addition, a student is required to take seven courses of the following eight with at least two courses in mechanics, materials science and electrical sciences.	

Mechanics

ESG 161, 201, 263/64

Materials

ESG 202, 232, 233

Electrical

ESG 171, 272

<i>Engineering Synthesis and Design</i>	8 minimum
Satisfied through the project phase of ESG 213, 214, 215, 216, or	

217 (2 credits) and ESG 340 and 341 (6 credits)

Engineering Specialization and Technical Electives 28-8 Core
Two engineering science core courses (8 credits) may be used towards satisfying the technical elective requirements. In addition, the student should select courses of specialization suggested by each department to acquire depth of knowledge complementary to the breadth of subject material in the core program.

Open Electives and Other Requirements as many credits
Any undergraduate University course as may be required
offered for academic credit may be for a total of
chosen for open elective credits. 128.
No more than 3 credits of Physical
Education can be used to satisfy
open elective requirements.

Recommended Course Sequences

Electrical Sciences

Students who wish to enroll in the Engineering Science Program and who are interested in electrical engineering should choose elective courses in consultation with a faculty advisor in the Electrical Sciences Department. This will assure appropriate consideration to the student's interests and goals.

Materials Science

A student may acquire professional preparation in the field of materials science by selecting the engineering science courses ESG 202, 232, and 233. In addition he or she should take the elective courses ESM 302, 306 and two additional materials science courses from the list given below.

- ESM 302 Materials Design and Techniques
- ESM 306 Mechanical Properties of Engineering Materials
- ESM 307 Physical Metallurgy
- ESM 310 Kinetic Processes in Solids
- ESM 325 Diffraction Techniques and the Structure of solids
- ESM 336 Electronic Materials

Further specialization in various branches of materials science such as physical metallurgy, ceramics, environmental corrosion and protection of materials, strength of materials, electronic and magnetic materials, biomedical materials, etc. may be obtained by taking additional elective courses. Details concerning elective course sequences in materials science are available in a brochure which can be obtained from the office of the department.

Mechanical Engineering

Specialization may be obtained within the general area of mechanics in the field of energy and environmental engineering, fluid mechanics and geophysics, and structural engineering. Students are advised to select a course sequence in consultation with a departmental advisor in the field. Typical elective sequences are as follows:

Energy and Environmental Engineering:

ESC 305, ESC 322, ESC 323, ESC 345, ESC 372, ESC 379, ESC 397, ESC 398, BIO 155, ESE 351

Fluid Mechanics and Geophysics:

ESC 345, ESC 361, ESC 372, ESC 379, ESS 347

Structural Engineering:

ESC 330, ESC 332, ESC 333, ESC 334, ESC 336, ESC 342, ESC 381, ESM 306

Department of Materials Science

Professors: John C. Bilello, Herbert R. Carleton †, Herbert Herman (*Chairman*), Franco Jona, Sumner Levine, Charles T. Prewitt ‡, Leslie L. Seigle, Franklin F. Y. Wang

Associate Professors: Patrick J. Herley, Joseph Jach, Carolyn M. Preece

The Department of Materials Science offers a wide range of interdisciplinary programs in conjunction with other science and engineering departments on campus. These programs are designed to provide a basic training for prospective graduates who can enter a wide range of industries or proceed to further graduate studies in materials science. These joint programs are aimed at the materials aspect of mechanical engineering, ocean engineering, electrical engineering and chemistry. For example, see the Engineering chemistry program or, for a program within the framework of the Mechanical Engineering Program, a materials option is available using the following four courses as technical electives: ESM 202, ESM 302, ESM 306 and ESM 307. Individualized programs are also available in Biomedical Materials, Electronic Materials and in the Environmental Properties of Materials.

†Joint appointment with Electrical Sciences

‡Joint appointment with Earth and Space Sciences

BE/MS Program:

An engineering student may apply for admission to enter this special B.E.M.S. program which will lead to a Master of Science and a Bachelor of Engineering degree at the end of his fifth year. A student in the program takes, in his senior year, 3 credits of ESM 599 which replaces 4 credits of ESG 341, and 3 credits of a graduate course. In his 5th year the student will take 24 graduate credits, of which at least 15 credits are course work and 6 credits are ESM 599. The advantages of this program over the regular M.S. program are that a student may start his M.S. thesis in his senior year, and that he needs only 24 credits in his fifth year as opposed to 30 credits for a regular M.S. student.

Courses

Departmental Technical Electives

ESM 301 Research in Materials Science

A course which involves the student in an independent research project with supervision by the faculty. Permission to register requires that the student have an average grade of B in all engineering courses and the agreement of a faculty member to supervise the research. Only three credits of research electives (MSA 390, MSC 301, ESE 301, ESM 301, ESC 301) may be counted towards fulfillment of technical elective requirements.

Fall and spring, 3 credits, repetitive
Staff

ESM 302 Materials Design and Techniques

The relationship between the microscopic structure of materials and their macroscopic properties will be studied in a laboratory/ lecture course in which the student will perform investigations using research grade equipment. Techniques for the production of new materials or the modification of existing materials in order to satisfy design criteria for engineering applications will be discussed and carried out in the laboratory. Topics such as crystal growth, impurity doping (e.g., in semiconductors), heat treatment, precipitation and solute hardening will be covered. The effects of such treatments

upon the structure of a wide range of materials (metals, semiconductors, ceramics and glasses) will be studied using X-ray diffraction, optical and electron microscopy. The effects of structural change upon the mechanical, electrical, magnetic, optical and environmental-sensitive properties of materials will be measured and correlated with the controlling treatments.

Fall, 4 credits

Mr. Bilello

ESM 305 Materials for Ocean Engineering

The engineering properties of various alloys and non-metals will be examined relative to marine applications. Of central importance will be the deterioration of materials in the sea, due to corrosion, erosion, cavitation, biofouling, etc. These effects will be considered in the selection of materials for desalination plants, deep submersibles, hulls and superstructures, propulsion systems, marine hardware and fasteners.

Prerequisite: Junior standing or permission of instructor.

Spring, 3 credits

Mr. Herman

ESM 306 Mechanical Properties of Engineering Materials

A unified approach for all solid materials will be made with regard to the correlation between microstructure and their macroscopic mechanical properties. The course deals with various testing techniques for delineating mechanical properties of materials, considering elasticity, anelasticity, plasticity, dislocation theory, cohesive strength, fracture and surface wear. Attention is given to strengthening mechanisms for solids, metals, ceramics and polymers, with a view towards learning how manipulation of microstructure can be used to design materials of specified properties. Discussion of the various engineering applications of materials and of materials selection for a number of specified tasks is pursued.

Spring, 3 credits

Mr. Bilello

ESM 307 Physical Metallurgy

A study will be made of the physical and mechanical properties of a wide range of metals and alloys, with special reference to engineering practice. Industrial processing and heat treatment of ferrous alloys will be emphasized.

Prerequisite: ESG 232.

Fall, 3 credits

Mr. Seigle

ESM 309 Thermodynamics of Solids

This course is concerned with the application of thermodynamics to analysis of phase equilibria and reactions in solids. Topics include ideal and real solutions, phase equilibrium diagrams, first and higher order phase transitions, thermodynamics of diffusion, oxidation and corrosion reactions.

Prerequisites: ESG 201 or ESG 202.

Fall, 3 credits

Mr. Seigle

ESM 310 Kinetic Processes in Solids

Atomistic rate processes in solids will be studied, with emphasis on diffusion in crystals. Theory of diffusion and experimental techniques will be developed, and the role played by a broad class of

crystalline imperfections will be examined. Topics will include annealing of deformed materials, kinetics of defect interactions, thermally controlled deformation, kinetics of nucleation and growth, solidification and precipitation.

Spring, 3 credits

Mr. Herman

ESM 325 Diffraction Techniques and the Structure of Solids

The structure of solids can be studied using X-ray, neutron and electron diffraction techniques. X-ray diffraction techniques are emphasized in this introductory course. Topics covered are: coherent and incoherent scattering of radiation, structure of crystalline and amorphous solids, stereographic projection and crystal orientation determination. The concept of reciprocal vector space is introduced early in the course and is used as a means of interpreting diffraction patterns. Laboratory work in X-ray diffraction patterns is also included to illustrate the methods.

Prerequisite: ESG 232.

Fall, 3 credits

Mr. Belillo

ESM 335 Introduction to Polymers

The objective of this course is to provide an introductory survey of the physics, chemistry, and technology of polymers. The topics covered include classification of polymers, molecular forces and bonds, structure of polymers, measurement of molecular weight and size, rheology and mechanical properties, thermodynamics of crystallization, polymerization mechanisms, commercial polymer production and processing.

Prerequisite: ESG 232.

Fall, 3 credits

Mr. Jach

ESM 336 Electronic Materials

The properties of intrinsic and extrinsic semiconductors are discussed with particular attention first to the equilibrium distribution of electrons in the bands and then to the non-equilibrium transport of charge carriers. The properties and ap-

plications of photoconductors and of luminescent materials are then described. The concept of stimulated emission is introduced, laser operation explained and laser materials discussed in relation to their applications in science and technology. Other topics considered are the properties of magnetic materials, of dielectric materials and of superconductors.

Prerequisite: ESG 233.

Fall, 3 credits

Mr. Jona

ESM 337 Dielectric and Magnetic Materials

A survey of the properties of dielectric and magnetic materials pertinent to their application in modern technology will be made. Emphasis is given to the practical material parameters which determine their uses.

Spring, 3 credits

Mr. Wang

ESM 340 Advanced Techniques of Materials Research I (Electron Microscopy)

The course will be a combined lecture/laboratory course on the theory and operation of electron microscopes for the determination of microstructure in engineering materials. The lectures will deal with the theory of the electron microscope and image formation, including kinematical and dynamical theory of diffraction contrast. The laboratory section will cover varied aspects of specimen preparation and microscope operation.

Prerequisite: Permission of instructor.

Spring, 4 credits

Mr. Siegel

ESM 351 Materials in Medical and Dental Sciences

The purpose of this course is to provide a thorough survey of the uses of materials in the medical and dental sciences. Current research and the problems en-

countered in each area will be reviewed. Topics include general considerations of materials requirements, corrosion and wear under physiological conditions, mechanical stress, interaction of materials with blood and the problems of clotting, transport of biological substances through membranes, application to the development of artificial arteries, hearts, heart valves, oxygenators, artificial kidneys and other organs, bone and dental implants.

Prerequisite: Permission of Instructor.

Spring, 3 credits

Mr. S. Levine

ESM 352 Materials in Energy Conversion

The efficiency of energy conversion devices is limited by the availability and properties of essential materials. The use of materials in energy conversion systems is examined, with emphasis on advanced devices such as magnetohydrodynamic, thermoelectric, thermionic, solar energy converters and fuel cells. The way in which materials properties influence device capability is analyzed and factors controlling energy output and conversion efficiency are explained. Materials problems in energy storage systems are examined.

Prerequisite: ESG 232 or ESG 233.

Spring, 3 credits

Mr. L. Seigle

ESM 355 Processing of Materials

The mechanical and thermal processing of a wide range of metallic and non-metallic materials will be reviewed. Both traditional and more modern forming operations will be examined. Recently developed schemes of thermomechanical treatment and thermal processing for the control of microstructure and properties will be explored.

Prerequisite: ESG 232.

Spring, 3 credits

Mr. Herman

Department of Mechanical Engineering

Professors: Abraham L. Berlad, Walter S. Bradfield (*Chairman*), Robert D. Cess, Fu-Pen Chiang, Thomas F. Irvine, Jr., Richard Shao-Lin Lee, Edward E. O'Brien, George Stell, James Tasi, Ching H. Yang

Associate Professors: Rene Chevray, Stewart M. Harris, Prasad Varanasi, Lin-Shu Wang

Mechanical Engineering Program

In addition to participating in the program leading to the Bachelor of Engineering degree in Engineering Science which was described earlier, the Department of Mechanical Engineering also offers the Bachelor of Engineering in Mechanical Engineering. This program is designed to meet the special needs of the student who wishes to pursue in depth studies in the area of mechanical engineering as preparation for either a professional career or graduate study.

Mechanical engineering is a broad field concerned with all aspects of the planning, design, development, manufacture, and evaluation of energy conversion, power generation, environmental control systems, land and marine transport vehicles and production machines. These concerns, in recent times, are made evident in mechanical engineers' special interest in areas typified by high-speed transportation, control of pollution from power producing devices, noise abatement and new sources of power such as fuel cells, solar energy and nuclear reactors.

In addition to the Engineering Concentration Requirements students in the Mechanical Engineering program must also take the Mechanical Engineering Concentration* which consists of courses in drafting, Machine Manufacturing Kinematics and Design Processes, Applied Thermodynamics, Heat and Mass Transfer, and Mechanical Engineering Laboratory. Although Mechanical Engineering is broad in scope it is still possible for the student to obtain a measure of specialization through his choice of elective courses, which can be in the areas of power/energy or mechanical engineering design. The requirements for the mechanical engineering degree and a typical course sequence are given below.

Mechanical Engineering Degree Requirements

Total credits — 128 minimum

Credits

Humanities and Social Sciences

21

1. All students must demonstrate competence in the expression of ideas in written English. This requirement may be met by satisfactorily completing EGL 101 or the English proficiency exam.

2. At least 6 credits from the course offerings in Social and Behavioral Sciences.

*Detailed course descriptions are to be found in "BEME Degree and Guide to Undergraduate Electives" which is available from the Department of Mechanics.

3. At least 6 credits from the course offerings in Arts and Humanities.
4. At least 6 more credits from the course offerings in Social and Behavioral Sciences and/or Arts and Humanities.
5. At least 3 credits of 2, 3 or 4 above must be from an approved list of upper level courses.

Mathematics 19
 Students must take MSM 121, 122, 153, 154, and MSI 155

Sciences 17
 Students must take PHY 101, 102, 151 and CHE 101/103

Computer Science 3
 Students must take MSC 101

Engineering Science 24
 Students must take ESG 111 and 212. 4
 In addition, the following courses are required:

Mechanics

ESG 201	Thermodynamics	4
ESG 161	Particle and Rigid Body Mechanics	4
ESG 263, 264	Mechanics of Solids, Fluid Mechanics	4

Materials Science

ESG 232	Structure and Properties of Materials	4
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Electrical Sciences

ESG 171	Electrical Sciences I	4
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Engineering Synthesis and Design 8
 This requirement is satisfied through the project phase
 of ESG 213, 214, 215, 216 or 217 2
 and ESG 340 and 341 6

Mechanical Engineering Core Courses 18
 The following courses must be taken to satisfy the mechanical engineering core requirements.

ESC 202	Technical Drawing	
ESC 305	Heat and Mass Transfer	
ESC 310	Machine Kinematics and Design	
ESM 355	Processing of Materials	
ESC 372	Mechanical Engineering Laboratory	
ESC 398	Thermodynamics of Power Generation	

Technical Electives

12

Central to the engineering curriculum is concentrated study to achieve a depth of understanding of one or more of the engineering disciplines. Specialized programs in Mechanical Engineering will be suggested by the Mechanics Department. No more than 3 credits of ESC 301 may be used.

Open-Electives and Other Requirements

variable

Any undergraduate University course offered for academic credit may be chosen for open elective credits. No more than 3 credits of Physical Education can be used to satisfy open elective requirements. Graduate level courses may be taken to satisfy either open elective or technical elective requirements with approval. No more than 6 credits of ESC 301 may be used.

Total 128 credits

Example Course Sequence Satisfying Minimum Requirements for a B.E. in Mechanical Engineering

<i>Freshman</i>	<i>Fall Credits</i>		<i>Spring Credits</i>
MSM 121 Calculus I	4	MSM 122 Calculus II	4
PHY 101 Gen. Phys. I	4	PHY 102 Gen. Phys. II	4
EGL 101 Composition	3	MSC 101 Comp. Sci	3
HUM/SOC elective	3	ESC 202 Technical Drawing	3
HUM/SOC elective	3	HUM/SOC elective	3
	<hr/>		<hr/>
	<i>Total</i> 17		<i>Total</i> 17

Sophomore

MSM 153 Diff. Equations	3	MSM 154 Math for Eng. I	4
PHY 151 Gen. Phys. III	4	ESG 111 Eng. Lab I	2
CHE 101/3 Chemistry	4	ESG 171 Elec. Sci. I	4
CHE 105/9 Chemistry Lab	1	ESG 201 Thermo	4
ESG 161 Particles and Rigid Body Mech.	4	HUM/SOC elective	3
	<hr/>		<hr/>
	<i>Total</i> 16		<i>Total</i> 17

Junior

MSI 155 Math for Eng. II	4	ESG 217 Eng. Expt.	2
ESG 212 Eng. Lab	2	ESC 305 Heat and Mass Trans.	3
ESG 232 Mat. Sci. I	4	ESC 310 Machine Kinetics & Design	3
ESG 263 Mech. of Solids	2	ESC 398 Thermo. of Power Generation	3
ESG 264 Intro to Fluid Mech.	2		

		ESM 355 Processing of Materials	3
	—		—
	<i>Total</i>		<i>Total</i> 14
<i>Senior</i>			
ESG 340 Eng. Des. I	2	ESG 341 Eng. Des. II	4
ESC 372 Mech. Eng. Lab	3	HUM/SOC elective	3
HUM/SOC elective	3	Elective	3
Elective	3	Elective	3
Elective	3	Elective	3
	—		—
	<i>Total</i>		<i>Total</i> 16

BE/MS Program

An engineering student may apply for admission to enter this special B.E.M.S. program which will lead to a Master of Science and a Bachelor of Engineering degree at the end of his fifth year. A student in the program takes, in his senior year, 3 credits of ESC 599 which replaces 4 credits of ESG 341, and 3 credits of a graduate course. In his 5th year the student will take 24 graduate credits, of which at least 15 credits are course work and 6 credits are ESC 599. The advantages of this program over the regular M.S. program are that a student may start his M.S. thesis in his senior year, and that he needs only 24 credits in his fifth year as opposed to 30 credits for a regular M.S. student.

Courses

Departmental Open Electives

ESC 102 Weather and Climate

An introduction to the nature and causes of common meteorological phenomena, severe weather occurrences and climatic patterns. A description of the general features of our atmosphere will be followed by specific treatment of such topics as formation and movement of air masses and large-scale storms, techniques for weather prediction, weather satellites, hurricanes, tornadoes and

thunderstorms, cloud and precipitation types, and optical and acoustical phenomena. The climatic history of the earth will be discussed as well as actual and potential effects of air pollution on weather and climate.

Fall, 3 credits

J. S. Hogan

Departmental Technical Electives

ESC 202 Fundamentals of Technical Drawing

This course undertakes a thorough study of basic rendering techniques and skills required for technical drawing including orthographic axonometric projections, rotations and perspective. Drafting techniques such as line quality, lettering and accuracy will be emphasized. The final four weeks will consist of an individual project which reflects the student's interests and reinforces the material taught in the course.

Fall, 3 credits

ESC 301 Research in Mechanics

A course which involves the student in an independent research project with supervision by the faculty. Permission to register requires that the student have an average grade of B in all engineering courses and the agreement of a faculty member to supervise the research. Only three credits of research electives (MSA 390, MSC 301, ESE 301, ESM 301, ESC 301) may be counted towards fulfillment of technical elective requirements.

Fall and spring, 3 credits, repetitive
Staff

ESC 302 Internship in Engineering Science—Mechanics

This program is designed to provide an educational opportunity for several outstanding students seeking in-the-field enrichment in a special branch of mechanics. Selected students may choose to participate in an approved cooperative work-study program involving SUNY and one or more outstanding laboratories. Lectures by SUNY faculty are augmented by a work-study program conducted in residence at the prescribed outside laboratory.

Prerequisite: Permission of instructor.
Summer, 3 credits (Pass/No Credit)
Staff

ESC 305 Heat and Mass Transfer

The fundamental laws of momentum, heat

and mass transfer are discussed and the corresponding transport coefficients are examined. Principles of steady-state and transient heat conduction in solids are investigated. Analysis of laminar and turbulent boundary layer flows are treated, as well as condensation and boiling phenomena. Thermal radiation is discussed. Radiation heat transfer between surfaces is treated. Applications to heat transfer equipment are covered throughout the course.

Prerequisite: ESG 201 and ESG 264.

Fall, 3 credits

Mr. T. F. Irvine

ESC 310 Machine Kinetics and Design

Analysis of displacements, velocities, accelerations, associated forces in plane motion mechanisms by mathematical and computer methods. A study of the fundamental principles of design as applied to mechanical components such as bearings, gears, shafting, springs, screws, belts and clutches under both static and dynamic loading. Principles of lubrication.

Prerequisite: ESG 161.

Spring, 3 credits

ESC 322 Nonequilibrium Processes in Environmental Systems

Introduction to the kinetic rate processes, flow and stability of nonequilibrium systems. Combustion, condensation, vaporization and related environmentally important thermokinetic processes. Thermokinetic stability and the stability of coupled ecological systems. Combustion and air-pollution. Applications to nonequilibrium atmospheric processes.

Prerequisite: ESG 201.

3 credits

Mr. A. Berlad

ESC 323 Combustion

Lectures and laboratory work designed as an introduction to the fundamentals of combustion processes. Combustion theory. Experimental properties of the ignition, quenching, propagation and stability of flames. Explosions and detonations. Combustion processes and air pollution. Radiative properties of flames. Dust ex-

plosions. Applications to modern systems.

Prerequisite: ESG 201.

Fall, 3 credits

Mr. A. Berlad

ESC 325 Thermal Systems in Nuclear Power Engineering

Nuclear fuel as the alternative energy source to fossil fuel for central-station power generation. Kinetics and reactor control. Reactor heat generation and removal. Reactor coolants and special reactor types. Reactor safety. Energy conversion methods and power plants.

Prerequisites: ESC 305, ESM 328.

Spring, 3 credits

Mr. L-S. Wang

ESC 329 Chemical Reactor Design

Application of combustion, thermodynamic, chemical kinetic and fluid mechanical principles to chemical reactor design. Reactor stability. Performance criteria and design optimization. Batch reactors. The continuous Stirred Tank Reactor. Plug Flow and Laminar Flow Tubular Reactors. Heterogeneous Reactors. Solid-Fluid, Gas-Liquid, and Liquid-Liquid Reactors.

Prerequisites: ESC 323 or permission of the instructor.

Spring, 3 credits

Mr. A. Berlad

ESC 330 Structural Analysis

Structural stability. Statically determinate and indeterminate structures. Analysis of trusses and frames in two dimensions. Displacement of structures using the method of virtual work. Method of superposition for analyzing statically indeterminate structures. Slope-deflection equations and moment distribution.

Prerequisite: ESG 263.

Spring, 3 credits

Mr. J. Tasi

ESC 332 Model Analysis of Architectural and Civil Structures

The course concerns the use of models to study the behavior of structures under

various loadings. The principle of similitude which governs the relationship between a model and its prototype will be discussed in detail. The principle of Muller-Breslau and the methods based on the principle for obtaining influence lines will be demonstrated. Students will be formed into small groups and each group will carry out a complete project involving the design, manufacture, testing and analysis of the model.

Prerequisite: ESG 263.

Spring, 3 credits

Mr. F. P. Chiang

ESC 333 Reinforced Concrete Design

Introduction to concrete design code. Foundation planning and general information. Design of reinforced concrete slabs, girders and columns. Pile foundation and spread footing. Prestressed concrete beam design.

Corequisite: ESC 330.

Fall, 3 credits

Mr. C. H. Yang

ESC 334 Structural Steel Design

Introduction to structural steel design codes. Analysis of loading. Design of steel tension and compression members, beams, built-up sections, composite sections, and riveted, bolted, and welded connections. Design of steel buildings. Plastic design and analysis.

Corequisite: ESC 330.

Spring, 3 credits

Mr. C. H. Yang

ESC 336 Soil Mechanics

Identification of soils. Seepage problems. Influence of porewater pressure on stress and compressibility. Theory of consolidation and settlement. Strength theory and conditions of failure.

Prerequisites: ESG 263, ESG 264.

Spring, alternate years 3 credits

Mr. J. Tasi

ESC 342 Introduction to Experimental Stress Analysis

The concepts of three dimensional stress

and strain, their transformation laws and their mutual relationships will be discussed in detail. Results from theory of elasticity as pertinent to experimental stress analysis will also be presented. Experimental techniques studied include two-dimensional photo-elasticity, resistance strain gauge, moiré method, brittle coating and analog methods. The application of different techniques to the measurement of stress and strain in models as well as actual structures will be demonstrated. Students will be formed in small groups and each group will be assigned different laboratory projects to gain experience in various experimental stress analysis methods.

Prerequisite: ESG 263.

Fall, 3 credits

Mr. F. Chiang

ESC 345 Theoretical Meteorology

This course is an introduction into the quantitative interpretation of the thermal and dynamical structure of planetary atmospheres. Topics to be covered include: hydrostatic equilibrium, hydrostatic stability and convection, solar and terrestrial radiation, the atmospheric equations of motion for a rotating planet, atmospheric energy relationships and general circulation.

Prerequisite: Permission of instructor.

Spring, 3 credits

Mr. R. Cess

ESC 346 Introduction to Climatology

The four elements of climate: solar heating, atmospheric air, rotation of the Earth, and water vapor in the air. Descriptive climatology of Koppen and Thornthwaite are discussed. A better understanding of the climate is then sought by studying the fundamental flow characteristic of a rotating, thin envelope of gas with precipitable water and subjected to differential solar heating. Possible causes of climatic changes in the past, the present, and the future are discussed. Use of climatological data and seasonal weather forecasting.

Prerequisite: ESG 264

Spring, 3 credits

Mr. L-S. Wang

ESC 348 Elements of Atmospheric Science

An introduction to the physical and chemical processes which determine the structure and composition of our atmosphere. A discussion of the chemical composition of the neutral atmosphere and ionosphere will be followed by the development of the basic equations governing atmospheric structure. The major processes at work in each region of the atmosphere will be delineated. The origin and history of our atmosphere will be discussed and man's impact on its future will be considered. Comparisons will be drawn between our own environment and the atmospheres of other planets.

Prerequisites: General Physics, Elementary Calculus, ESS 103.

Fall, 3 credits

ESC 349 Weather Prediction

Course will include a review of the development of synoptic meteorology and numerical weather prediction. Growth of air masses, fronts and cyclones will be examined. Instruction will be given in the analysis of meteorological data and the construction of surface and upper air charts. Techniques for forecasting the weather phenomena (thunderstorms, tornadoes and hurricanes) will be discussed, along with methods for predicting temperature, cloudiness and precipitation. Students will actively participate in preparing weather maps and making forecasts, making use of the new Stony Brook Weather Observatory.

Fall, 3 credits

Robert M. Atlas

ESC 361 Vehicular Dynamics

The course covers air, sea and interface vehicles. It emphasizes the application of fluid dynamic principles in evaluating the performance potential of student originated (or instructor assigned) vehicle designs. This leads to consideration of static and dynamic lifters; fluid mechanical thrusters (including foils, propellers, windmill propulsion systems and jets); fluid dynamic drag; the prediction of vehicle rectilinear performance; the fluid mechanics of maneuver-

ing; and static and dynamic stability. The study of these topics is carried out by the students through application to the individual design analysis of vehicles of their choice.

Prerequisite: ESG 264.

Spring, 3 credits

Mr. W. S. Bradfield

ESC 372 Mechanical Engineering Laboratory

This course emphasizes basic Mechanical Engineering measurements such as temperature, flow rate and pressure. In addition, certain basic thermal measurements are made, such as thermal conductivity, emissivity, heat transfer coefficients and heat exchanger performance.

Fall, 3 credits

Mr. R. Chevray

ESC 379 Compressible Gas Dynamics

One-dimensional gas dynamics and wave propagation, shock waves in supersonic flow, Prandtl-Meyer expansion and hodograph plane. The calculation of supersonic flows by small-perturbation theory and the method of characteristics. Effects of viscosity and conductivity, and concepts from gas kinetics.

Prerequisite: ESG 201, ESG 264 and MSM 154.

Spring, 3 credits

Mr. P. Varanasi

ESC 381 Structural Dynamics

The dynamic response of engineering structures is studied for steady state and transient load conditions. The topics studied are: single degree of freedom system; multi-degree of freedom system with normal coordinates; dynamic response of elastic strings, rods and beams to mechanical loading; effect of viscoelastic behavior.

Prerequisite: ESG 263.

Alternate years, 3 credits

Mr. J. Tasi

ESC 391 Statistical Theory of Fluids

A study of the bulk properties of fluids,

especially the equilibrium properties of dense fluids determined through the use of molecular distribution function and various perturbative procedures. During the latter half of the course one or more particular system and/or problem (e.g., ionic or polar fluids, critical phenomena) are examined in some detail to illustrate the use of the general methods developed.

Prerequisites: ESG 201 and permission of instructor.

Spring, 3 credits

Mr. G. Stell

ESC 393 Engineering Fluid Mechanics

This course has two objectives. One is to study the application of the principles of fluid mechanics to important areas of engineering practice such as turbomachinery, hydraulics and wave propagation. It is also intended as a preparation for advanced course work in fluid dynamics and as such extends the study of viscous effects, compressibility and inertia begun in ESG 263.

Prerequisite: ESG 264.

Spring, 3 credits

Mr. E. O'Brien

ESC 397 Air Pollution and Its Control

Air pollution is studied from the standpoint of causes, effects and controls. This includes a study of air resources, climatology and meteorological considerations in air pollution studies. The causes of our pollution are stressed, with consideration being given to variations in characteristics in different parts of the country. Physical, chemical and physiological effects of air pollution on man, plants, animals and structures are considered. Social costs are also reviewed to determine an economic basis for control in addition to esthetic and health bases. The scientific principles of controlling gaseous and particulate air pollution are discussed and related to engineering practices in the control of air pollution.

Prerequisite: Senior standing or permission of instructor.

Fall, 3 credits

Mr. S. Harris

ESC 398 Thermodynamics of Power Generation

Review of the fundamentals of thermodynamics. Applications of thermodynamics to the analysis of power-producing systems, including internal combustion engines and gas turbines. Considerations such as the increase of efficiency, improved design, optimum operating

conditions and alternate methods of power generation are given on the basis of the second law of thermodynamics. Changes in energy technology required in the light of energy and related environmental problems are discussed.

Prerequisite: ESG 201.

Fall, 3 credits

Mr. L-S Wang

Program on Technology and Society

Faculty: Ludwig Braun, Patrick J. Herley, Thomas T. Liao, E. Joseph Piel, John G. Truxal; Director Marian Visich, Jr.

Individuals are increasingly dependent on modern technology which now impinges on almost every facet of life. Furthermore, governmental decisions require public understanding of the capabilities, characteristics, and limitations of modern technology. Finally, industrial and government employees in all careers increasingly find a minimum knowledge of technology to be of critical importance in their work.

The Program on Technology and Society is the activity within the College of Engineering and Applied Sciences which encompasses the courses offered by the College for students majoring in disciplines within the Arts and Sciences. Credit for at least six courses in modern engineering and the technology-society interface will represent completion of a minor in Technology and Society.

Students may apply for admission to the minor program at any time after completion of the freshman year, although individual courses may be taken during the first year. Requirements for admission are completion of the required course ESI-190—Man, Technology, and Society and one year of college mathematics or the equivalent.

Courses

ESI-190 Man, Technology, and Society

In a consideration of the interaction of technology with both the individual and the social institution, case studies of current socio-technological problems are used to introduce the major concepts of modern information science. The concepts include modeling, decision-making, feedback, stability, and dynamics. Particular areas include energy, solid waste, transportation, health deliv-

ery, and communication, in each case study with emphasis on the man-technology interaction. The course includes the science background of social and political decisions, and then consideration of the values of the available alternatives. Primarily intended for non-engineering majors.

Fall and spring, 3 credits

J. G. Truxal, M. Visich

ESI-191 Introduction to Technology Assessment (Issues, Methods, and Cases)

Technology assessment and the consideration of alternative futures are studied in relation to the social control of technological development. Technology-initiated assessment methods will be discussed via cases such as the elimination of the SST (Super Sonic Transport) program and a technology assessment of weather modification. Assessments initiated by a socio-technological problem will also be studied by considering examples such as options for United States energy policy and mass transportation options. A series of innovative small-group activities will be used. Besides the usual seminar format for discussing issues, student activities will include a classroom presentation of the public television program called "The Advocates," playing a "Future Game," working with analog and digital computer simulations and doing a term project as part of an interdisciplinary team. Primarily intended for non-engineering majors.

Fall and spring, 3 credits

T. Liao

ESI-205 Materials in the Modern World

Presenting a study of modern materials, this course focusses on the synthesis and structure of newly developed materials and their use in today's technology. The fundamental nature of metals, ceramics, glasses, polymers, and composite materials will be explored, and their multiple uses in domestic and industrial construction will be discussed together with environmental impact. This course will provide a basic understanding of the atomic architecture of these materials, and it will show how this knowledge can be used to tailor make materials that fulfill certain novel criteria for modern technology relating specifically to their mechanical, electrical, magnetic, and thermal properties.

Spring, 3 credits

P. Herley

ESI-210 The Exploration of Space

The course presents the basic engineer-

ing and scientific concepts of the exploration of space. The main topics covered include the role of man in space, planetary investigations by unmanned satellites, and benefits derived from space exploration. The course is primarily intended for non-engineering students.

Prerequisite: ESI-190, one year of college mathematics.

Fall, 3 credits

M. Visich

ESI-220 Cybernetics

The course covers the basic concepts of cybernetics: control and communication in machines and men. The four principal topics are signals in electronic systems, sensors for signal detection and modification, communication with machines and people, and automatic feedback control including automation and natural systems. The course is designed primarily for non-engineering students.

Prerequisite: ESI-190, one year of college mathematics.

Spring, 3 credits

J. G. Truxal

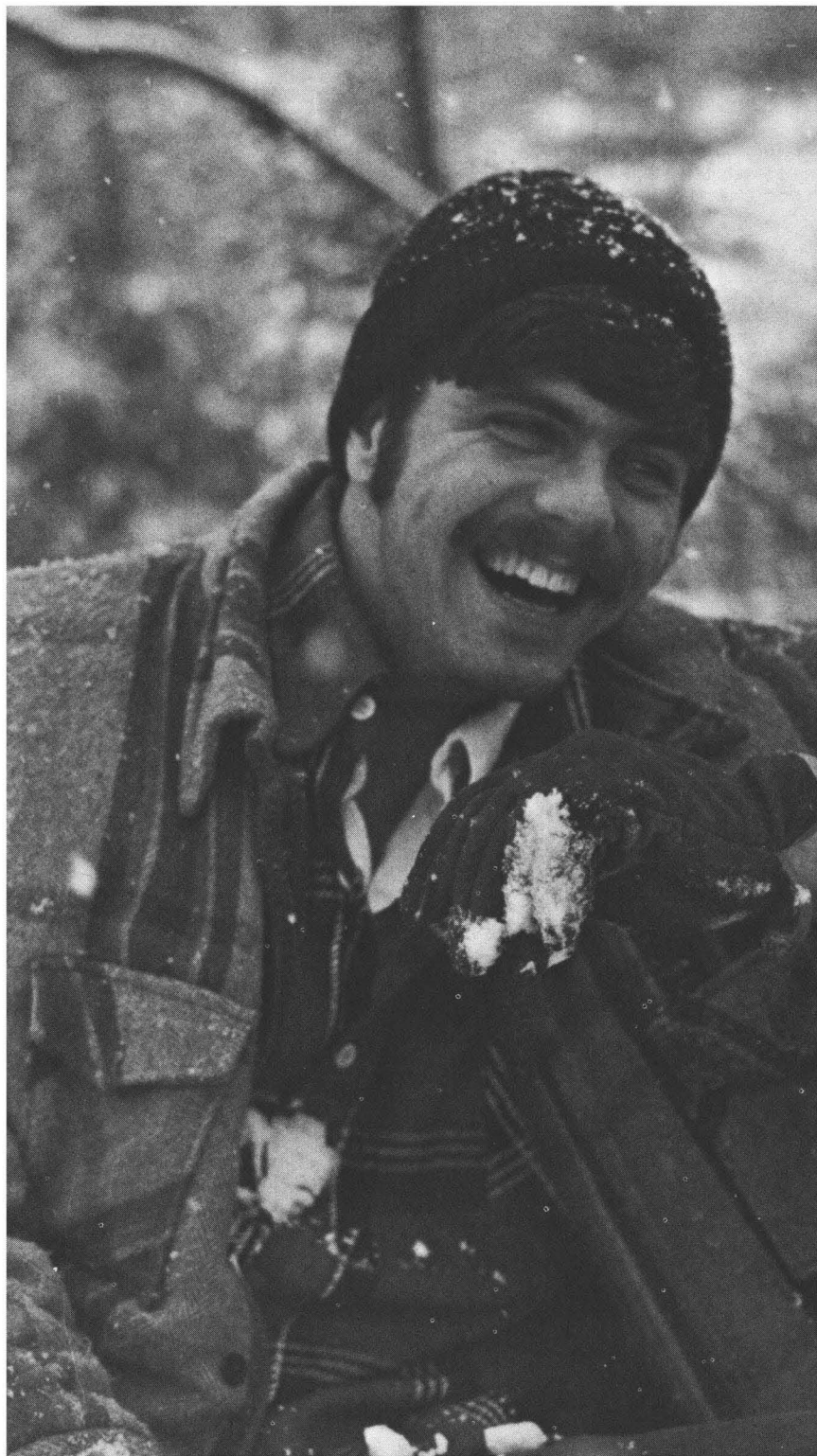
Students can also select courses from other offerings of the College of Engineering and Applied Sciences with the approval of the advisor.

ESI 222/ENS 222 Environmental Pollution and its Control

This course will focus primarily on the areas of air and water pollution. The sources of pollutants will be examined as will the methods which have been devised (or are under consideration) for their control. The possible effects of pollutants on health, property, and the global and local environment will also be considered. In the latter case, the particular problems of Long Island will be given special attention. Because of their unique nature, air and water pollution problems associated with the operation of nuclear power plants will be discussed separately. Other topics which will be discussed include solid waste disposal and noise.

Spring, 3 credits

S. Harris



The Health Sciences Center

The Health Sciences Center is an integral part of the Stony Brook Campus, offering a comprehensive education in the health professions. It consists of seven Schools set up to provide the special education needed for the training of the total range of health professionals: The Schools of Allied Health Professions, Basic Health Sciences, Dental Medicine, Medicine, Nursing, Podiatric Medicine and Social Welfare. These Schools receive support services in academic, scientific and administrative functions that are common to the programs and needs of more than one School from the following divisions: Biomedical Computer Services, Media Services, Laboratory Animal Resources, Social Sciences and Humanities, the Health Sciences Center Library and the Office of Student Services.

Clinical Campuses

The Health Sciences Center has also established a partnership with four Long Island hospitals, referred to as "Clinical Campuses" where students receive their essential patient care experience in the "field". These are: Brookhaven National Laboratory Medical Research Center; Long Island Jewish-Hillside Medical Center/Queens Hospital Center; Nassau County Medical Center and Northport Veterans Administration Hospital.

An agreement has also been signed between the Health Sciences Center and the Hamptons Hospital and Medical Center, currently being built in Westhampton Beach, establishing this as a future clinical campus for the Health Sciences Center. In addition, the Schools have limited affiliation agreements with over 50 other hospitals in the Long Island region.

Facilities

The permanent facilities for the Health Sciences Center, located on the east side of Nicolls Road, adjacent to the main campus, are planned

as a three building complex, including a Megastructure, a University Hospital and a Basic Sciences Tower, with a separate building planned for the School of Dental Medicine and Dental Care Center.

The Megastructure is comprised of a huge network structure, topped by a 10-story clinical tower. Five of the Schools—Allied Health Professions, Medicine, Nursing, Podiatric Medicine and Social Welfare—occupy this building which also contains the library, classrooms, Media Services, a computing center, administrative offices, and cafeteria.

The second stage in the construction of the Health Sciences Center's permanent facilities is a 550-bed University Hospital that will serve the Long Island region as a teaching hospital and general and tertiary care facility, with extensive outpatient services. When completed in the late 1970's, the Hospital will be a twin-towers structure, with adjoining corridors connecting it to the Megastructure.

The third stage of construction, now in progress, is a Basic Health Sciences Building. Permanent facilities for the Dental School will be erected adjacent to this building in the early 1980's.

School Information

All the Schools, except the School of Podiatric Medicine, are now in operation with a combined full and part time student enrollment of approximately 1400.

The education of health professionals requires academic programming and supportive services that differ from those offered on the core campus. As a result, a good deal of the information contained in the general chapters in this *Bulletin* is not pertinent to applicants and students in the Health Sciences Center. Please see the separate *Health Sciences Center Bulletin*, which contains information on Health Sciences Center admissions, facilities, student services, financial information and financial aid, academic regulations and procedures and the Health Sciences Center academic calendar. To receive a copy of the *Health Sciences Center Bulletin*, or information about a specific program, telephone the Health Sciences Center Office of Student Services (516) 444-4211 or the Office of the Dean of the specific school.

Program Offerings

Current offerings include both undergraduate and post baccalaureate programs. All undergraduate programs begin in the upper division.

In academic year 1976-77, the School of Allied Health Professions is offering baccalaureate degree programs in Cardio-Pulmonary Technology/Respiratory Therapy; Medical Technology; Physical Therapy; and Physician Associate. A pre-requisite unique to the Physician Associate program is at least one full year participation in the delivery of

health care.

Baccalaureate degree programs are also offered by the Schools of Nursing and Social Welfare.

Also in Academic Year 1976-77, the Health Sciences Center is enrolling M.D. candidates in the School of Medicine, D.D.S. candidates in the School of Dental Medicine, D.P.M. candidates in the School of Podiatric Medicine, and Masters degree candidates in the Schools of Social Welfare and Nursing (Nurse-Practitioner program).

The School of Basic Health Sciences offers postgraduate doctoral degree programs in Anatomical Sciences, Microbiology, Pathology, Pharmacological Sciences and Physiology and Biophysics.

Admissions Procedures

There are no freshman admissions to the Health Sciences Center. High school students interested in eventual enrollment in any of the Health Sciences Center baccalaureate programs must apply for admission to Stony Brook or to another college to complete their freshman and sophomore years.

Applications for all undergraduate programs can be obtained from the Office of Student Services in the Health Sciences Center. Applications for most undergraduate programs are available in the late fall of the year preceding the year of anticipated matriculation. Admissions are generally in the fall of each year only. Admission decisions are made by committees in each of the schools; application processing and records are handled in the Health Sciences Center Office of Student Services.

Eligibility

All baccalaureate programs are upper-division programs and last approximately two years. In order to be eligible for consideration, students must have completed 57 university credits or their equivalent before matriculating in the program to which they seek admission. Some programs require specific course prerequisites.

Admission to all undergraduate programs is by formal application only. Standards set by professional accrediting bodies limit enrollments in each of the programs, and, therefore, admission is on a selective basis. Applications are accepted from both Stony Brook students and from students transferring to Stony Brook from other educational institutions. Stony Brook undergraduate students are not automatically admitted to HSC programs; they should note that admission to any of the undergraduate programs is not simply a "change of major."

Courses Open to Core Campus Undergraduates

The courses listed in this section are offered by the Health Sciences Center but are open for elective credit to undergraduate students en-

rolled in courses of study in all departments of the University. To register for these courses students should have completed their freshman and sophomore years, or have earned a minimum of 57 university credits.

If students are not able to pre-register for these courses, they may register by submitting an add card during the Health Sciences Center regular registration or during the add-drop period.

In previous years, the Health Sciences Center's academic calendar differed from the north campus calendar because all the Health Sciences Center programs were scheduled on a quarter basis, each of ten weeks duration. Beginning September 1976, this will be changed; the calendar for both the north campus and the Health Sciences Center will be correlated; fall and spring academic periods for Health Sciences Center students will begin on the same dates as the north campus schedule.

Courses

Anatomical Sciences

HBA 393, 394 Special Topics from the Anatomical Sciences Literature

Tutorial readings in anatomical sciences with periodic conferences, reports, and examinations arranged with the instructor. Open to junior or senior students.

Prerequisite: Permission of the instructor.
Fall and spring, variable credit

faculty supervision, with emphasis on the principles of experimental design, data collection, evaluation of findings, and reporting of results. The student is expected to prepare a report on the project and be able to discuss his or her work. Open to junior or senior students.

HBA 398, 399 Research Project in Anatomical Sciences

An independent research project under

Prerequisites: Laboratory experience and permission of supervising instructor.

Fall and spring, variable credits, repetitive to 8 credits maximum

Biomathematics

HBB 398, 399 Research Project in Biomathematics

An independent research project under faculty supervision, dealing with a specific biomathematical problem. Computer facilities are available if needed. The student will be expected to prepare a report on the project and be able to

discuss the work. Open to juniors and seniors.

Prerequisite: Permission of instructor.

Fall and spring, variable 2-4 credits
Dr. Robinson.

Microbiology

HBM 320 General Microbiology

A course in microbiology, with emphasis on molecular structure and function of bacteria and viruses, molecular genetics, and immunology. Included are some representative examples of well known infectious disease processes such as diphtheria. This course satisfies the microbiology requirements for admission to veterinarian and optometry professional schools.

Prerequisite: Permission of instructor.

3 credits

Dr. Delihias

HBM 393, 394 Special Topics from the Microbiology Literature

Tutorial readings in microbiology with periodic conferences, reports, and ex-

aminations arranged with the instructor. Open to junior or senior students.

Prerequisite: Permission of instructor.

Fall and spring, variable credit

HBM 398, 399 Research Project in Microbiology

An independent research project under faculty supervision, with emphasis on the principles of experimental design, data collections, evaluation of findings, and reporting of results. The student is expected to prepare a report on the project and be able to discuss his work. Open to junior or senior students.

Prerequisites: Laboratory experience and permission of supervising instructor.

Fall and spring, 2-4 credits, repetitive, 9 credits maximum.

Pathology

HBP 393, 394 Special Topics from the Pathology Literature

Tutorial readings in pathology with periodic conferences, reports, and examinations arranged with the instructor. Open to junior or senior students.

Prerequisite: Permission of instructor.

Fall and spring, variable credit

HBP 398, 399 Research Project in Pathology

An independent research project under

faculty supervision, with emphasis on the principles of experimental design, data collection, evaluation of findings, and reporting of results. The student is expected to prepare a report on the project and be able to discuss his or her work. Open to junior and senior students.

Prerequisites: Laboratory experience and permission of the supervising instructor.

Fall and spring, 2-4 credits each semester, repetitive to 8 credits maximum.

Pharmacological Sciences

HBH 331 Fundamentals of Pharmacology

Basic principles that underlie actions of drugs on physiological processes with reference to their therapeutic and toxic actions. A survey primarily for nursing and allied health students.

Prerequisite: Introductory courses in biology and chemistry.

3 credits

HBH 372 Principles of Drug Action

Introduction to the actions of drugs, chemicals, toxins and hormones on biological systems. Receptor sites, inhibitors and toxicity will be discussed as well as the effects of drugs on the nervous system and membranes. Some familiarity with organic chemistry and biochemistry is assumed. Open to advanced undergraduates.

Prerequisite: Permission of instructor.

Spring, 3 credits

Dr. Albert

Physiology and Biophysics

HBY 302 Vertebrate Systems Physiology

Several vertebrate organ systems will be studied in depth as examples of biological organization and control. Emphasis will be placed upon the comparative approach to the physiology of animal organ systems.

Prerequisite: BIO 201.

Spring, 3 credits

Dr. Fara and Staff

HBY 350 Physiology

The normal functioning of human tissues and organs, and their regulation and integration by the nervous and endocrine systems. Special emphasis will be given to physiological control systems and the preservation of the constancy of the internal environment. Lectures, conferences, demonstrations, and laboratories. Students may not receive credit for both this course and BIO 182.

Prerequisites: College courses in biology and chemistry and some background in physical sciences, and permission of instructor.

Variable credit

Dr. LeFevre and Staff

HBY 393, 394 Special Topics from Physiology and Biophysics Literature

Tutorial readings in physiology and biophysics with periodic conferences, reports and examinations arranged with the instructor. Open to junior or senior students.

Prerequisite: Permission of instructor.

Fall and spring, variable credit

HBY 398, 399 Research Project in Physiology and Biophysics

An independent research project under faculty supervision, with emphasis on the principles of experimental design, data collection, evaluation of findings, and reporting of results. The student is expected to prepare a report on the project and be able to discuss his or her work. Open to junior or senior students.

Prerequisites: Laboratory experience and permission of the supervising instructor.

Fall and spring, 2-4 credits per semester, repetitive to 8 credits maximum

Division of Social Sciences and Humanities

Professors: Rose Laub Coser (*Sociology*), Daniel M. Fox (*History*), Howard R. Kelman (*Sociology*), Eugene Weinstein (*Sociology*)

Assistant Professor: Peter C. Williams (*Law, Philosophy*)

Lecturers: Marcia Kramer (*Economics*), Betty Lou Valentine (*Anthropology*)

The Division of Social Sciences and Humanities is an expression of the Health Sciences Center's commitment to integrate university disciplines with the training of health professionals. Faculty of the Division, all members of their respective university departments in the social sciences and humanities, function in several roles. In an effort to increase the awareness of health sciences students of the historical, social,

economic, political and philosophic context of their professional careers, the Division offers interdisciplinary learning experiences designed to develop critical thinking processes and substantive knowledge about the health professional's place in the world. The Division also provides opportunities for students to engage in further study of the disciplinary perspectives represented by its members through courses offered through the Division, other schools of the health Sciences Center and in their university departments exploring their analytical and methodological application to health and illness. Finally, the Division looks forward to participating in degree-granting programs for students wishing to combine their professional training with formal research and teaching preparation in the social sciences and humanities.

Note: Graduate Students wishing work in areas with 300 listings may, by taking independent study (HSH 590, 1, 2, 3), arrange a course of study.

Courses

HSH 331/2 Legal and Ethical Issues in Health Care

This course is intended to introduce students to some of the major ethical and legal doctrines that affect health care professionals. The doctrines will be discussed by addressing ourselves to specific problem situations. Some of the topics are: the right to refuse medical, mental, and social care; the right to life and its limits (e.g. suicide, euthanasia, abortion); the right to receive care: access to and evaluation of health care delivery. Since the goal of the course is to sensitize professionals to legal and ethical issues like those they shall be called upon to resolve, students will be expected to take part in class discussions and do readings.

2 credits per quarter

Dr. Williams

HSH 361 Health and Society

An examination of the reciprocal relationships between health, health care organizations and social structure. The contribution of social factors in the definition and determination of health and disordered states of health. The

impact of ill health on social institutions and groups.

2 credits

Dr. Kelman

HSH 362 Sociology of Disability and Rehabilitation

Definitions and determinates of disability and handicap in children and adults. Rehabilitation viewed as an ideology and as a system of care. Implications for health care organization and professional functioning.

2 credits

Dr. Kelman

HSH 380 Introduction to Health Economics

This course is designed to introduce students to principles of economics with special emphasis on their application to the Health Care Delivery System.

2 credits

Ms. Kramer

HIS 293 Medicine and Society Since 1789

A survey of ideas, innovators and institutions in medical thought and practice

and the delivery of health care. The course begins with consideration of the impact of the ideas of the Enlightenment and the French Revolution on medicine and concludes with assessment of the historical context of contemporary problems in health care. Most of the subject matter will be drawn from the history of the U.S., but the Atlantic will be regarded as a bridge rather than a barrier.

Dr. Fox

**HSH 365, 366 Illness and Health in
the Social Context**

Illness as a social fact. Structural sources of health and illness in family and community. Health-restoring agents; physician and nurse. The function and organization of hospitals.

2 credits

Coser

Directories

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State University of New York

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GENERAL STATEMENT

The State University of New York, now in its 28th year of service, is the largest, centrally managed, multi-level system of public higher education in the nation.

Since its founding in 1948, through consolidation of 29 State-supported but unaffiliated campuses, the University has grown in response to need until its services are now felt educationally, physically and culturally the length and breadth of New York State.

The University's 64 geographically dispersed campuses bring educational opportunity within commuting distance of virtually all New York citizens. In many communities, the SUNY campuses are cultural centers of the area and a significant contributor to the local economy.

In academic 1975-76, nearly 355,000 students are studying in its classrooms or pursuing study at home, at their own pace, through such innovative institutions as Empire State College, a campus without walls. More than 100,000 students are 24 years of age or older, reflecting SUNY's ability to adjust to meet the needs of more mature students.

During its relatively brief existence, it has graduated more than 600,000 alumni, the majority of whom are pursuing their careers in villages, towns and cities across the State.

Chancellor Ernest L. Boyer, in a recent report to the University's Trustees, emphasized the diverse role of SUNY when he said:

"The State University welcomes not only the future architects, business executives, engineers, surgeons and literary critics, but also future dairy farmers and medical technicians, accountants and social workers, foresters and automobile mechanics. And through work in films, electronics, pollution control, data processing, police science, urban studies and similar fields, the University seeks to educate persons for tomorrow's roles as well as those of today."

To provide such opportunity on a continuing basis, the University is uniquely organized into a system comprised of:

Four University centers (two of which, Buffalo and Stony Brook, include health science centers); two medical centers; 13 colleges of arts and science, a non-residential college; three specialized colleges, six agricultural and technical colleges; five statutory colleges administered in cooperation with Cornell and Alfred Universities, and 30 locally-sponsored community colleges.

In addition to baccalaureate studies, 12 of the senior campuses offer graduate study at the doctoral level, and 22 at the master's level.

The two-year colleges offer associate degree opportunities in arts and science in a wide range of technical areas. They also provide transfer programs within the University for students wishing to continue to the baccalaureate degree.

Ten Educational Opportunity Centers serve the educationally deprived by upgrading occupational skills for more gainful employment and identifying students with college potential to prepare them for enrollment in the state's public and private colleges.

Overall, at its EOCs, two-year colleges, four-year campuses and university and medical centers, the University offers 3,500 academic programs.

State University is governed by a Board of Trustees, appointed by the Governor, which determines the policies to be followed by the 34 State-supported campuses.

The 30 community colleges operating under the program of State University have their own local board of trustees. The State contributes one-third to 40 percent of their operating costs and one-half of their capital costs.

The State University motto is "Let Each Become All He Is Capable of Being."

Campuses

University Centers

State University at Albany; State University at Binghamton; State University at Buffalo; State University at Stony Brook.

Medical Centers

Downstate Medical Center at Brooklyn; Upstate Medical Center at Syracuse.

Colleges of Arts and Science

College at Brockport; College at Buffalo; College at Cortland; Empire State College; College at Fredonia; College at Geneseo; College at New Paltz; College at Old Westbury; College at Oneonta; College at Oswego; College at Plattsburgh; College at Potsdam; College at Purchase; College at Utica/Rome.

Specialized Colleges

College of Environmental Science and Forestry at Syracuse; Maritime College at Fort Schuyler (Bronx); College of Optometry at New York City.

Agricultural and Technical Colleges (Two-Year)

Alfred; Canton; Cobleskill; Delhi; Farmingdale; Morrisville.

Statutory Colleges

College of Ceramics at Alfred University; College of Agriculture and

Life Sciences at Cornell University; College of Human Ecology at Cornell University; College of Industrial and Labor Relations at Cornell University; Veterinary College at Cornell University.

Community Colleges

(Locally-sponsored, two-year colleges under the program of State University)

Adirondack Community College at Glens Falls; Auburn Community College at Auburn; Borough of Manhattan Community College; Bronx Community College; Broome Community College at Binghamton; Clinton Community College at Plattsburgh; Columbia-Greene Community College at Athens; Community College of the Finger Lakes at Canandaigua; Corning Community College at Corning; Dutchess Community College at Poughkeepsie; Erie Community College at Buffalo; Fashion Institute of Technology at New York City; Fulton-Montgomery Community College at Johnstown; Genesee Community College at Batavia; Herkimer County Community College at Herkimer; Hostos Community College at South Bronx; Hudson Valley Community College at Troy; Jamestown Community College at Jamestown; Jefferson Community College at Watertown; Kingsborough Community College; LaGuardia Community College at Long Island City; Mohawk Valley Community College at Utica; Monroe Community College at Rochester; Nassau Community College at Garden City; New York City Community College; Niagara County Community College at Sanborn; North Country Community College at Saranac Lake; Onondaga Community College at Syracuse; Orange County Community College at Middletown; Queensborough Community College; Rockland Community College at Suffern; Schenectady County Community College at Schenectady; Staten Island Community College; Suffolk County Community College at Selden; Sullivan County Community College at South Fallsburg; Tompkins-Cortland Community College at Groton; Ulster County Community College at Stone Ridge; Westchester Community College at Valhalla.

State University of New York At Stony Brook

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- WALTER S. BRADFIELD**
Professor of Engineering
B.S., Purdue University; M.S., California Institute of Technology; A.E., University of Michigan; Ph.D., University of Minnesota
- DANA BRAMEL**
Professor of Psychology
B.A., Reed College; Ph.D., Stanford University
- NIGDA NIN BRASCH**
Part-time Lecturer in Puerto Rican Studies
B.A., C. W. Post College
- LUDWIG BRAUN**
Professor of Engineering
B.E.E., M.E.E., D.E.E., Polytechnic Institute of Brooklyn
- ALVIN BREHM**
Performing Artist in Residence and Part-time Lecturer, Department of

- Music**
B.S., M.A., Columbia University;
Diploma, Juilliard Graduate School
- PETER BREITENLOHNER**
*Research Associate, Institute for
Theoretical Physics*
Dr.Phil., Universität Graz
- ROBERT BRENNAN**
Assistant Professor of Education
B.A., Salem College; M.A.T., Ed.D.,
Harvard University
- PETER BRETSKY**
Associate Professor of Paleontology
A.B., Lafayette College; M.S.,
Southern Methodist University;
Ph.D., Yale University
- SARA S. BRETSKY**
*Adjunct Assistant Professor of Earth
and Space Sciences*
B.S., Southern Methodist University;
M.S., Ph.D., Yale University
- DARRYL W. BRIDSON**
Part-time Visiting Lecturer in English
A.A., B.S., Boston University
- ADELE C. BRODY**
*Part-time Visiting Associate Professor
of Urban and Policy Sciences*
B.S., L.L.B., St. John's University
School of Law; M.L.L., New York
University School of Law
- RICARDO A. BROGLIA**
Visiting Professor of Physics
M.S., Ph.D., University of Cuyo,
Argentina
- FREDERICK BROWN**
Professor of French
B.A., Ph.D., Yale University
- GERALD E. BROWN**
*Professor of Physics and Member,
Institute for Theoretical Physics*
M.S., Ph.D., Yale University; Ph.B.,
University of Wisconsin; D.Sc.,
University of Birmingham, England
- PAULA BROWN**
Professor of Anthropology
B.A., M.A., University of Chicago;
Ph.D., University of London
- RUSSELL E. BROWN**
Associate Professor of German
B.A., Rutgers University; M.A.,
Columbia University; Ph.D.,
Harvard University
- WILLIAM J. BRUEHL**
Associate Professor of Theatre Arts
M.A., Ph.D., University of Pennsylvania
- JUSTUS BUCHLER**
Distinguished Professor of Philosophy
B.S.S., City College of New York;
M.A., Ph.D., Columbia University
- ELAINE H. BUDDÉ**
*Associate Professor and Chairperson
of Physical Education*
B.S., Illinois State University;
M.A., University of Michigan;
Ph.D., University of Wisconsin
- DAVID B. BURNER**
Associate Professor of History
B.A., Hamilton College; Ph.D.,
Columbia University
- MARTIN BUSKIN**
Part-time Lecturer in English
B.A., New York University
- JOHN CAIRNS**
*Professor of Biological Sciences
(Joint Appointment with Cold Spring
Harbor Laboratory for Quantitative
Biology, Cold Spring Harbor, N.Y.)*
M.D., Oxford University
- PENNY R. CALDWELL**
*Part-time Lecturer in Continuing and
Developing Education*
B.A., University of Missouri; M.S.,
SUNY at Albany
- JAMES F. CALHOUN**
Associate Professor of Psychology,
B.A., University of Florida; B.D.,
Southern Methodist University; M.A.,
Ph.D., University of Illinois
- MARTIN CANIN**
*Performing Artist in Residence and
Part-time Lecturer, Department of
Music*
B.S., M.S., Juilliard School of Music
- HERBERT R. CARLETON**
Professor of Engineering
B.A., University of Southern California;
Ph.D., Cornell University
- ALBERT D. CARLSON**
*Associate Professor of Biological
Sciences*
B.A., M.A., Ph.D., State University
of Iowa
- ELOF A. CARLSON**
*Distinguished Teaching Professor
of Biological Sciences*
B.A., New York University;
Ph.D., Indiana University

- CARL P. CARLUCCI
Adjunct Instructor in Urban and Policy Sciences
B.A., M.S., State University of New York at Stony Brook
- EDWARD J. CARPENTER
Associate Professor in the Marine Sciences Research Center
B.S., SUNY at Fredonia; M.S., Ph.D., North Carolina State University
- PEDRO CARRASCO
Professor of Anthropology
Maestro en Ciencias Antropologicas, Universidad Nacional, Mexico; Ph.D., Columbia University
- CARL R. CARROLL
Visiting Assistant Professor of Biological Sciences
B.A., Ph.D., University of Chicago
- T. OWEN CARROLL
Associate Professor of Urban and Policy Sciences, Director of the Rockefeller Program and Member, Institute for Urban Science Research
B.S., University of California; Berkeley; Ph.D., Cornell University
- HARRY H. CARTER
Part-time Professor in the Marine Science Research Center
B.S., U.S. Coast Guard Academy; M.S., Scripps Institution of Oceanography
- NEVILLE CARTER
Professor of Geophysics
A.B., Pomona College; M.A., Ph.D., University of California at Los Angeles
- AARON S. CARTON
Professor of Education
B.A., City College of New York; A.M., Ph.D., Harvard University
- ANDREW E. CASAZZA
Part-time Adjunct Associate Professor of Youth and Community Studies
B.A., St. Francis College; M.S.S., Fordham University
- LEOPOLDO CASTEDO
Professor of Art
B.A., University of Madrid; M.A., University of Barcelona; Professor Extra-ordinario, University of Chile
- ROBERT D. CESS
Professor of Engineering
B.S., Oregon State University; M.S., Purdue University; Ph.D., University of Pittsburgh
- SHELDON S. L. CHANG
Professor of Engineering
B.S., National Southwest Associated University, Kuming, China; M.S., National Tsinghua University, Kunming, China; Ph.D., Purdue University
- SHERRY S. R. CHANG
Assistant Librarian, Science-Engineering Library
B.A., National Taiwan University; M.L.S., State University College of New York at Geneseo
- SUSAN CHANOVER
Lecturer in the Linguistic Program
B.A., Wellesley College; M.A., New York University
- LEONARD S. CHARLAP
Professor of Mathematics
S.B., Massachusetts Institute of Technology; Ph.D., Columbia University
- JEFF CHEEGER
Professor of Mathematics
B.A., Harvard University; Ph.D., Princeton University
- CHI-TSONG CHEN
Professor of Engineering
B.S., National Taiwan University; M.S., National Chiao-Tung University, Taiwan; Ph.D., University of California, Berkeley
- YUNG MING CHEN
Professor of Applied Mathematics and Statistics
B.S., University of Maryland; M.S., Drexel Institute of Technology; M.A., University of California, Berkeley; Ph.D., New York University
- JOHN C. CHERNIAVSKY
Assistant Professor of Computer Science
B.S., Stanford University
M.S., Ph.D., Cornell University
- PEARL CHERTOK
Part-time Lecturer in Music
- RENE CHEVRAY
Associate Professor of Engineering
B.S., University of Toulouse, France; Dipl. Ing. E.N.S.E.E.H.T., France; M.S., Ph.D., University of Iowa
- FU-PEN CHIANG
Professor of Engineering
B.S., National Taiwan University; M.S., Ph.D., University of Florida

- ERNESTO CHINCHILLA-AGUILAR
Professor of History
Maestro en Historia, Escuela Nacional
de Antropología e Historia de Mexico;
Professor, San Carlos University of
Guatemala
- BENJAMIN CHU
Professor of Chemistry
B.Sc., St. Norbert University; Ph.D.,
Cornell University
- VINCENT P. CIRILLO
Professor of Biological Sciences
B.A., University of Buffalo; M.S.,
New York University; Ph.D.,
University of California at Los Angeles
- HUGH G. CLELAND
Associate Professor of History
B.A., West Virginia University; M.A.,
University of Pittsburgh; Ph.D.,
Western Reserve University
- MARSHALL J. COHEN
*Part-time Lecturer in Continuing and
Developing Education*
A.B., Rutgers University; M.A., Ph.D.,
Harvard University
- SYLVA M. COHN
Associate Professor of Mathematics
Diploma, Wilson Junior College; S.B.,
University of Chicago; M.A.L.S.,
Wesleyan University; M.A., Stanford
University
- STEPHEN COLE
Professor of Sociology
B.A., Ph.D., Columbia University
- GRACE E. COLLINS
Assistant Professor of English
B.A., Morgan State College; M.A.,
Ph.D., University of Michigan
- MITSUKO COLLVER
Associate Librarian, Cataloging
B.A., M.A., University of Michigan
- O. ANDREW COLLVER
*Associate Professor of Sociology and
Chairman of Interdisciplinary Program
in Environmental Studies*
B.A., University of Oregon; M.A.,
Ph.D., University of California,
Berkeley
- DONALD C. COOK
*Librarian and Assistant Director
for Public Services*
B.A., New York State College for
Teachers, Albany; M.A., University of
Chicago
- ARTHUR P. COOLEY
*Part-time Adjunct Associate Professor
in the Marine Sciences Research
Center*
B.S., M.S., Cornell University
- CHESTER D. COPEMANN
*Assistant Professor of Psychology
and part-time Assistant Dean of the
Graduate School*
B.S., Howard University; Ph.D.,
State University of New York at
Stony Brook
- LEWIS A. COSER
Distinguished Professor of Sociology
Ph.D., Columbia University
- ROSE LAUB COSER
*Professor of Medical Social Sciences
and Sociology*
"Certified" in Philosophy, Ecole Libre
des Hautes Etudes; M.A., Ph.D.,
Columbia University
- XENIA V. COULTER
Assistant Professor of Psychology
B.Mus., University of Michigan; M.A.,
Kent State University; Ph.D.,
Princeton University
- EDWARD COUNTEY
Associate Professor of Art
Pupil of Moses Soyer and
Chaim Gross; Atelier 17
- ERNEST D. COURANT
*Part-time Professor of Physics and
Engineering and Member, Institute
for Theoretical Physics*
B.A., Swathmore College; M.S.,
Ph.D., Rochester University
- RHONDA L. COURTNEY
Assistant Librarian
B.A., SUNY at Binghamton; M.L.S.,
SUNY at Albany
- BRENDA COVEN
Assistant Librarian, Circulation
B.A., City College of New York;
M.L.S., Columbia University
- RUTH SCHWARTZ COWAN
Associate Professor of History
B.A., Barnard College; M.A.,
University of California, Berkeley;
Ph.D., Johns Hopkins University
- MICHAEL J. COWEN
Assistant Professor of Mathematics
B.A., Northwestern University; Ph.D.,
Massachusetts Institute of Technology

- R. DAVID COX
Part-time Visiting Lecturer in English
B.A., M.A., University of Colorado
- MARY LOUISE CREED
Assistant Librarian
A.B., University of North Carolina;
M.L.S., Long Island University
- DAVID V. CROSS
Associate Professor of Psychology
B.A., M.A., Ph.D., University of
Michigan
- RICHARD M. CUMMINGS
*Part-time Adjunct Associate Professor
of Youth and Community Studies*
A.B., Princeton University; J.D.,
Columbia Law School; M.Litt.,
Cambridge University
- EDWARD J. CZERWINSKI
*Professor of Germanic and
Slavic Languages*
B.A., Grove City College, Pa.; M.A.,
Pennsylvania State University; M.A.,
Ph.D., University of Wisconsin
- ARLEEN B. DALLERY
Assistant Professor of Philosophy
B.A., Bryn Mawr College; M.A., Ph.D.,
Yale University
- ROBERT CARLETON DALLERY
*Part-time Assistant Professor of
Philosophy*
B.A., M.A., Ph.D., Yale University
- THOMAS R. DARGAN
Lecturer in Experimental College
B.A., City University of New York,
City College; M.A., State University
of New York at Stony Brook
- RAOUL A. DAVIS
*Adjunct Associate Professor in Youth
and Community Studies*
B.S., Central State University; M.A.,
Teacher's College, Columbia
University
- WALLACE M. DAVIS
Assistant Professor of Sociology
B.A., University of Notre Dame;
M.A., Princeton University
- ALICE DAVISON
Assistant Professor of Linguistics
B.A., Bryn Mawr College; M.A.,
University of Chicago
- GERALD C. DAVISON
Professor of Psychology
B.A., Harvard University;
Ph.D., Stanford University
- WILLIAM S. DAWES
Lecturer in Economics
B.A., Lawrence University;
Ph.D., Purdue University
- RAMESH DAYAL
*Adjunct Assistant Professor in the
Marine Sciences Research Center*
M.Sc., University of Stuttgart
- ROMAN V. de la CAMPA
*Lecturer in Hispanic Languages and
Literature*
B.A., Briar Cliff College; M.A.,
University of Arkansas; Ph.D.,
University of Minnesota
- EVELYN B. DELFYETT
Part-time Lecturer in Education
B.A., Montclair State College; M.A.,
Teacher's College, Columbia
University
- JACK DEMAREST
Part-time Lecturer in Psychology
B.A., SUNY at Brockport; M.A.,
Connecticut College
- KARL W. DEMUTH
*Adjunct Lecturer in History and
Assistant to the Vice President
for Liberal Studies*
B.A., Rutgers University; M.A.,
Harvard University
- MICHAEL S. DENCI
*Adjunct Assistant Professor of
Economics and Assistant Dean of the
Graduate School*
B.S., Fairleigh Dickinson University;
M.S., Columbia University
- ANTONIO de NICHOLAS
Associate Professor of Philosophy
B.A., Poona, India; M.A.,
Ph.D., Fordham University
- ROBERT M. DERMAN
*Part-time Adjunct Associate Professor
of Youth and Community Studies*
A.B., M.D., Northwestern University
- RAYMOND DES ROCHES
*Performing Artist in Residence and
Part-time Lecturer, Department of
Music*
B.M., M.M., Manhattan School of
Music
- ROBERT LEE DEZAFRA
Associate Professor of Physics
B.A., Princeton University;
Ph.D., University of Maryland

- ANNE MARIE de ZEEUW
Lecturer in Music
B.Mus., Michigan State University;
M.M., Ph.D., The University of Texas
at Austin
- DANIEL DICKER
*Professor and Graduate Program
Director of Applied Mathematics and
Statistics*
B.C.E., City College of New York;
M.C.E., New York University;
Eng.Sc.D., Columbia University
- FORREST DILL
Assistant Professor of Sociology
B.A., Northwestern University; M.A.,
Ph.D., University of California,
Berkeley
- DAVID A. DILWORTH
*Associate Professor of Philosophy
and Asian Studies*
B.A., M.A., Ph.D., Fordham University;
Ph.D., Columbia University
- ROBERT T. DODD, JR.
Professor of Mineralogy
B.S., Cornell University; M.S., Ph.D.,
Princeton University
- PAUL J. DOLAN
Associate Professor of English
B.A., St. Francis College; A.M., Ph.D.,
New York University
- VACLAV J. DOLEZAL
*Professor of Applied Mathematics
and Statistics*
Ing., Technical University in Prague;
C.Sc., Czechoslovak Academy of
Sciences
- JIMMIE DAVE DOLL
Associate Professor of Chemistry
B.S., University of Kansas;
Ph.D., Harvard University
- PETER M. DOLLARD
Associate Professor of Engineering
B.E.E., M.E.E., Ph.D., Polytechnic
Institute of Brooklyn
- RAOUF DOSS
Professor of Mathematics
Licence-es-Sciences, University of
Paris; Ph.D., Cairo University
- RONALD G. DOUGLAS
Professor of Mathematics
B.S., Illinois Institute of Technology;
Ph.D., Louisiana State University
- MAX DRESDEN
*Professor of Physics and Executive
Officer, Institute for Theoretical
Physics*
M.S., University of Amsterdam;
Ph.D., University of Michigan
- BARBARA DUDLEY
*Assistant Professor of Physical
Education*
B.S., North Texas State University;
M.F.A., University of North Carolina
- BERNARD S. DUDOCK
*Associate Professor of Biological
Sciences*
B.S., City College of New York;
Ph.D., Pennsylvania State University
- PAUL J. DUDZICK
*Assistant Professor of Physical
Education*
B.A., Syracuse University
- IVER W. DUEDALL
*Assistant Professor of Marine
Environmental Studies*
B.S., M.S., Oregon State University;
Ph.D., Dalhousie University,
Nova Scotia
- RICHARD DUSANSKY
Professor of Economics
B.A., Brooklyn College; Ph.D.,
Brown University
- RICHARD DYER-BENNET
Associate Professor of Theatre Arts
University of California, Pupil of
Cornelius Reid
- THOMAS J. D'ZURILLA
Associate Professor of Psychology
B.A., Lafayette College; M.A.,
Ph.D., University of Illinois
- NANCY L. EATON
Associate Librarian
B.A., Stanford University;
M.L.S., The University of Texas
- CURTIS C. EBBESMEYER
*Adjunct Assistant Professor in the
Marine Sciences Research Center*
B.S., California State University;
M.S., Ph.D., University of Washington
- DAVID EBIN
Associate Professor of Mathematics
B.A., Harvard University; Ph.D.,
Massachusetts Institute of Technology
- TIMOTHY EDDY
Performing Artist in Residence and

- Part-time Lecturer in Music*
B.M., M.M., Manhattan School of Music
- MICHAEL L. EDELSON
Assistant Professor of Art
- LELAND N. EDMUNDS, JR.
Associate Professor and Acting Provost for the Biological Sciences
B.S., Davidson College; M.A., Ph.D., Princeton University
- LEONARD EISENBUD
Professor of Physics
B.S., Union College; Ph.D., Princeton University
- YASSIN EL-AYOUTY
Part-time Professor of Political Science
B.S., State Teacher's College, Trenton; M.A., Rutgers University; Ph.D., New York University
- BETTY LEE ELKIN
Associate Librarian and Head of Circulation
B.A., Concord College; M.S.L.S., Columbia University
- BARBARA E. ELLING
Associate Professor of German
B.A., University of Utah; M.A., Hofstra University; Ph.D., New York University
- DAVID EMMERICH
Associate Professor of Psychology
B.A., Princeton University; Ph.D., Indiana University
- HELEN JONES-EMMERICH
Assistant Professor of Psychology
B.A., University of Georgia; Ph.D., University of Illinois
- RODERICH ENGELMANN
Associate Professor of Physics
B.A., Ph.D., University of Heidelberg
- ALAN D. ENTINE
Adjunct Associate Professor of Economics and Assistant Academic Vice President
B.A., Middlebury College; M.A., Ph.D., Columbia University
- DAVID V. ERDMAN
Professor of English
B.A., Carleton College; Ph.D., Princeton University
- FRANK C. ERK
Professor of Biological Sciences
B.A., Evansville College; Ph.D., Johns Hopkins University
- LOUISE V. FAINBERG
Assistant Professor of Hispanic Languages
B.A., Montclair State College; M.A., Ph.D., University of California, Berkeley
- LORRAINE FARAND
Lecturer in Education
B.S., State University College of New York at Oswego; M.L.S., Queens College
- HERSHEL FARKAS
Professor of Mathematics
B.A., Ph.D., Yeshiva University
- LOUIS C. FARON
Professor of Anthropology
A.B., Ph.D., Columbia University
- JAMES S. FARRIS
Associate Professor of Biological Sciences
B.S., University of Massachusetts; M.S., Ph.D., University of Michigan
- RICHARD FEINBERG
Assistant Librarian, Reference
B.B.A., The Baruch School, City College of New York; M.A., Western Michigan University; M.L.S., University of Michigan
- ARNOLD M. FEINGOLD
Professor of Physics
B.A., Brooklyn College; M.A., Ph.D., Princeton University
- RICHARD H. FEINGOLD
Part-time Lecturer in Continuing and Developing Education
B.A., Hofstra University; MA/LS, SUNY at Stony Brook
- SCOTT L. FELD
Lecturer in Sociology
B.S., SUNY at Stony Brook
- KENNETH FELDMAN
Associate Professor of Sociology
B.A., M.A., Ph.D., University of Michigan
- CHARLES M. FIDUCCIA
Assistant Professor of Computer Science
B.S.E.E., Newark College of Engineering; Sc.M., Ph.D., Brown University
- EDWARD FIESS
Associate Professor of English
B.A., Antioch College; A.M., Wesleyan University; Ph.D., Yale University

- STEPHEN J. FINCH
Assistant Professor of Applied Mathematics and Statistics
B.S., St. Louis University; M.A., Ph.D., Princeton University
- AARON FINERMAN
Professor of Engineering
B.C.E., City College of New York; S.M., in C.E., Sc.D., Massachusetts Institute of Technology
- LARRY W. FINGER
Visiting Professor of Crystallography
B.Physic., Ph.D., University of Minnesota
- GUIDO FINOCCHIARO
Professor of Physics
Ph.D., Catania University, Italy
- KARL WALTER FLESSA
Assistant Professor of Paleontology
A.B., Lafayette College; Ph.D., Brown University
- DIANE FORTUNA
Assistant Professor of English
B.A., New York University; M.A., Ph.D., Johns Hopkins University
- DAVID FOSSAN
Professor of Physics
B.A., St. Olaf College; M.S., Ph.D., University of Wisconsin
- FRANK W. FOWLER
Associate Professor of Chemistry
B.A., University of South Florida; Ph.D., University of Colorado
- JAMES A. FOWLER
Assistant Professor of Biological Sciences
B.S.E. in Elec. Eng., Princeton University; M.A., Ph.D., Columbia University
- BARRY M. FOX
Instructor in the Advancement on Individual Merit Program
B.S., Polytechnic Institute of Brooklyn; M.A., SUNY at Stony Brook
- DANIEL FOX
Adjunct Associate Professor of History, Professor of Humanities in Medicine and Assistant Vice President for Academic Affairs, Health Sciences Center
Ph.D., Harvard University
- DAVID FOX
Professor of Physics, and Director of Graduate Studies in Physics
B.A., M.A., Ph.D., University of California, Berkeley
- WILLIAM C. FOX
Associate Professor of Mathematics
B.A., Grinnell College; Ph.D., University of Michigan
- ALAN B. FRANCIS
Instructor in Spanish
B.A., SUNY at Buffalo; M.A., Harvard University
- CHARLES FRANCO
Part-time Lecturer in French and Italian
B.A., McMaster University; M.A., Rutgers University
- JAMES C. FRAUENTHAL
Visiting Associate Professor of Engineering
B.S.M.E., Tufts University; M.S., Ph.D., Harvard University
- DANIEL Z. FREEDMAN
Professor of Physics and Member, Institute for Theoretical Physics
B.A., Wesleyan University; M.S., Ph.D., University of Wisconsin
- MARTIN FREUNDLICH
Associate Professor of Biological Sciences
B.A., Brooklyn College; M.S., Long Island University; Ph.D., University of Minnesota
- EDWARD I. FRIEDLAND
Assistant Professor of Political Science
S.B., Massachusetts Institute of Technology; M.B.A., University of California, Berkeley; M.A., Ph.D., University of California at Los Angeles
- HAROLD L. FRIEDMAN
Professor and Chairman, Department of Chemistry
B.Sc., Ph.D., University of Chicago
- RONALD FRIEND
Associate Professor of Psychology
B.A., M.S., University of Western Ontario; Ph.D., University of Toronto
- JOHN A. FRIZZOLA
Part-time Adjunct Assistant Professor of Environmental Studies
B.S., Manhattan College; M.S., New York University
- DONALD K. FRY
Professor of English and Chairman of the Comparative Literature Program
B.A., Duke University; M.A., Ph.D., University of California, Berkeley

- ELINOR FUCHS
Adjunct Lecturer in the Social Science Program
B.A., Radcliffe College
- SARAH FULLER
Associate Professor of Music
B.A., Radcliffe College; M.A., Ph.D., University of California, Berkeley
- KENNETH W. FURST
Associate Librarian and Science-Engineering Librarian
A.B., Bethany College; A.M., M.S. in L.S., Columbia University
- DOUGLAS J. FUTUYMA
Assistant Professor of Biological Sciences
B.S., Cornell University; M.S., Ph.D., University of Michigan
- BARBARA GABOR
Assistant Librarian
B.A., State University College of New York at Geneseo; M.S.L.S., University of North Carolina
- JOHN GAGNON
Professor of Sociology
B.A., Ph.D., University of Chicago
- PASCAL J. GAMBARDILLA
Part-time Lecturer in the Institute for Theoretical Physics
B.S., Case Western Reserve University; M.A., SUNY at Stony Brook
- ELIZABETH GARBER
Assistant Professor of History
B.Sc., University of London; M.S., Ph.D., Case Institute of Technology
- LEONARD GARDNER
Professor of Education
B.S., Roosevelt University; M.A., Ph.D., University of Chicago
- RICHARD E. GARDNER
Assistant Professor of Anthropology
A.A., Los Angeles City College; A.B., M.A., Ph.D., University of California at Los Angeles
- MICHAEL S. GAZZANIGA
Professor of Psychology, and Professor of Social Sciences in Medicine
A.B., Dartmouth College; Ph.D., California Institute of Technology
- JAMES H. GEER
Professor and Chairman, Department of Psychology
B.S., M.S., Ph.D., University of Pittsburgh
- SIDNEY GELBER
Professor of Philosophy and Academic Vice President
B.A., M.A., Ph.D., Columbia University
- HERBERT L. GELERNTER
Professor of Engineering and Computing Center Associate
B.S., Brooklyn College; Ph.D., University of Rochester
- JOSEPH S. GELMIS
Adjunct Assistant Professor of Theatre Arts
B.A., Brooklyn College; M.S., Columbia University
- CHRISTOPHER S. GEORGE
Part-time Visiting Associate Professor of Religious Studies
B.S., Columbia University; Ph.D., University of Pennsylvania
- IRVING GERST
Professor of Applied Mathematics and Statistics
B.S., City College of New York
M.A., Ph.D., Columbia University
- RAYMOND F. GESTELAND
Adjunct Associate Professor of Biological Sciences (Joint Appointment with Cold Spring Harbor Laboratory for Quantitative Biology, Cold Spring Harbor, N.Y.)
B.S., M.S., University of Wisconsin; Ph.D., Harvard University
- JAIME A. GIORDANO
Associate Professor of Spanish & Chairman, Department of Hispanic Languages & Literature
Profesor de Estado, Chile
- BENTLEY GLASS
Distinguished Professor of Biological Sciences
B.A., M.A., Baylor University; Ph.D., University of Texas; Sc.D., Washington College, Western Reserve University; LL.D., Baylor University
- DAVID GLAZER
Performing Artist in Residence, and Part-time Lecturer in Music
B.Ed., University of Wisconsin, Milwaukee
- AARON W. GODFREY
Part-time Lecturer in the Program of Classics and Project Director in the

- Office of Vice President for Student Affairs*
B.A., Fordham University; M.A., Hunter College
- ISRAEL GOHBERG
Visiting Professor of Mathematics
Doctor of Science, Moscow State University; Corresponding Member (elected), Moldavian Academy of Sciences
- ALLEN N. GOLAND
Part-time Adjunct Professor of Materials Science
Ph.D., Northwestern University
- HOMER B. GOLDBERG
Professor of English
B.A., A.M., Ph.D., University of Chicago
- MARK GOLDEN
Part-time Visiting Associate
A.A., Los Angeles City College; B.A., Ph.D., University of California at Los Angeles
- THEODORE D. GOLDFARB
Associate Professor of Chemistry
A.B., Cornell University; Ph.D., University of California, Berkeley
- MARVIN R. GOLDFRIED
Professor of Psychology
B.A., Brooklyn College; Ph.D., State University of New York at Buffalo
- ALFRED S. GOLDHABER
Associate Professor of Physics and Member, Institute for Theoretical Physics
B.A., Harvard University; Ph.D., Princeton University
- MAURICE GOLDHABER
Adjunct Professor of Physics and Member, Institute for Theoretical Physics
Ph.D., Cambridge University, England
- JEANINE M. GOLDMAN
Lecturer in French
B.A., Hunter College; M.A., Ph.D., Fordham University
- MYRON L. GOOD
Professor of Physics
B.A., University of Buffalo; Ph.D., Duke University
- ERICH GOODE
Associate Professor of Sociology
B.A., Oberlin College; Ph.D., Columbia University
- NORMAN GOODMAN
Professor and Chairman, Department of Sociology
B.A., Brooklyn College; M.A., Ph.D., New York University
- MARSHALL B. GORDON
Assistant Professor of Education
B.A., Hunter College, CUNY; M.A., Ph.D., Teacher's College, Columbia University
- LEE H. GOUCH
Part-time Lecturer, College of Arts and Sciences
B.A., Vanderbilt University; M.Sc., Brown University
- ERLEND H. GRAF
Associate Professor of Physics
S.B., Massachusetts Institute of Technology; Ph.D., Cornell University
- JOHN B. GRAHAM
Performing Artist in Residence and Part-time Lecturer in Music
B.A., University of California, Berkeley
- RICHARD M. GRAMLY
Lecturer in Anthropology
B.S., Rensselaer Polytechnic Institute; A.M., Ph.D., Harvard University
- RICHARD GRAN
Part-time Visiting Associate Professor of Applied Mathematics and Statistics
B.S.E.E., M.S.E.E., Ph.D., Polytechnic Institute of Brooklyn
- PAUL D. GRANNIS
Professor of Physics
B.E.P., Cornell University; Ph.D., University of California, Berkeley
- GABRIELA GREENFIELD
Lecturer in Portuguese
B.A., University of Massachusetts; M.A., New York University
- BERNARD GREENHOUSE
Performing Artist in Residence and Part-time Lecturer in Music
Diploma, Juilliard School of Music; Diploma, Juilliard Graduate School
- NORMAN GREENSPAN
Part-time Visiting Lecturer in Applied Mathematics and Statistics
B.A., Brooklyn College; M.M.E., Polytechnic Institute of Brooklyn
- BERNARD N. GROFMAN
Assistant Professor of Political Science
B.S., M.A., Ph.D., University of Chicago

- DETLEF GROMOLL
Professor of Mathematics
Vordiplom. Diplom, Dr. (rer. nat.),
University of Bonn
- MIKHAELL GROMOV
Professor of Mathematics
Doctor of Math. Science, Leningrad
University
- KIRSTEN A. GRONBJERG
Assistant Professor of Sociology
B.A., Pitzer College; M.A.,
University of Chicago
- WILLIAM C. GROOM
Assistant Professor of Theatre Arts
B.A., Southeastern State College;
M.F.A., Tulane University
- HARVEY S. GROSS
Professor of Comparative Literature
B.A., M.A., University of California at
Los Angeles; Ph.D., University of
Michigan
- ROBERT J. GROSS
Assistant Professor of Education
A.B., Swarthmore College; M.A.T.,
Ed.D., Harvard Graduate School of
Education
- LEONARD J. GUARDINO
*Part-time Adjunct Associate Professor,
Program in Youth and Community
Studies*
B.A., Brooklyn College; M.S.W.,
Adelphi University
- JACQUES GUILMAIN
*Professor and Chairman,
Department of Art*
B.S., Queens College; M.A.,
Ph.D., Columbia University
- OSCAR A. HAAC
Professor of French
B.A., M.A., Ph.D., Yale University
D.U., University of Paris
- JAMES W. HAGEN
*Coordinator of General Chemistry
Laboratories and Lecturer in
Chemistry*
B.A., Macalester College; M.A.
Clarkson College of Technology
- DONALD J. HAGGERTY
Lecturer in Education
B.S., City College of New York;
M.S., Florida State University
- ALBERT HAIM
Professor of Chemistry
Industrial Chemist, University of
Uruguay; Ph.D., University of
Southern California
- LASZLO HALASZ
*Part-time Adjunct Professor of
Education*
Franz Liszt Academy of Music,
Budapest
- MAURICE HALIOUA
*Adjunct Assistant Professor of
Engineering*
B.Sc., University of Bordeaux;
Diploma, Institute of Optics; Ph.D.,
University of Paris
- BEATRICE L. HALL
*Assistant Professor and Chairman,
Linguistics Program*
B.A., Brooklyn College; M.A.,
Ph.D., New York University
- DAVID M. HANSON
Professor of Chemistry
B.A., Dartmouth College; Ph.D.,
California Institute of Technology
- GILBERT N. HANSON
Associate Professor of Geochemistry
B.A., M.S., Ph.D., University of
Minnesota
- MARTHA HANSON
Assistant Librarian
B.A., Lawrence University; M.L.S.,
C. W. Post
- JOHANNES HARDORP
*Associate Professor of Astronomy-
Astrophysics*
Ph.D., Hamburg University, Germany
- STEWART M. HARRIS
Associate Professor of Engineering
B.S.E.S., Case Institute of Technology;
M.S., Ph.D., Northwestern University
- SHELLEY HARRISON
Assistant Professor of Engineering
B.E.E., New York University; M.S.,
Ph.D., Polytechnic Institute of
Brooklyn
- JACK B. HARTUNG
*Adjunct Associate Professor of Earth
and Space Sciences*
B.S., Iowa State University;
Ph.D., Rice University
- RICHARD HARTZELL
Associate Professor of Theatre Arts
B.S., Lock Haven State College;
M.A., Pennsylvania State University

- HOWARD J. HARVEY
Assistant Professor of English
B.A., Loyola University; A.M.,
University of Michigan
- SHAHIM HASHTROUDI
Part-time Lecturer in Psychology
B.A., American University of Beirut
- RICHMOND Y. HATHORN
Professor and Chairman of Classics
B.A., Louisiana College; M.S.,
Louisiana State University;
Ph.D., Columbia University
- GEORGE J. HECHTEL
*Associate Professor of Biological
Sciences*
B.S., Ph.D., Yale University
- W. EUGENE HEDLEY
*Associate Professor of Education &
Chairman, Department of Education*
A.A., Glendale City College; B.A.,
M.A., University of Southern California;
Ph.D., Claremont Graduate School
- PATRICK AIDAN HEELAN
*Professor of Philosophy, and Acting
Vice President for Liberal Studies*
B.A., M.A., National University of
Ireland, Dublin; Ph.D., University of
Louvain, Belgium; Ph.D., St. Louis
University
- JACK HELLER
Professor of Engineering
B.Ae.E., M.Ae.E., Ph.D., Polytechnic
Institute of Brooklyn
- PAUL M. HELQUIST
Assistant Professor of Chemistry
B.A., University of Minnesota; M.S.,
Ph.D., Cornell University
- PETER B. HENDERSON
*Assistant Professor of Computer
Science*
B.S.E.E., M.S.E.E., Clarkson College
of Technology; Ph.D., Princeton
University
- PAGET E. HENRY
Lecturer in Sociology
A.A., Bronx Community College;
B.A., City College; M.A., Ph.D.,
Cornell University
- PATRICK J. HERLEY
Associate Professor of Engineering
Ph.D., Rhodes University, South Africa;
Ph.D., Imperial College, London
- HERBERT HERMAN
Professor of Engineering, and
*Chairman, Department of Materials
Science*
B.S., DePaul University; M.S., Ph.D.,
Northwestern University
- DAVID HICKS
Associate Professor of Anthropology
B.A., University of Wales; Dip.
Anthrop., B. Litt., University of Oxford;
Ph.D., University of London; D. Phil.,
University of Oxford
- NOBUYOSHI HIGASHI
*Part-time Instructor in Physical
Education*
B.A., Kokushikan University, Japan
- C. DENSON HILL
Professor of Mathematics
B.A., Rice University; M.S., Ph.D.,
New York University, Courant Institute
of Mathematical Sciences
- PATRICK J. HILL
Associate Professor of Philosophy
B.A., Queens College; M.A., Ph.D.,
Boston University
- WILLIAM S. HILLMAN
*Adjunct Professor of Biological
Sciences*
B.S., Yale University; M.S., University
of Wisconsin; Ph.D. Yale University
- NOBORU HIROTA
Professor of Chemistry
B.S., Kyoto University;
Ph.D., Washington University
- ROBERT W. HODGE
Professor of Sociology
B.A., Reed College; M.A., Ph.D.,
University of Chicago
- CHARLES HOFFMANN
Professor of Economics
B.A., Queens College; M.A.,
Ph.D., Columbia University
- JOSEPH S. HOGAN
Associate Professor of Engineering
B.S., Fordham University; Ph.D.,
New York University
- PETER J. HOULE
Assistant Professor of English
B.A., St. Michael's College; M.A.,
Ph.D., University of Massachusetts
- RICHARD HOWARD
Associate Professor of Philosophy
B.A., Rice University; M.A., Ph.D.,
University of Texas

- SIR FRED HOYLE
Visiting Professor of Astronomy
Mathematical Tripos, Emmanuel
College, Cambridge; M.A., St. John's
College, Cambridge University; D.Sc.,
University of Norwich; D.Sc.,
University of Leeds
- SHI MING HU
*Assisat Professor of Asian Studies
and Chinese*
B.A., National Amoy University;
B.Ed., Taiwan Normal University; M.A.,
West Virginia University; Ed.D.
Columbia University
- TERRY E. HUBBARD
Assistant Librarian, Reference
B.A., University of Vermont; M.A.,
San Francisco State College; M.L.S.,
University of California at Los Angeles
- CLIFFORD C. HUFFMAN
Associate Professor of English
B.A., Columbia College; M.A., Clare
College, Cambridge University,
England; Ph.D., Columbia University
- DONALD IHDE
*Professor and Chairman, Department
of Philosophy*
B.A., University of Kansas; B.D.,
Andover Newton Theological School;
Ph.D., Boston University
- PAUL INGRAHM
Part-time Lecturer in Music
B.S., Ithaca College
- MASAYORI INOUYE
Professor of Biochemistry
B.A., M.A., Ph.D., Osaka University
- THOMAS F. IRVINE, JR.
Professor of Engineering
B.S., Pennsylvania State University;
M.S., Ph.D., University of Minnesota
- JOSEPH JACH
Associate Professor of Engineering
B.Sc., M.Sc., University of Cape Town,
South Africa; D.Phil (Oxon.),
University of Oxford
- ANDREW D. JACKSON
Professor of Physics
B.A., M.A., Ph.D., Princeton University
- IRMA B. JAFFE
Part-time Professor of Art
B.S., M.A., Ph.D., Columbia University
- ESTELLE JAMES
Professor of Economics
B.A., Cornell University; Ph.D.,
Massachusetts Institute of Technology
- GEORGE J. JEFFREY
Adjunct Professor of Chemistry
B.Sc., Ph.D., University of Birmingham,
United Kingdom
- JOSEPH C. JENKINS
Lecturer in Sociology
B.A., University of Texas; M.A.,
SUNY at Stony Brook
- FRANCIS JOHNSON
*Professor of Chemistry and
Pharmacological Sciences*
B.Sc., Ph.D., University of Strathclyde
- MARCIA K. JOHNSON
Associate Professor of Psychology
B.A., Ph.D., University of
California, Berkeley
- PHILIP M. JOHNSON
Associate Professor of Chemistry
B.S., University of Washington;
Ph.D., Cornell University
- FRANCO P. JONA
Professor of Engineering
Diplom Physics, Ph.D., Eidgenossische
Technische Hochschule
- ALDONA JONAITIS
Lecturer in Art
B.A., State University of New York at
Stony Brook; M.A., Columbia
University
- LOWELL E. JONES
Associate Professor of Mathematics
B.A., Reed College; Ph.D., Yale
University
- RAYMOND F. JONES
Professor of Biological Sciences
B.Sc., Ph.D., Kings College, University
of Durham (Newcastle Division),
England
- REX JONES
Assistant Professor of Anthropology
A.B., M.A., Ph.D., University of
California at Los Angeles
- HANS JOSTLEIN
Assistant Professor of Physics
Dipl. Eng. Physics, Technische
Hochschule, München; Ph.D.
Universität München
- THOMAS O. JUKAM
Lecturer in Political Science

- B.A., University of Minnesota; M.A., San Francisco State College
- NORMAN O. JUNG**
Librarian, Head of Reference Department
A.B., Oberlin College; A.M., University of Chicago; M.A., Indiana University
- TOMAS KAFKA**
Research Associate in Physics
Ph.D., SUNY at Stony Brook
- PETER B. KAHN**
Professor and Chairman, Department of Physics
B.S., Union College, Ph.D., Northwestern University
- AMY L. KAISER**
Assistant Professor of Music
A.B., Smith College; M.A., Columbia University
- CECILIA KALFUR**
Instructor in Physical Education
B.S., Kent State University
- GILBERT KALISH**
Performing Artist in Residence and Part-time Lecturer, Department of Music
B.A., Columbia University
- HARRY I. KALISH**
Professor of Psychology and Director, Institute for Research in Learning and Instruction
B.A., M.A., Ph.D., State University of Iowa
- PETER J. KALMAN**
Professor of Economics and Applied Mathematics and Statistics
B.A., City College of New York; M.S., Ph.D., Purdue University
- MARJORIE L. KANDEL**
Lecturer in Chemistry
B.A., M.S., Indiana University
- MICHAEL T. KANE**
Assistant Professor of Education
B.S., Manhattan College; M.A., State University of New York at Stony Brook; M.S., Ph.D., Stanford University
- ELIYAHU KANOVSKY**
Associate Professor of Economics
B.A., Yeshiva University; Ph.D., Columbia University
- YI-HAN KAO**
Professor of Physics
B.S., National Taiwan University; M.S., Oklahoma State University; Ph.D., Columbia University
- ELAINE KAPLAN**
Assistant Professor of Education
B.A., Queens College; M.S., City College of New York
- HARRIET G. KAPLAN**
Adjunct Assistant Professor of Psychology
B.A., Hunter College; M.S., Ph.D., New York University
- SIMON KARASICK**
Director of the University Band and Part-time Lecturer, Department of Music
B.M., Eastman School of Music
- ROMAN KARST**
Professor of German, Russian and Comparative Literature
M.L.L., Jagiellonski University
- EUGENE KATZ**
Associate Professor of Biological Sciences and recipient of the Chancellor's Award for Excellence in Teaching ('74-'75)
B.S., University of Wisconsin; Ph.D., University of Cambridge, England
- JOSEPH KATZ**
Professor of Human Development and Director of Research for Human Development and Educational Policy
A.B., William Jewell College; M.A., University of Pennsylvania; Ph.D., Columbia University
- HERBERT KAYE**
Associate Professor of Psychology
B.Sc., Columbia University; M.Sc., Ph.D., Brown University
- RUBEN D. KAZTMAN**
Adjunct Associate Professor of Sociology
M.A., University of California at Berkeley
- HOWARD R. KELMAN**
Professor of Education, Adjunct Professor of Sociology, and Professor in the Division of Social Science and Humanities, Health Science Center
B.A., Brooklyn College; M.S., Columbia University; Ph.D., New York University
- THEODORE R. KENNEDY**
Assistant Professor of Anthropology
B.A., University of Washington; Ph.D., Princeton University

- DONALD N. KENT
*Visiting Assistant Professor in the
Institute for Research in Learning and
Instruction and Psychology*
B.S., University of Illinois; Ph.D.,
State University of New York at
Stony Brook
- ROBERT C. KERBER
Associate Professor of Chemistry
S.B., Massachusetts Institute of
Technology; Ph.D., Purdue University
- CAROLE S. KESSNER
*Part-time Assistant Professor of
English*
B.A., Brandeis University; M.A.,
Queens College
- RICHARD B. KIEBURTZ
*Professor of Engineering and
Chairman, Department of Computer
Science*
B.S.E.E., M.S.E.E., Ph.D., University of
Washington
- WOO JONG KIM
*Associate Professor of Applied
Mathematics and Statistics*
B.S. in Ch.E., Seoul National
University; M.S. in Ch.E., Oklahoma
State University; Ph.D. in Ch.E., M.S.
in Math., Carnegie Institute of
Technology; Ph.D. in Math.,
Carnegie-Mellon University
- JANOS KIRZ
Professor of Physics
B.A., Ph.D., University of California,
Berkeley
- JAMES H. KLEEGER
Associate Professor of Art
B.F.A., Syracuse University
- ELLIOT KLEINMAN
*Research Associate for Planning in
the Center for Legal Studies*
B.S., New York University, School of
Commerce; Juris Doctor, Brooklyn
Law School
- RICARDO KLORMAN
*Visiting Associate Professor of
Sociology*
B.A., M.A., Ph.D., University of
California at Los Angeles
- ROGER F. KNACKE
Associate Professor of Astronomy
B.A., Ph.D., University of
California, Berkeley
- ELLIS KOCH
*Part-time Adjunct Assistant Professor
of Environmental Studies*
B.S., Brooklyn College; M.S.,
Virginia Polytechnic Institute &
University
- RICHARD K. KOEHN
*Associate Professor of Biological
Sciences*
B.A., Western Michigan University;
Ph.D., Arizona State University
- CONSTANCE KOPPELMAN
*Assistant Librarian, Reference and
Adjunct Lecturer in Art*
B.A., State University of New York
at Stony Brook; M.L.S., Queens
College
- LEE E. KOPPELMAN
Part-time Professor of Political Science
B.E.E., City College of New York;
M.S.C.P., Pratt Institute; D.P.A.,
New York University
- GEORGE KORAS
Professor of Art
Diploma, Academy of Fine Arts in
Athens
- EDWARD M. KOSOWER
Adjunct Professor of Chemistry
S.B., Massachusetts Institute of
Technology; Ph.D., University of
California at Los Angeles
- JAN KOTT
*Professor of Comparative Literature
and English*
Master of Law, University of Warsaw;
Ph.D., Lodz University
- FRANCOISE KOURILSKY
Visiting Professor of Theatre Arts
B.A., M.A., Ph.D., Sorbonne
- IRWIN KRA
*Professor and Chairman, Department
of Mathematics*
B.S., Brooklyn Polytechnic Institute,
Ph.D., Columbia University
- RICHARD A. KRAMER
Associate Professor of Music
B.A., Tufts University; M.A.,
Brooklyn College; M.F.A., Ph.D.,
Princeton University
- THOMAS KRANIDAS
Professor of English
B.A., University of Washington; A.M.,
Columbia University; Ph.D., University
of Washington

- ALLEN KRANTZ
Associate Professor of Chemistry
B.A., City College of New York;
Ph.D., Yale University
- LEONARD KRASNER
Professor of Psychology
B.A., City College of New York;
M.A., Ph.D., Columbia University
- JACK KREISELMAN
*Performing Artist in Residence and
Part-time Lecturer, Department of
Music*
Manhattan School of Music; Pupil of
Simeon Bellison and Simon Kovar
- MORTIMER KREUTER
*Professor of Education and Acting
Dean of the Center for Continuing and
Developing Education*
B.A., Brooklyn College; M.A., Ed.D.,
Teachers College, Columbia
University
- ABRAHAM D. KRIKORIAN
*Associate Professor of Biological
Sciences*
B.S., Massachusetts College of
Pharmacy; Ph.D., Cornell University
- MARVIN M. KRISTEIN
*Associate Professor of Economics and
Director of Economic Research Bureau*
B.S.S., City College of New York;
M.A., Columbia University; Ph.D.,
New School for Social Research
- SUSAN P. KRUPSKI
*Assistant Professor of Physical
Education*
B.S., University of Bridgeport;
M.S., Smith College
- MICHIO KUGA
Professor of Mathematics
B.A., Ph.D., University of Tokyo
- RICHARD F. KUISEL
Associate Professor of History
B.A., University of Michigan; M.A.,
Ph.D., University of California,
Berkeley
- PAUL KUMPEL
Associate Professor of Mathematics
B.S., Trenton State College; Ph.D.,
Brown University
- ARTHUR H. KUNZ
*Part-time Professor of Political
Science*
B.S., M.S., Virginia Polytechnic
Institute
- THOMAS T.S. KUO
Professor of Physics
B.S., National College of Engineering,
Taiwan; M.S., National Tsing Hua
University; Ph.D., University of
Pittsburgh
- SAMUEL J. KURSH
Lecturer in Urban and Policy Sciences
B.E.A., University of Delaware;
M.E.A., George Washington University
- JOHN YING-KUEN KWAN
*Assistant Professor of Earth and
Space Sciences*
B.S., Utah State University; Ph.D.,
California Institute of Technology
- ANDY S. KYDES
*Visiting Assistant Professor of Urban
and Policy Sciences*
B.A., Harvard University; M.S., Ph.D.,
SUNY at Stony Brook
- G. NORMAN LAIDLAW
Professor of French
B.A., Mount Allison University;
B.A., M.A., Oxford University; Ph.D.,
Columbia University; F.R.S.A.
(London)
- EDWARD D. LAMBE
Professor of Physics
B.A.Sc., M.A.Sc., University of British
Columbia; Ph.D., Princeton University
- ERIC E. LAMPARD
Professor of History
B.Sc., University of London; Ph.D.,
University of Wisconsin
- MARK L. LANDIS
*Visiting Assistant Professor of
Political Science*
B.A., City College of New York;
Ph.D., Columbia University
- MICHELE J. F. LANE
Lecturer in French
B.A., M.A., Hunter College
- GLADYS E. LANG
*Professor of Sociology and
Communication*
A.B., University of Michigan; M.A.,
University of Washington; Ph.D.,
University of Chicago
- KURT LANG
Professor of Sociology
B.A., M.A., Ph.D., University of
Chicago
- EDWARD P. LANNING
Professor of Anthropology

- A.B., Ph.D., University of California, Berkeley
- A. WILLIAM LARSON
Part-time Assistant Professor of Continuing and Developing Education
B.A., Dartmouth College; J.D., Syracuse University
- KENNETH D. LASER
Assistant Professor of Biological Sciences
B.S., Ferris State College; M.A. University of Northern Iowa; Ph.D., Iowa State University
- PEDRO LASTRA
Professor of Spanish
University Professor of Spanish, University of Chile
- HENRY B. LAUFER
Associate Professor of Mathematics
B.S., Ph.D., City College of New York
- JOSEPH W. LAUHER
Assistant Professor of Chemistry
B.A., Illinois Wesleyan University; Ph.D., Northwestern University
- PAUL C. LAUTERBUR
Professor of Chemistry
B.S., Case Institute of Technology; Ph.D., University of Pittsburgh
- DAVID LAWTON
Associate Professor of Music
B.A., Ph.D., University of California, Berkeley
- BILLY JIM LAYTON
Professor of Music
B.M., New England Conservatory of Music; M.M., Yale University; Ph.D., Harvard University
- HERMAN E. LBOVICS
Associate Professor of History
B.A., University of Connecticut; M.A., Ph.D., Yale University
- VICTORIA S. LBOVICS
Part-time Lecturer in French and Italian
B.A., Swarthmore College; Ph.D., Yale University
- BENJAMIN W. LEE
Professor of Physics and Member, Institute for Theoretical Physics
B.S., Miami University; M.S., University of Pittsburgh; Ph.D., University of Pennsylvania
- EDWARD T. LEE
Assistant Professor of Engineering
B.S., National Taiwan University; M.S., Ph.D., University of California, Berkeley
- KENNETH C. LEE
Assistant Professor of Physical Education
B.S., Cortland State Teachers College; M.S., Hofstra University
- LINWOOD L. LEE, JR.
Professor of Physics and Director, Nuclear Structure Laboratory
B.A., Princeton University; M.S., Ph.D., Yale University
- RICHARD SHAO-LIN LEE
Professor of Engineering and Chairman, Department of Mechanics
B.S., National Taiwan University; M.S., North Carolina State College; Ph.D., Harvard University
- ROBERT H. G. LEE
Associate Professor of History and Chairman, Asian Studies Program
B.A., University of Hawaii; M.A., Harvard University; Ph.D., Columbia University
- JULIET LEE-FRANZINI
Professor of Physics
B.A., Hunter College; M.A., Ph.D., Columbia University
- SYBIL LEFFERTS
Part-time Lecturer in Social Sciences
A.B., Sarah Lawrence College; Ed.M., Harvard University
- LESTER LEFKOWITZ
Part-time Adjunct Assistant Professor of Art
B.S., State University of New York at Stony Brook; M.S., University of Rochester
- MARTIN A. LEIBOWITZ
Associate Professor of Applied Mathematics and Statistics
B.A., Columbia College; M.A., Ph.D., Harvard University
- HELEN RODNITE LEMAY
Assistant Professor of History
B.A., Bryn Mawr College; M.A., Ph.D., Columbia University
- JAMES S. LEMING
Assistant Professor of Education
B.A., M.A., University of Illinois; Ph.D., University of Wisconsin

- WILLIAM J. LE NOBLE
Professor of Chemistry
B.S., Advanced Technical School,
Dordrecht, Netherlands; Ph.D.,
University of Chicago
- CHARLES M. LENT
*Associate Professor of Biological
Sciences*
B.S., East Stroudsburg State College;
Ph.D., University of Delaware
- JOHN LESSARD
Professor of Music
Diploma, Ecole Normale; Diploma,
Longy School of Music
- ELENA LESSER
Part-time Lecturer in Education
B.A., Brandeis University; M.A.T.,
Harvard University
- PHYLLIS LEVENSTEIN
*Part-time Adjunct Associate Professor
of Education and Institute for
Research in Learning & Instruction*
B.S., M.S.S.W., Wayne State
University; Ed.D., Teachers College,
Columbia University
- RICHARD L. LEVIN
Professor of English
B.A., M.A., Ph.D., University of
Chicago
- FREDERIC M. LEVINE
Associate Professor of Psychology
B.A., City College of New York; M.A.,
Ph.D., Northwestern University
- MARVIN LEVINE
Professor of Psychology
B.A., Columbia University; M.A.,
Harvard University; Ph.D., University
of Wisconsin
- RICHARD A. LEVINE
*Professor and Chairman, Department
of English*
B.A., University of Massachusetts;
M.A., University of Connecticut;
Ph.D., Indiana University
- ROBERT M. LEVINE
Associate Professor of History
B.A., Colgate University; M.A.
Ph.D., Princeton University
- SUMNER N. LEVINE
Professor of Engineering
B.S., Brown University; Ph.D.,
University of Wisconsin
- JEFFREY S. LEVINTON
*Associate Professor of Biological
Sciences*
B.S., Ph.D., Yale University
- ALAN B. LEVY
Assistant Professor of Chemistry
A.A. San Francisco City College; B.S.,
University of California, Berkeley;
Ph.D., University of Colorado
- DAVID LEWIN
Professor of Music
B.A., Harvard University;
M.F.A., Princeton University
- THOMAS T. LIAO
Assistant Professor of Engineering
B.A., Brooklyn College;
M.S., Adelphi University;
Ed.D., Teacher's College,
Columbia University
- DAVID LICHTENSTEIN
Lecturer in Education
B.A., Reed College; M.S.,
Bank Street College of Education
- CLARA E. LIDA
*Associate Professor of Hispanic
Languages and History*
B.A., Brandeis University; M.A.,
El Colegio de Mexico; Ph.D.,
Princeton University
- THEODORE I. LIDSKY
Assistant Professor of Psychology
B.A., Queens College, CUNY; Ph.D.,
University of Rochester
- ROBERT M. LIEBERT
Professor of Psychology
B.S., Tulane University;
Ph.D., Stanford University
- ARTHUR LIEBMAN
*Part-time Assistant Professor of
English*
B.A., M.A., Brooklyn College; Ph.D.,
New York University
- CLAIRE LINDGREN
Lecturer in Art
A.A.S., Fashion Institute of
Technology; B.A., State University
of New York at Stony Brook; A.M.,
M. Phil. Columbia University
- DONALD H. LINDSLEY
Professor of Petrology
B.A., Princeton University; Ph.D.,
Johns Hopkins University
- JACOB LIPKIND
*Associate Librarian, Assistant Head of
Reference Department*
B.A., M.S. in L.S., Columbia University

- CORINE LIPSET
Lecturer in Education
B.S., City College of New York;
M.S., Hofstra University
- AARON LIPTON
Associate Professor of Education
B.S., M.A., Ed.D., New York University
Certificates: Secondary Social Studies
NYS, Common Branches K-6 NYS,
Elementary Principal NYS, Super-
intendent NYS, School Psychologist
NYS
- WILLIAM G. LISTER
Professor of Mathematics
B.A., Ph.D., Yale University
- WILLIAM T. LITTLE
*Assistant Professor of Hispanic
Languages*
B.A., San Fernando Valley State
College; M.A., Indiana University;
Ph.D., Washington University
- JOHN M. LIU
*Adjunct Assistant Professor of
Material Science*
B.Sc., St. Vincent College; M.Eng.Sc.,
Ph.D., The Johns Hopkins University
- VICENTE LLORENS
Professor of Spanish
Ph.D., University of Madrid
- ROBERT R. LOBOU
Assistant Librarian
B.A., Queens College; M.A.,
University of Connecticut; A.B.D.,
M.S.L.S., Syracuse University
- MILTON G. LODGE
*Associate Professor of Political
Science*
B.A., M.A., New York University;
Ph.D., University of Michigan
- JOHN R. LOGAN
Assistant Professor of Sociology
B.A., University of California, Berkeley;
M.A., Columbia University
- JACK LUDWIG
Professor of English
B.A., University of Manitoba; Ph.D.,
University of California at Los Angeles
- GEORGE LUKEMIRE
*Part-time Instructor in Physical
Education*
B.S., Cornell University
- JAMES E. LUKENS
Assistant Professor of Physics
B.S., Stanford University; M.S., Ph.D.,
University of California, San Diego
- LEWIS LUSARDI
*Artist in Residence and Adjunct
Assistant Professor of Art; Director,
Center for Contemporary Arts &
Letters*
B.A., University of London
- BARRY LUTZ
*Adjunct Associate Professor of
Astronomy*
Ph.D., Princeton University
- HARVARD LYMAN
*Associate Professor of Biological
Sciences*
B.A., University of California, Berkeley,
M.S., University of Washington;
Ph.D., Brandeis University
- TERRY J. LYNCH
Lecturer in Education
B.S., M.Ed., Xavier University
- MICHAEL P. MCCARTHY
Assistant Professor of History
A.B., Princeton University; M.A.T.,
Johns Hopkins University; Ph.D.,
Northwestern University
- ROBERT L. MCCARTHY
Assistant Professor of Physics
B.A., Harvard College; M.S., Ph.D.,
University of California, Berkeley
- GARY McCLURE
*Adjunct Assistant Professor of
Psychology*
B.A., Wake Forest University; M.A.,
University of North Carolina; Ph.D.,
University of Vermont
- JOHN McCONNELL
*Clinical Associate, Department of
Psychology*
Ph.D., University of Rochester
- BARRY M. McCOY
*Associate Professor of Physics and
Member, Institute for Theoretical
Physics*
B.A., California Institute of
Technology; Ph.D., Harvard University
- DALE M. McDANIEL
Assistant Professor of Chemistry
B.S., University of California, Davis;
Ph.D., Columbia University
- JOHN J. McDERMOTT
*Part-time Visiting Professor of
Philosophy*
B.A., St. Francis College; M.A., Ph.D.,
Fordham University

- ROBERT L. McGRATH
Professor of Physics
B.A., Oberlin College; M.S., Ph.D.,
University of Iowa
- JOHN L. McHUGH
*Professor of Marine Sciences
Research Center*
B.A., M.A., University of British
Columbia; Ph.D., University of
California at Los Angeles
- JAMES B. McKENNA
*Associate Professor of Spanish and
Director, Academic Planning*
B.A., Princeton University; M.A.,
Ph.D., Harvard University
- DAVID W. McMULLEN
*Lecturer in Education and
Associate, Institute for Research in
Learning and Instruction*
B.D., Fuller Theological Seminary;
M.R.E., Golden Gate Theological
Seminary; Ph.D., Stanford University
- MARIAN L. MacDONALD
Assistant Professor of Psychology
A.B., Auburn University; M.A., Ph.D.,
University of Illinois
- JACKSON T. MAIN
Professor of History
B.A., M.A., Ph.D., University of
Wisconsin
- JAMES A. MAIORANA
Instructor in Mathematics
B.S., California Institute of
Technology; Ph.D., Princeton
University
- ELIZABETH J. MALLON
*Assistant Professor of Biological
Sciences*
B.Sc., University of Nebraska; M.S.,
University of Detroit; Ph.D., University
of Michigan
- NINA A. MALLORY
Associate Professor of Art
B.Arch., M.A., Ph.D., Columbia
University
- JOSEPH L. MANISCALCO
*Part-time Adjunct Associate Professor
of Youth and Community Studies*
B.A., M.A., City College of the
City of New York
- ROBERT D. MARCUS
*Associate Professor of History, and
Dean for Undergraduate Studies*
B.A., M.A., Columbia University;
Ph.D., Northwestern University
- THOMAS E. MARESCA
Associate Professor of English
B.A., St. Peter's College; M.A.,
Ph.D., Johns Hopkins University
- NANCY S. MARSALA
*Part-time Lecturer in Continuing and
Developing Education*
B.S., SUNY at Fredonia
- VELIO A. MARSOCCI
*Professor and Acting Associate Dean,
College of Engineering*
B.E.E., M.E.E., Eng.Sc.D.,
New York University
- MICHAEL A. MART
*Part-time Lecturer in the Social
Science Program*
A.A., Merritt College; B.A.,
University of California, Berkeley;
M.A., SUNY at Stony Brook
- BERNARD MASKIT
Professor of Mathematics
B.A., M.S., Ph.D., New York University
- LOUIS MASLINOFF
Assistant Professor of Education
B.S., University of Illinois; M.S.,
University of Miami; Ed.T., Teachers
College, Columbia University
- ROBERT H. MEADE, JR.
Adjunct Professor of Marine Sciences
B.S., University of Oklahoma; M.S.,
Ph.D., Stanford University
- LEONARD E. MELL
*Lecturer in Youth and Community
Studies*
B.A., M.S.W., SUNY at Stony Brook
- EMIL MENZEL, JR.
Professor of Psychology
B.A., Elmhurst College; M.A.,
University of Michigan; Ph.D.,
Vanderbilt University
- ROBERT W. MERRIAM
*Associate Professor of Biological
Sciences*
B.A., State University of Iowa; M.S.,
Oregon State College; Ph.D.,
University of Wisconsin
- JUAN E. MESTAS
*Lecturer and Chairman of Program in
Puerto Rican Studies*
B.A., University of Puerto Rico
- HAROLD J. METCALF
Associate Professor of Physics

- S.B., Massachusetts Institute of Technology; Ph.D., Brown University
- URSULA E. C. MEYER
Part-time Adjunct Lecturer in Germanic & Slavic Languages
Staatsexamen, University of Hamburg
- WOLFGANG MEYER
Professor of Mathematics
Diplom, Dr., University of Bonn
- WILLIAM J. MEYERS
Assistant Professor of Sedimentary Geology
B.A., University of Colorado; M.A., University of California, Berkeley; Ph.D., Rice University
- PAULINE MICCICHE
Associate Librarian, Serials
B.A., State University of New York at Buffalo; M.S., Canisius College; M.S.L.S., Case Western Reserve University
- MARIO MIGNONE
Assistant Professor of Italian
B.A., City College of New York; M.A., Ph.D., Rutgers University
- CLYDE LEE MILLER
Assistant Professor of Philosophy
B.A., M.A., Ph.L., St. Louis University; S.T.L., St. Louis University Divinity School
- RUTH MILLER
Professor of English and Comparative Literature, Assistant Academic Vice President
B.A., M.A., University of Chicago; Ph.D., New York University
- WILBUR R. MILLER, JR.
Assistant Professor of History
B.A., University of California at Berkeley; M.A., Ph.D., Columbia University
- LEONARD R. MILLS
Associate Professor of Italian
B.A., Brown University; Litt.D., University of Rome; Ph.D., Columbia University
- THOMAS MOGER-WILLIAMS
Lecturer in Experimental College
B.A., Williams College; M.S.W., New York University
- KRISTEN R. MONROE
Assistant Professor of Political Science
A.B., Smith College; M.A., Ph.D., University of Chicago
- CARL MOOSS
Associate Professor of Biological Sciences
S.B., Massachusetts Institute of Technology; Ph.D., Columbia University
- JACK J. MORAVA
Assistant Professor of Mathematics
Ph.D., Rice University
- MASATAKA MORI
Part-time Instructor in Physical Education
B.A., Takushoku University, Japan
- H. WILLIAM MORRISON
Associate Professor of Psychology and Associate, Institute for Research in Learning and Instruction
B.A., Haverford College; M.A., Wesleyan University; Ph.D., University of Michigan
- CHARLES E. MOSS
Part-time Lecturer of Art
B.F.A., Memphis Academy of Art; M.F.A., Alfred University
- RICHARD A. MOULD
Associate Professor of Physics
B.S., Lehigh University; M.S., Ph.D., Yale University
- THOMAS J. MUENCH
Professor and Chairman, Department of Economics
A.B., Xavier University; Ph.D., Purdue University
- HERBERT R. MUETHER
Professor of Physics and Director of Undergraduate Program in Physics
B.S., Queens College; A.M., Ph.D., Princeton University
- RICHARD C. MULLANEY
Lecturer in Education
B.S., South Dakota State University; M.A., Ed.D., Teachers College, Columbia University
- EDWARD N. MULLER III
Associate Professor of Political Science
B.A., Yale University; M.A., Ph.D., University of Iowa
- OTTO H. MULLER
Assistant Professor of Geology
A.B., M.S., Ph.D., University of Rochester
- THOMAS P. MURACO
Part-time Lecturer in Music
B.M., Eastman School of Music

MICHALE MURPHY

Assistant Librarian, Periodicals
A.B., Barnard College; M.S. in L.S.,
Columbia University

FRANK E. MYERS

*Associate Professor of Political
Science*
B.A., University of California,
Berkeley; Ph.D., Columbia University

KOZI NAKAI

Visiting Associate Professor of Physics
Ph.D., Osaka University

ROBERT NATHANS

*Dean, W. Averell Harriman College
for Urban and Policy Sciences and
Director, Institute for Urban Science
Research*
B.S., University of Delaware; M.S.,
University of Minnesota; Ph.D.,
University of Pennsylvania

RALPH B. A. NAZARETH

*Part-time Assistant Professor of
English*
B.A., St. Aloysius' College, Mangalore;
M.A., Bombay University; Ph.D.,
SUNY at Stony Brook

JOHN M. NEALE

Associate Professor of Psychology
B.A., University of Toronto;
Ph.D., Vanderbilt University

GERALD NELSON

Associate Professor of English
B.A., Whitman College; M.A.,
Ph.D., Columbia University

ISAAC NEMIROFF

Professor of Music
Cincinnati Conservatory of Music;
Pupil of Stephan Wolpe

EGON NEUBERGER

Professor of Economics
B.A., Cornell University; M.A.,
Ph.D., Harvard University

THOMAS NEUMILLER

Associate Professor of Theatre Arts
B.A., Knox College; M.F.A.,
Yale University

PAUL A. NEWLIN

Assistant Professor of English
B.A., Earlham College; M.A.,
Ohio State University; Ph.D.,
University of California at Los Angeles

DOLORES NEWTON

Assistant Professor of Anthropology
B.A., Brooklyn College; M.A.,
Ph.D., Harvard University

JOHANNE NICODEMOU

Part-time Lecturer in French
Diplôme d'études collégiales,
Collège de Rosemont; Montreal;
B.A., State University of New York
at Stony Brook

JOHN MICHAEL NIEDERBUHL

Part-time Lecturer in Psychology
B.A., Hamilton College; Ph.D.,
SUNY at Stony Brook

IWA-TUNG NIEH

*Associate Professor of Physics and
Member, Institute for Theoretical
Physics*
B.S., National Taiwan University;
Ph.D., Harvard University

EDWARD E. O'BRIEN

Professor of Engineering
B.E., University of Queensland,
Australia; M.S.M.E., Purdue University;
Ph.D., Johns Hopkins University

COLETTE M. O'CONNELL

Assistant Librarian
B.A., Rhode Island College; M.L.S.,
SUNY at Albany

JOEL S. O'CONNOR

*Part-time Adjunct Associate Professor
in the Marine Sciences Research
Center*
B.S., Cornell University; M.S., Ph.D.,
University of Rhode Island

HAROLD B. O'CONNORS, JR.

*Assistant Professor in the Marine
Sciences Research Center and
Marine Environmental Studies
Program*
B.S., Southern College; M.S., Ph.D.,
Oregon State University

YOSHIHARU OKAYA

Professor of Chemistry
B.S., Ph.D., Osaka University

AKIRA OKUBO

*Professor in the Marine Sciences
Research Center*
B. Engineering, Marine Science,
Tokyo Institute of Technology; Ph.D.,
The Johns Hopkins University

K. DANIEL O'LEARY

*Professor of Psychology and Director
of Division for Learning Disabilities*

- and Behavior Disorders, Institute for Research in Learning and Instruction*
B.A., Pennsylvania State University;
M.A., Ph.D., University of Illinois
- SUSAN O'LEARY
Part-time Visiting Assistant Professor of Psychology
B.A., M.A., University of Illinois;
Ph.D., State University of New York at Stony Brook
- DANIEL C. O'NEIL
Assistant Professor of German
B.A., Ph.D., Cornell University
- MICHAEL MITCHELL OSARCHUK
Visiting Assistant Professor of Psychology
B.A., Adelphi University; M.A., C. W. Post; Ph.D., Adelphi University
- DONALD A. OSBORNE
Associate Librarian, Acquisitions
A.B., Middlebury College; M.S.L.S., Drexel Institute of Technology
- STANLEY J. OSHER
Professor of Mathematics
B.S., Brooklyn College; M.S., Ph.D., New York University
- ARNOLD M. OSTEBEE
Part-time Lecturer in Physics
B.A., St. Olaf College
- TOBIAS C. OWEN
Professor of Astronomy
B.A., B.S., M.S., University of Chicago; Ph.D., University of Arizona
- LESTER PALDY
Assistant Professor of Physics
B.S., State University of New York at Stony Brook; M.S., Hofstra University
- BARRY A. PALEVITZ
Assistant Professor of Biological Sciences
B.S., Brooklyn College; Ph.D., University of Wisconsin
- ALLISON R. PALMER
Professor of Paleontology & Chairman, Department of Earth and Space Sciences
B.S., Pennsylvania State University; Ph.D., University of Minnesota
- FRANCIS H. PALMER
Professor of Psychology
B.S., M.S., Ph.D., University of Pittsburgh
- JOHN N. PALMER
Instructor in Mathematics
B.S., Massachusetts Institute of Technology; M.S., Ph.D., Stanford
- JAMES J. PAPIKE
Professor of Crystallography
B.S., South Dakota School of Mines and Technology; Ph.D., University of Minnesota
- CANUTE N. PARRIS
Assistant Professor of Africana Studies
B.S., South Dakota State University; M.A., New School for Social Research
- RUTH A. PATTERSON
Assistant Librarian
B.S., Indiana University of Pennsylvania; M.L.S., Kent State University
- PETER PAUL
Professor of Physics
B.A., M.A., Ph.D., University of Freiburg
- MAURO G. PEDRETTI
Research Associate in Engineering
Diploma, Ph.D., Swiss Federal Institute of Technology, Zurich
- MELVIN H. PEKARSKY
Associate Professor of Art
B.A., M.A., Northwestern University
- WILLIAM E. PELHAM, JR.
Part-time Lecturer in Psychology
A.B., Dartmouth College
- ARNO A. PENZIAS
Adjunct Professor of Earth and Space Sciences
B.S., City College of New York; M.A., Ph.D., Columbia University
- JOSEPH PEQUIGNEY
Associate Professor of English
B.A., University of Notre Dame; M.A., University of Minnesota; Ph.D., Harvard University
- CHARLES B. PERROW
Professor of Sociology
B.A., M.A., Ph.D., University of California, Berkeley
- PERTTI PESONEN
Professor of Political Science
M.A., Lic. Pol., Ph.D., University of Helsinki
- FRANK R. PETERS
Professor of Education
B.S., University of Omaha; M.A., Ph.D., University of Chicago

- DEANE M. PETERSON
Associate Professor of Astronomy
B.A., M.S., Northwestern University;
M.S., Yale University; Ph.D.,
Harvard University
- LOUIS S. PETERSON
Associate Professor of Theatre Arts
New York University
- D. SANDY PETREY
Associate Professor of French
B.A., Emory University;
Ph.D., Yale University
- JEAN B. PEYER
Assistant Professor of History
B.A., M.A., Queens College, CUNY;
Ph.D., Graduate Center of the
City University of New York
- ANTHONY PHILLIPS
Professor of Mathematics
S.B., Massachusetts Institute of
Technology; Ph.D., Princeton
University
- JULIET R. PHILLIPS
*Part-time Adjunct Assistant Professor
of Education*
B.A., Harvard University; Ph.D.,
Johns Hopkins University
- EMIL J. PIEL
*Professor, Department of
Electrical Sciences*
Ed.D., Rutgers, The State University,
New Jersey
- JOEL D. PINCUS
Professor of Mathematics
B.A., Cornell University;
Ph.D., New York University
- DOMINIC L. POCCIA
*Assistant Professor of Biological
Sciences*
B.S., Union College; A.M.,
Ph.D., Harvard University
- CRAIG K. POLITE
Assistant Professor of Psychology
B.A., University of Toledo; M.A.,
Ph.D., Michigan State University
- NED POLSKY
Associate Professor of Sociology
B.A., University of Wisconsin
- DAVID M. POMERANZ
Associate Professor of Psychology
B.S., Brooklyn College;
Ph.D., University of Rochester
- T. ALEXANDER POND
*Professor of Physics and Executive
Vice President*
B.A., A.M., Ph.D., Princeton University
- JONATHAN POOL
Assistant Professor of Political Science
B.A., Harvard University; M.A.,
Ph.D., University of Chicago
- RICHARD N. PORTER
Professor of Chemistry
B.S., Texas A & M University;
Ph.D., University of Illinois
- JOHN W. PRATT
Associate Professor of History
B.A., University of Rochester;
M.A., Ph.D., Harvard University
- CAROLYN M. PREECE
Associate Professor of Engineering
B.Sc., Ph.D., D.I.C., Imperial College,
University of London
- CHARLES T. PREWITT
Professor of Crystallography
S.B., S.M., Ph.D., Massachusetts
Institute of Technology
- CARMINE A. PRIOLI
*Part-time Assistant Professor of
English*
A.A., Massachusetts Bay Community
College; B.A., Suffolk University;
M.A., Boston College
- KARL H. PROEHL
Assistant Librarian
B.A., Southwest Missouri State
University; M.A., University of Missouri
- MAVIS I. PUSEY
Assistant Professor of Art
- HOWARD R. RACHLIN
Professor of Psychology
B.M.E., Cooper Union; M.A.,
New School for Social Research;
Ph.D., Harvard University
- PHILLIPPE D. RADLEY
*Assistant Professor of Germanic
and Slavic Languages*
A.B., A.M., Ph.D., Harvard University
- FAUSTO RAMIREZ
Professor of Chemistry
B.S., Ph.D., University of Michigan
- JOHN W. RAMSEY
*Associate Professor of Physical
Education*
B.S., Cortland State Teachers College;
M.S., Hofstra University

- RICHARD A. RAND**
Assistant Professor of English
 B.A., Harvard College; Ph.D.,
 The City University of New York
- H. HELEN RANDOLPH**
Part-time Lecturer in Education
 B.A., Fisk University; M.A.,
 New York University
- RICHARD T. RAPP**
Associate Professor of History
 B.A., Brooklyn College; M.A., Ph.D.,
 University of Pennsylvania
- STEPHEN S. RAPPAPORT**
Associate Professor of Engineering
 B.E.E., Cooper Union, School of
 Engineering; M.S.E.E., University of
 Southern California; Ph.D., New York
 University
- ROBERTO M. RAVELO**
Associate Librarian, Cataloging
 B.A., D.C.L., University of Havana;
 M.L.S., Kansas State Teachers College
- ANTHONY W. RAY**
*Lecturer in Education and Coordinator
 of Elementary Education*
 B.Mus. University of Colorado;
 M.A.L.S., State University of New York
 at Stony Brook
- ROBERT G. RAY**
Lecturer in Philosophy
 B.S., Montana State University
- RICHARD REEDER**
Lecturer in Political Science
 B.A., SUNY at Stony Brook
- STANLEY REGELSON**
Assistant Professor of Anthropology
 B.A., City College of New York;
 Ph.D., Columbia University
- CARL J. RHEINS**
Part-time Lecturer in Judaic Studies
 B.S., University of Wisconsin; M.A.,
 State University of New York
 at Albany
- ROSLYN G. RIBNER**
Lecturer, College of Arts and Sciences
 B.A., M.A., University of
 North Carolina
- ELIZABETH RIGGS**
*Assistant Professor of French and
 recipient of the Chancellor's Award
 for Excellence in Teaching ('74-'75)*
 B.A., Barnard College; M.A.,
 Columbia University; Diplome
 d'aptitude a l'enseignement du
 français moderne, Lausanne,
 Switzerland; Ph.D., Columbia
 University
- MONICA RILEY**
Professor of Biological Sciences
 B.A., Smith College; Ph.D., University
 of California, Berkeley
- DAVID W. RING**
Part-time Lecturer in Economics
 B.S., M.A., Northeastern University
- JOAN RINGELHEIM**
Assistant Professor of Philosophy
 A.B., M.A., Ph.D., Boston University
- ANTHONY RIZZUTO**
Associate Professor of French
 B.A., M.A., Ph.D., Columbia University
- THOMAS ROGERS**
Associate Professor of English
 B.A., University of Delaware; A.M.,
 Ph.D., University of Pennsylvania
- F. JAMES ROHLF**
*Professor of Biological Sciences and
 Chairman, Department of Ecology
 and Evolution*
 B.A., San Diego State College; Ph.D.,
 University of Kansas
- ANTHONY D. ROMEO**
*Part-time Adjunct Associate Professor
 of Youth and Community Studies*
 B.A., St. Francis College; M.A.,
 Brooklyn College; M.S.S., Fordham
 University
- RONALD ROSEMAN**
*Performing Artist in Residence and
 Part-time Lecturer in Music*
 B.A., Queens College
- CHARLES ROSEN**
Professor of Music
 B.A., M.A., Ph.D., Princeton University
- SHARON L. ROSEN**
Assistant Professor of Psychology
 B.A., University of Wisconsin; Ph.D.,
 University of Michigan
- TERRY ROSENBERG**
Assistant Professor of Sociology
 B.A., Antioch College; M.A.,
 Ph.D., University of Chicago
- MIRA ROSENFELD**
Lecturer in Judaic Studies
 B.A., Queens College; M.A.,
 Jewish Theological Seminary

- DONALD B. ROSENFELD**
Assistant Professor of Urban and Policy Sciences
 S.B., S.M., E.E., Massachusetts Institute of Technology; Ph.D., Stanford University
- JOEL T. ROSENTHAL**
Professor of History and Chairman of History and Interdisciplinary Program in Social Sciences
 B.A., M.A., Ph.D., University of Chicago
- ALAN O. ROSS**
Professor of Psychology and Director of Clinical Training
 B.S., City College of New York; M.S., Ph.D., Yale University
- EDNA ROSS**
Lecturer in Education
 B.A., Brooklyn College; M.A., Bank Street College of Education
- EVELYN B. ROTHSTEIN**
Assistant Professor of Education
 B.S.MEd., M.S.MEd., City College of New York; Ed.D., Teachers College
- LAURENCE G. ROTKIN**
Part-time Lecturer
 B.A., Harpur College, SUNY Binghamton; MA/LS SUNY, Stony Brook
- JOHN B. ROTTA**
Part-time Lecturer in Hispanic Languages and Literature
 B.A., La Salle College; M.A., New York University
- SHASANKA M. ROY**
Research Associate in the Institute for Theoretical Physics
 B.S., M.Sc., Delhi University; India; M.A., Ph.D., Princeton University
- ELI RUBENSTEIN**
Professor of Psychiatry and Psychology
 B.S.S., City College of New York; M.A., Ph.D., Catholic University; M.D., Washington School of Psychiatry
- JAMES RULE**
Associate Professor of Sociology
 Ph.D., Harvard University
- FERDINAND A. RUPLIN**
Associate Professor of Germanic and Slavic Languages, Associate for Instructional Resources in Computer Assisted Instruction
 B.A., M.A., Ph.D., University of Minnesota
- JOHN R. RUSSELL**
Associate Professor and Chairman, Department of Germanic and Slavic Languages; and Associate for Instructional Resources in Computer Assisted Instruction
 B.A., A.M., Ph.D., Princeton University
- CHIH-HAN SAH**
Professor of Mathematics
 B.S., M.S., University of Illinois; Ph.D., Princeton University
- YASUO SAKATA**
Lecturer in History
 B.A., M.A., University of California at Los Angeles
- HOWARD L. SANDERS**
Adjunct Professor of Biological Sciences
 B.A., University of British Columbia; M.S., University of Rhode Island; Ph.D., Yale University
- RUTH H. SANDERS**
Adjunct Lecturer of Germanic Languages
 B.A., University of Michigan; M.A., Ph.D., SUNY at Stony Brook
- RAGHUPATHY SARMA**
Assistant Professor of Biological Sciences
 B.Sc., Presidency College; M.Sc., Ph.D., University of Madras
- MICHAEL J. SATTINGER**
Assistant Professor of Economics
 B.S., University of Michigan; M.S., Ph.D., Carnegie-Mellon University
- CARL J. SCANDELLA**
Assistant Professor of Biological Sciences
 B.S., California Institute of Technology; Ph.D., Stanford University
- HOWARD A. SCARROW**
Professor of Political Science
 B.A., Duke University; M.A., Wayne State University; Ph.D., Duke University
- OLIVER A. SCHAEFFER**
Professor of Geochemistry
 B.S., Pennsylvania State University; M.S., University of Michigan; Ph.D., Harvard University
- JOEL R. SCHECHTER**
Lecturer in Theatre Arts
 B.A., Antioch College; M.F.A., D.F.A., Yale School of Drama

- WALTER SCHEPS
Visiting Associate Professor of English
B.A., City College of New York;
Ph.D., University of Oregon
- JUDITH SCHIFFER
Lecturer in Education
B.A., Brooklyn College; M.A.,
State University of New York
at Stony Brook
- ERLING O. SCHILD
Adjunct Professor of Sociology
M.A., University of Copenhagen;
Ph.D., Hebrew University
- MARK S. SCHNEIDER
Assistant Professor of Political Science
B.A., Brooklyn College; Ph.D.,
University of North Carolina
- ROBERT F. SCHNEIDER
Associate Professor of Chemistry
B.A., M.A., Ph.D., Columbia University
- FRANK SCHNUR
*Lecturer in Germanic and Slavic
Languages*
B.A., Adelphi University; M.A.,
New York University of New York
at Stony Brook
- GREGORY SCHOEPFLE
Assistant Professor of Economics
B.A., Oberlin College; M.A.,
Ph.D., Purdue University
- EARL G. SCHREIBER
Assistant Professor of English
B.A., State University of New York
at Albany; M.A., Johns Hopkins
University; Ph.D., University of Illinois
- HEINZ H. SCHREIBER
*Visiting Assistant Professor of
Applied Mathematics and Statistics*
B.E.E., City College; M.S.,
Adelphi University; Ph.D. (EE),
Brooklyn Polytechnic
- KLAUS SCHROTER
*Professor of Germanic and Slavic
Languages*
Ph.D., Hamburg University
- JERRY R. SCHUBEL
*Professor and Director of the Marine
Sciences Research Center*
B.S., Alma College; M.A.T., Harvard
University; Ph.D., Johns Hopkins
University
- ROSEMARY SCHUMANN
Lecturer in Education
B.A., Queens College; B.S.,
Hofstra University
- GEORGE W. SCHUYLER
*Chairman of Ibero-American Studies
and Adjunct Lecturer in History*
B.A., Yale University; M.A.,
Johns Hopkins University
- ROGER W. SCHVANEVELDT
Associate Professor of Psychology
B.A., University of Utah; M.S., Ph.D.,
University of Wisconsin, Madison
- EDITH D. SCHWARTZ
Lecturer in Education
B.S., Oswego State Teachers College;
M.S., Hofstra University
- KATHLEEN M. SCHWARTZ
Assistant Professor of English
B.A., University of Toronto; Ph.D.,
Princeton
- MICHAEL SCHWARTZ
*Associate Professor of Sociology and
recipient of the Chancellor's Award
for Excellence in Teaching ('74-'75)*
B.A., University of California,
Berkeley; Ph.D., Harvard University
- ANTHONY SCIABA
Instructor in Italian
B.A., University of Connecticut;
M.A., Rutgers University
- SALLIE SEARS
Associate Professor of English
B.A., Boston University; M.A.,
Ph.D., Brandeis University
- ELI SEIFMAN
Professor of Education
B.A., M.S., Queens College;
Ph.D., New York University
- LESLIE L. SEIGLE
Professor of Engineering
B.Ch.E., Cooper Union; M.S.,
University of Pennsylvania; D.Sc.,
Massachusetts Institute of Technology
- HANAN C. SELVIN
Professor of Sociology
B.A., Ph.D., Columbia University
- DARIA W. SEMEGEN
Instructor in Music
B.Mus., Eastman School of Music,
University of Rochester; M.Mus.,
Yale University
- BERNARD SEMMEL
Professor of History
B.A., City College of New York;
M.A., Ph.D., Columbia University

- RICHARD B. SETLOW**
Adjunct Professor of Biological Sciences
 A.B., Swarthmore College; Ph.D., Yale University
- ELLIOTT N. SHAW**
Adjunct Professor of Biochemistry
 S.B., Ph.D., Massachusetts Institute of Technology
- PETER SHAW**
Associate Professor of English
 B.A., Bard College; A.M., Ph.D., Columbia University
- DAVID R. SHEEHAN**
Assistant Professor of English
 B.A., University of Florida; M.S., Ph.D., University of Wisconsin
- NIGEL J. SHEVCHIK**
Assistant Professor of Physics
 B.S., Carnegie Mellon University; M.S., Ph.D., Harvard
- KENNETH L. SHORT**
Assistant Professor of Engineering
 B.S.E.E., Howard University
- PATRICIA SILBER**
Part-time Assistant Professor of English
 B.A., Hunter College; M.A., Ph.D., State University of New York at Stony Brook
- HENRY B. SILSBEE**
Professor of Physics
 B.S., M.A., Ph.D., Harvard University
- HUGH J. SILVERMAN**
Assistant Professor of Philosophy
 B.A., M.A., Lehigh University; Ph.D., Stanford University
- GARY A. SIMON**
Associate Professor of Applied Mathematics and Statistics
 B.S., Carnegie-Mellon University; Ph.D., Stanford University
- MICHAEL SIMON**
Professor of Astrophysics
 B.A., Harvard University; Ph.D., Cornell University
- SANFORD R. SIMON**
Associate Professor of Biochemistry
 B.A., Columbia University; Ph.D., Rockefeller University
- JAMES SIMONS**
Professor of Mathematics
 S.B., Massachusetts Institute of Technology; Ph.D., University of California, Berkeley
- LOUIS SIMPSON**
Professor of English and Comparative Literature
 B.S., M.A., Ph.D., Columbia University
- MELVIN V. SIMPSON**
Professor and Chairman of Biochemistry
 B.S., City College of New York; Ph.D., University of California, Berkeley
- JEROME E. SINGER**
Professor of Sociology
 B.A., University of Michigan; Ph.D., University of Minnesota
- MICHAEL F. SINGER**
Instructor in Mathematics
 B.A., New York University; M.A., Ph.D., University of California, Berkeley
- LEIF SJOBERG**
Professor of Scandinavian Studies
 Ph.D., Uppsala University
- LAWRENCE B. SLOBODKIN**
Professor of Ecology and Evolution
 B.S., Bethany College; Ph.D., Yale University
- MICHAEL A. SLOTE**
Associate Professor of Philosophy
 A.B., Ph.D., Harvard University
- DAVID R. SMITH**
Professor of Engineering
 B.Sc., Queen Mary College, University of London; M.S., Ph.D., University of Wisconsin
- DORMAN H. SMITH**
Associate Librarian
 A.B., M.A., University of California, Berkeley; M.L.S., Simmons College
- DOUGLAS SMITH**
Assistant Professor of Biological Sciences
 B.A., Hiram College; Ph.D., State University of New York at Stony Brook
- JAMES SMITH**
Part-time Instructor in Physical Education
 B.S., Adelphi University
- JOHN SMITH**
Associate Professor of Physics and Member, Institute for Theoretical Physics
 B.Sc., M.Sc., Ph.D., University of Edinburgh

- JOHN B. SMITH
*Librarian, Director of Libraries and
Dean of Library Services*
B.A., Texas A & M University;
M.S., Columbia University School
of Library Service
- RICHARD SMOLIAK
*Assistant Professor of Physical
Education*
B.S., Wisconsin State University;
M.Ed., University of Minnesota
- ROBERT E. SMOLKER
*Associate Professor of Biological
Sciences*
B.S., Bates College; M.A., Boston
University; Ph.D., University of
Chicago
- ROBERT B. SNIDER
*Assistant Professor of Physical
Education*
B.A., Ph.D., University of Chicago
- NEAL SNYDERMAN
*Research Associate, Institute for
Theoretical Physics*
A.B., University of Pennsylvania;
M.S., Brown University
- ROBERT R. SOKAL
Professor of Biological Sciences
B.S., St. John's University (Shanghai,
China); Ph.D., University of Chicago
- PHILIP M. SOLOMON
Professor of Astronomy
B.S., M.S., Ph.D., University of
Wisconsin
- AMARJIT SONI
*Research Associate in Physics and
Member, Institute for Theoretical
Physics*
B.S., M.S., Delhi University; M.A.,
Ph.D., Columbia University
- BRANKO SOUCEK
*Visiting Professor of Biological
Sciences*
B.Sc., Ph.D., University of Zagreb
- MARSHALL SPECTOR
Associate Professor of Philosophy
B.S., Illinois Institute of Technology;
M.S., University of Chicago; Ph.D.,
Johns Hopkins University
- STEPHEN SPECTOR
Assistant Professor of English
B.A., Pennsylvania State University;
M.Phil., Ph.D., Yale University
- JOEL H. SPENCER
*Associate Professor of Applied
Mathematics and Statistics*
B.S., Massachusetts Institute of
Technology; Ph.D., Harvard
- CHARLES S. SPRINGER, JR.
Associate Professor of Chemistry
B.S., St. Louis University; M.Sc.,
Ph.D., Ohio State University
- SALLY P. SPRINGER
Assistant Professor of Psychology
B.S., Brooklyn College;
Ph.D., Stanford University
- GENE D. SPROUSE
Associate Professor of Physics
S.B., Massachusetts Institute of
Technology; M.S., Ph.D., Stanford
University
- DONALD F. SQUIRES
Professor of Biological Sciences
B.A., Cornell University; M.A.,
University of Kansas; Ph.D.,
Cornell University
- RAM P. SRIVASTAV
*Professor of Applied Mathematics
and Statistics*
B.Sc., M.Sc., Ph.D., Lucknow
University, India; Ph.D., University
of Glasgow
- CHARLES E. STALEY
Associate Professor of Economics
B.A., University of Kansas; Ph.D.,
Massachusetts Institute of Technology
- JOHN S. STAMM
Professor of Psychology
B.S.E., University of Michigan; M.S.,
Ph.D., University of Southern California
- JUDAH L. STAMPFER
Professor of English
B.S., M.A., University of Chicago;
M.A., Columbia University;
Ph.D., Harvard University
- JUNE STARR
Associate Professor of Anthropology
B.A., Smith College; M.A., Columbia
University; Ph.D., University of
California
- LAWRENCE STARR
Assistant Professor of Music
B.A., Queens College; Ph.D.,
University of California, Berkeley

- LOIS E. STECKLER
Part-time Assistant Professor of Economics
B.A., Cornell University; M.A., Ph.D., Yale
- STEPHEN J. STEIN
Assistant Professor of History
B.A., Brandeis University; M.A., Ph.D., Stanford University
- HERMAN O. STEKLER
Professor of Economics
B.A., Clark University; Ph.D., Massachusetts Institute of Technology
- GEORGE STELL
Professor of Engineering
B.S., Antioch College; Ph.D., New York University
- LILLIAN S. STEPHENS
Assistant Professor of Education
B.A., Queens College; M.S., Hofstra University; Ed.D., New York University
- ROBERT STERNFELD
Professor of Philosophy
B.A., University of Illinois; M.A., Ph.D., University of Chicago
- ROLF STERNGLANZ
Associate Professor of Biological Sciences
B.A., Oberlin College; Ph.D., Harvard University
- SARAH H. STERNGLANZ
Assistant Professor of Psychology
B.A., Radcliffe College; M.S., Boston University; Ph.D., Stanford University
- MARTIN STEVENS
Professor of English
B.A., M.A., Western Reserve University; Ph.D., Michigan State University
- ROBERT F. STEVENSON
Associate Professor of Anthropology
B.A., Ph.D., Columbia University
- FREDERICK C. STEWARD
Adjunct Professor of Biological Sciences
B.Sc., Ph.D., University of Leeds; D.Sc., University of London
- RICHARD W. STEWART
Visiting Associate Professor of Engineering
B.S., University of Florida; Ph.D., Columbia University
- LAWRENCE M. STOLUROW
Professor of Education, Executive Director and Co-Director, Division for Educational Technology, Institute for Research in Learning and Instruction
B.A., University of Minnesota; M.A., Cornell University; Ph.D., University of Pittsburgh
- MORTON D. STRASSBERG
Part-time Lecturer in Education
B.S., Brooklyn College; M.A., University of Missouri; Certificates: Secretary Sciences NYS, Secondary Supervisor NYS, Secondary Principal NYS, School Superintendent NYS
- ARNOLD A. STRASSENBURG
Part-time Professor of Physics
B.S., Illinois Institute of Technology; M.S., Ph.D., California Institute of Technology
- ELVIRA RAPAPORT STRASSER
Professor of Mathematics
B.S., Washburn University; Ph.D., New York University
- DORIS STRATMAN
Lecturer in Puerto Rican Studies
B.S., M.A., Fordham University
- SANDOR H. STRAUS
Assistant Professor of Mathematics
B.A., M.A., University of Pennsylvania; Ph.D., University of California, Berkeley
- CURTIS J. STROBECK
Visiting Assistant Professor of Biological Sciences
B.A., M.A., University of Montana; Ph.D., University of Chicago
- BERURIA STROKE
Adjunct Lecturer in Germanic and Slavic Languages
- GEORGE W. STROKE
Professor of Engineering and Medical Biophysics
B.Sc., University of Montpellier, France; Ing.Dipl., Institute of Optics, University of Paris; Dr.esSc., University of Paris (Sorbonne)
- DANIEL D. STROTTMAN
Visiting Assistant Professor of Physics
B.A., University of Iowa; M.A., Ph.D., State University of New York at Stony Brook
- JOHN A. STROZIER, JR.
Part-time Adjunct Associate Professor of Engineering
B.E., Cornell University; Ph.D., University of Utah

- FREDERICK W. STUDIER
*Part-time Adjunct Professor of
Biological Sciences*
B.S., Yale; Ph.D., Caltech
- JOHN W. STURTEVANT
Lecturer in English
A.B., A.M., State University of
New York at Albany
- BENJAMIN SUCHOFF
*Adjunct Professor in the Center for
Contemporary Arts and Letters*
B.S., Cornell University; M.A.,
Ed.D., New York University
- SEI SUJISHI
Professor of Chemistry
B.S., Wayne State University; M.S.,
Ph.D., Purdue University
- GERALD D. SUTTLES
Professor of Sociology
B.A., Reed College; M.A., Ph.D.,
University of Illinois
- CLIFFORD E. SWARTZ
Professor of Physics
B.A., M.S., Ph.D., University of
Rochester
- DAVID H. SWINTON
*Assistant Professor of Urban &
Policy Sciences*
B.A., New York University; M.A.,
Ph.D., Harvard University
- PETER SZUSZ
Professor of Mathematics
Ph.D., Budapest University; Doctor of
Science, Hungarian Academy of
Science
- JOSEPH TANENHAUS
Professor of Political Science
B.A., M.A., Ph.D., Cornell University
- JUDITH TANUR
Assistant Professor of Sociology
B.S., M.A., Columbia University;
Ph.D., SUNY at Stony Brook
- JAMES TASI
Professor of Engineering
B.C.E., New York University; M.S.,
University of Illinois; Ph.D.,
Columbia University
- ERNEST TAUB
Part-time Lecturer in Education
B.A., M.A., Brooklyn College
- MICHAEL E. TAYLOR
*Visiting Assistant Professor of
Mathematics*
A.B., Princeton University; Ph.D.,
University of California at Berkeley
- THOMAS H. TAYLOR
Part-time Lecturer in Psychology
B.S., University of Massachusetts
- WILLIAM R. TAYLOR
Professor of History
B.A., A.M., Ph.D., Harvard University
- VICTORINO TEJERA
Professor of Philosophy
B.A., Ph.D., Columbia University
- REGINALD P. TEWARSON
*Professor of Applied Mathematics
and Statistics*
B.S., Lucknow University, India;
M.S., Agra University, India;
Ph.D., Boston University
- HARRY B. THACKER, JR.
*Research Associate, Institute for
Theoretical Physics*
B.S., Caltech; M.S., Ph.D., University
of California at Los Angeles
- JOHN C. THEYS
*Assistant Professor of Earth and
Space Sciences*
B.S., North Carolina State University;
Ph.D., Columbia University
- GARY L. THOMAS
*Professor and Chairman, Department
of Electrical Sciences*
B.S., M.A., Ph.D., University of
California, Berkeley
- JOHN A. THOMPSON
Professor of English
B.A., Kenyon College; M.A.,
Ph.D., Columbia University
- LESLIE F. THOMPSON
*Associate Professor of Physical
Education*
B.A., M.A., Columbia University
- JOHN A. THORPE
Associate Professor of Mathematics
S.B., Massachusetts Institute of
Technology; Ph.D., Columbia
University
- INGRID M. TIEGEL
Assistant Professor of Education
B.A., Stanford University; M.S.,
San Jose State College; Ph.D.,
University of Minnesota
- DAVID C. TILLEY
Adjunct Instructor in Education
B.A., Haverford College; M.A.,

- Teacher's College, Columbia University
- MARTIN B. TIMIN**
Part-time Associate Professor and Director, Program in Youth and Community Studies
A.B., Columbia College; M.A., University of Michigan
- LOUISA SHEN TING**
Part-time Lecturer in Art
B.A., National Taiwan University; M.A., University of California, Berkeley; M.I.S., Columbia University
- JOHN S. TOLL**
Professor of Physics and University President
B.S., Yale University; A.M., Ph.D., Princeton University
- OLDRICH TOMAN**
Assistant Librarian, Cataloging
B.A., Charles University, Prague; M.A., New York University; M.L.S., Columbia University
- CRAIG A. TRACY**
Research Associate, Institute for Theoretical Physics
B.S., University of Missouri; M.A., Ph.D., SUNY at Stony Brook
- DAVID F. TRASK**
Professor of History
B.A., Wesleyan University; A.M., Ph.D., Harvard University
- MARTIN B. TRAVIS**
Professor of Political Science
B.A., Amherst College; M.A., Fletcher School of Law and Diplomacy; Ph.D., University of Chicago
- LEO TREITLER**
Professor and Chairman, Department of Music
B.A., M.A., University of Chicago; M.F.A., Princeton University
- JAMES T. TRIPP**
Adjunct Assistant Professor in the Marine Sciences Research Center
B.A., Yale University; L.L.B., Yale Law School; M.A., Yale Graduate School
- JOHN G. TRUXAL**
Professor and Dean of the College of Engineering and Applied Sciences, and Co-Director Division for Educational Technology, Institute for Research in Learning and Instruction
A.B., Dartmouth College; B.S., Massachusetts Institute of Technology; D.Sc., Purdue University
- SHU-I TU**
Assistant Professor of Chemistry
B.S., National Taiwan University; M.Ph., Ph.D., Yale University
- HANG-SHENG TUAN**
Associate Professor of Engineering
B.S., National Taiwan University; M.S.E.E., University of Washington; Ph.D., Harvard University
- ALAN C. TUCKER**
Associate Professor and Undergraduate Program Director of Applied Mathematics and Statistics
B.A., Harvard University; M.S., Ph.D., Sanford University
- BERNARD D. TUNIK**
Associate Professor of Biological Sciences
B.A., University of Wisconsin; M.A., Ph.D., Columbia University
- JOHN R. G. TURNER**
Associate Professor of Biological Sciences
B.Sc., University of Liverpool; D.Phil., University of Oxford
- W. BURGHARDT TURNER**
Assistant Professor of History
B.A., Kentucky State College; M.A., Columbia University
- JOSEPH A. TURSI**
Professor of Italian, Associate Chairman of Department of French and Italian and Supervisor of Student Teaching and Recipient of the Chancellor's Award for Excellence in Teaching ('74-'75)
B.A., Manhattan College; M.A., Fordham University; Ph.D., New York University
- BERNARD TURSKY**
Professor of Political Science, Psychology, and Psychiatry
Diploma, Lowell Institute, Massachusetts Institute of Technology
- JAMES TWEEDY**
Assistant Professor of Psychology
B.A., University of Minneapolis; Ph.D., Stanford University
- DANIEL H. TYCKO**
Professor of Engineering and Computing Center Associate

- B.A., University of California at Los Angeles; Ph.D., Columbia University
- ANDREA TYREE
Associate Professor of Sociology
B.A., Antioch College; M.A., University of Hawaii; Ph.D., University of Chicago
- GREGORY S. UM
Part-time Lecturer in Physics
A.B., University of California, Berkeley
- STUART VALINS
Professor of Psychology
B.A., Hunter College; M.A., Ph.D., Columbia University
- DAVID VANCE
Visiting Associate Professor and Director, Museum Computer Network
B.A., University of Michigan; M.A., New York University Institute of Fine Arts
- PETER VAN NIEUWENHUIZEN
Assistant Professor of Physics and member Institute for Theoretical Physics
Ph.D., Mathematics, Physics, Utrecht University
- EDWARD VAN ROY
Associate Professor of Economics
B.B.A., Clark University; Ph.D., University of Texas
- PRASAD VARANASI
Associate Professor of Engineering
B.Sc., (Hons.), Andhra University; M.S., Indian Institute of Science; M.S., Massachusetts Institute of Technology; Ph.D., University of California, San Diego
- GERHARD M. VASCO
Librarian, Subject Specialist
B.A., M.A., Ph.D., New York University; M.L.S., Rutgers University
- RUPERT D. VAUGHAN
Lecturer in Africana Studies Program
B.A., Brooklyn College; M.A., State University of New York at Stony Brook
- VITTORIA G. VETRUGNO
Instructor in Italian
A.B., Hunter College; M.A., Rutgers University
- CHARLES H. VICINUS
Associate Professor of Theatre Arts
B.A., Antioch College; M.F.A., Yale University Drama School
- MARIAN VISICH, JR.
Professor of Engineering
B.Ae.E., M.Ae.E., Ph.D., Polytechnic Institute of Brooklyn
- LUCY E. VOGEL
Associate Professor of Russian
B.A., Brooklyn College; M.A., Fordham University; Ph.D., New York University
- EVERT VOLKERSZ
Associate Librarian, Special Collections
B.A., M.L.S., University of Washington
- A. HENRY VON MECHOW
Associate Professor of Physical Education
B.S., M.S., Cortland State Teachers College
Associate Librarian, Subject Specialist
- CATHERINE V. VON SCHON
A.B., Hillsdale College; M.A., M.L.S., University of Michigan
- HORST D. WAHL
Visiting Associate Professor of Physics
Ph.D., University of Vienna
- CHARLES WALCOTT
Professor and Chairman, Department of Cellular and Comparative Biology
B.A., Harvard University; Ph.D., Cornell University
- ROSALIND WALCOTT
Assistant Librarian
B.Sc., University of New England; B.A., Australian National University; M.L.S., C. W. Post Center, Long Island University
- ANNIE MAE WALKER
Assistant Professor of Education
B.S., Bethune-Cookman College; M.A., Adelphi University
- MARK A. WALKER
Visiting Assistant Professor of Economics
B.A., University of California at Santa Barbara; M.S., Ph.D., Purdue University
- NORMAN R. WALLIS
Assistant Professor of English
B.A., Boston University; M.A., Ph.D., University of Chicago

- ESTHER J. WALLS
Associate Director of Libraries and Librarian
B.A., State University of Iowa;
M.S.L.S., Columbia University
- JOHN J. WALSH
Adjunct Associate Professor of Biological Sciences
A.B., Harvard College; M.S.,
Ph.D., University of Miami
- STANLEY WANAT
Assistant Professor of Psychology and Institute for Research in Learning and Instruction
B.A., Cornell University; M.A.,
Harvard University; Ph.D., Cornell
University
- FRANKLIN F. Y. WANG
Professor of Engineering
B.A., Pomona College; M.S.,
University of Toledo; Ph.D.,
University of Illinois
- JUINN-MING WANG
Lecturer in Assistant Professor of Physics and Member, Institute for Theoretical Physics
B.S., National Taiwan University;
Ph.D., University of California,
Berkeley
- LIN-SHU WANG
Associate Professor of Engineering
B.S., Cheng-kung University; M.S.,
South Dakota School of Mines and
Technology; Ph.D., University of
California, Berkeley
- IRVING WASSERMAN
Part-time Lecturer in Continuing and Developing Education
B.A., Brooklyn College; M.A.,
New York University
- WILLIAM E. WASSERZIEHER
Part-time Lecturer in English
A.A., East Los Angeles College;
B.A., M.A., California State University,
Long Beach
- EDGAR S. WASSWAS
Assistant Professor of Africana Studies Program
B.A., Athens University, Greece;
B.D., Halki Theological Seminary,
Turkey; M.A., Yale University
- WALTER WATSON
Associate Professor of Philosophy
Ph.B., Ph.D., University of Chicago
- DAVID A. WAYNE
Assistant Professor of Engineering
B.S.E.E., M.S.E.E., University of
Missouri; Ph.D., University of Florida
- E. SUE WEBER
Associate Librarian
B.A., Michigan State University;
M.A., Purdue University; M.L.S.,
Columbia University
- SUSAN WEDOW
Assistant Professor of Sociology
B.A., University of California,
Riverside; M.A., University of
California, Davis
- SANDRA WEEDEN
Assistant Professor in Physical Education
B.S., Cortland State Teachers
College; M.E.D., University of
North Carolina
- DONALD WEIDNER
Assistant Professor of Geophysics
A.B., Harvard University; Ph.D.,
Massachusetts Institute of Technology
- PHIL C. WEIGAND
Associate Professor and Chairman, Department of Anthropology
B.A., Indiana University; Ph.D.,
University of Southern Illinois
- HARRY WEINER
Associate Professor of Urban and Policy Sciences
A.B., Brooklyn College; A.M.,
University of Nebraska; S.M.,
Massachusetts
Institute of Technology
- EUGENE WEINSTEIN
Professor of Sociology
B.A., University of Chicago; M.A.,
Indiana University; Ph.D.,
Northwestern University
- FRED WEINSTEIN
Professor of History
B.A., M.A., Brooklyn College; Ph.D.,
University of California, Berkeley
- SHELDON WEINTRAUB
Adjunct Assistant Professor of Psychology
B.A., University of Delaware;
Ph.D., University of Minnesota
- ARTHUR WEISBERG
Performing Artist in Residence and Part-time Lecturer, Department of Music
Pupil of Simon Kovar

- WILLIAM I. WEISBERGER
*Professor of Physics and Member,
Institute of Theoretical Physics*
B.A., Amherst College; Ph.D.,
Massachusetts Institute of Technology
- DAVID W. WEISER
Associate Professor of Chemistry
B.A., Drury College;
Ph.D., University of Chicago
- HERBERT WEISINGER
*Professor of English and Dean of the
Graduate School*
B.A., Brooklyn College; M.A.,
Ph.D., University of Michigan
- MILDRED WEISINGER
*Adjunct Director for Letters at the
Center for Contemporary Arts and
Letters*
A.B., A.M., University of Michigan
- SASHA WEITMAN
Associate Professor of Sociology
B.A., Brandeis University; M.A.,
Ph.D., Washington University
- DONN C. WELTON
Assistant Professor of Philosophy
B.S., Philadelphia College of Bible;
M.A., Wheaton College; Ph.D.,
Southern Illinois University
- RUBEN E. WELTSCH
Associate Professor of History
B.A., Amherst College; B.S.,
Columbia University; M.A.,
Ph.D., University of Colorado
- HEDY WEST
*Adjunct Instructor of Comparative
Literature*
B.A., Western Carolina University;
Certificate, Goethe Institut für
Ausländer
- PETER K. WEYL
*Professor of Oceanography and
Senior Scientist, Marine Sciences
Research Center*
M.S., Ph.D., University of Chicago
- MARGARET C. WHEELER
Associate Professor of Anthropology
B.P.H.E., B.A., M.A., University of
Toronto; Ph.D., Yale University
- ROBERT W. WHITE
Part-time Associate Professor of Art
Rhode Island School of Design
- GROVER J. WHITEHURST
Associate Professor of Psychology
B.A., East Carolina University; M.A.,
Ph.D., University of Illinois
- CHARLES S. WHITMORE
Instructor in Political Science
B.A., Haverford College
- MARK S. WHITNEY
Professor of French
A.B., Rutgers University; A.M.,
Ph.D., University of Pennsylvania
- JERRY L. WHITTEN
Professor of Chemistry
B.S., Ph.D., Georgia Institute of
Technology
- C. ROBERT WICHERS
Assistant Professor of Economics
M.A., Ph.D., University of Amsterdam
- LEE WILCOX
Professor of Physics
M.S., Ph.B., University of Chicago;
Ph.D., Stanford University
- RUDOLF WILDENMANN
Professor of Political Science
Ph.D., Heidelberg University
- ALLAN K. WILDMAN
Associate Professor of History
B.A., University of Michigan; B.D.,
Ph.D., University of Chicago
- JOHN H. WILE
Assistant Professor of Economics
B.A., San Fernando State College;
Ph.D., Brown University
- DAVID P. WILENS
*Part-time Lecturer in Applied
Mathematics and Statistics*
B.S., State University of New York at
Stony Brook; M.S., Northeastern
University
- DAVID J. WILKINSON
*Research Associate, Institute for
Theoretical Physics*
B.A., Trinity College, Cambridge;
Ph.D., University of Pennsylvania
- JERRY D. WILLARD
Part-time Lecturer in Music
- DORIS C. WILLIAMS
*Assistant Librarian, Engineering
Library*
A.B., University of California, Berkeley;
M.S.L.S., Columbia University
- GEORGE C. WILLIAMS
Professor of Biological Sciences
B.A., University of California,
Berkeley; M.A., Ph.D., University of
California at Los Angeles

- JAY C. WILLIAMS
Professor and Chairman, Department of Political Science
B.A., A.M., Ph.D., University of Chicago
- JOHN A. WILLIAMS
Associate Professor of History
B.A., University of Wisconsin; M.A., University of California, Berkeley; Ph.D., University of Wisconsin
- ALICE S. WILSON
Associate Professor of English
B.A., Ladycliff College; M.A., Ph.D., Cornell University
- ROBERT E. WILSON
Assistant Professor in the Marine Sciences Research Center and Marine Environmental Studies Program
B.A., M.A., Ph.D., Johns Hopkins University
- PETER WINKLER
Assistant Professor of Music
A.B., University of California; M.A., Princeton University
- ARNOLD WISHNIA
Associate Professor of Chemistry
B.A., Cornell University; Ph.D., New York University
- R. PETER WOLF
Instructor in Music
A.B., Harvard College; M.Phil., Yale University
- SUSAN B. WOOD
Lecturer in Philosophy
B.A., Northeastern University
- MYRNA H. WOODERS
Assistant Professor of Economics
B.A., University of Alberta
- JOHANN PETER WURM
Part-time Visiting Associate Professor
M.A., Ph.D., University of Heidelberg
- CHARLES F. WURSTER, JR.
Associate Professor of Biological Sciences and Member, Marine Sciences Research Center
B.S., Haverford College; M.S., University of Delaware; Ph.D., Stanford University
- EVERETT J. WYERS
Professor of Psychology
B.A., Ph.D., University of California, Berkeley
- CHEN NING YANG
Einstein Professor of Physics and Director, Institute for Theoretical Physics
B.S., Southwest Associate University, China; Ph.D., University of Chicago; D.Sc., Princeton University
- CHING H. YANG
Professor of Engineering
B.S., National Central University of China; M.S., Ph.D., Lehigh University
- STEPHEN YAZULLA
Assistant Professor of Biological Sciences
B.S., University of Scranton; M.A., Ph.D., University of Delaware
- DENNIS RALPH YOUNG
Associate Professor of Urban and Policy Sciences
B.E., City College of New York; M.S., Ph.D., Stanford University
- WILLIAM JEN CHUN YUAN
Assistant Professor of Applied Mathematics and Statistics
B.A., Taiwan Cheng Kung University; M.A., Wayne State University; Ph.D., University of California, Berkeley
- JAI LIONG YUN
Associate Librarian, Documents
B.A., University of Toledo; M.I.A., M.L.S., Columbia University
- YECHAZEL ZALCSTEIN
Associate Professor of Computer Sciences
A.B., M.A., Ph.D., University of California, Berkeley
- EUGENE ZAUSTINSKY
Associate Professor of Mathematics
B.A., University of California, Berkeley; Ph.D., University of Southern California
- IRIS M. ZAVALA
Professor of Spanish
B.A., University of Puerto Rico; M.A., Ph.D., Salamanca University, Spain
- GERALD J. ZEITZ
Lecturer in Sociology
B.A., Xavier University; M.A., Fordham University; M.A., University of Wisconsin
- EDDY M. ZEMACH
Associate Professor of Philosophy
B.A., M.A., Hebrew University, Jerusalem; Ph.D., Yale University

ARMEN H. ZEMANIAN

*Professor of Applied Mathematics
and Statistics*

B.E.E., City College of New York;
M.E.E., Eng.Sc.D., New York
University

ROSE ZIMBARDO

Associate Professor of English

B.A., Brooklyn College; M.A.,
Ph.D., Yale University

ELEANORE M. ZIMMERMANN

*Professor of French and Chairman,
Department of French and Italian*

B.A., Swarthmore College; M.A.,
Ph.D., Yale University

GEORGE K. ZOLLSCHAN

*Adjunct Associate Professor of
Sociology*

B.Sc., University of London, London
School of Economics

DIETER K. ZSCHOCK

Associate Professor of Economics

B.A., Wesleyan University
Ph.D., Tufts University

PAUL ZUKOFSKY

Associate Professor of Music

B.M., M.S., Juilliard School of Music

MICHAEL ZWEIG

Associate Professor of Economics

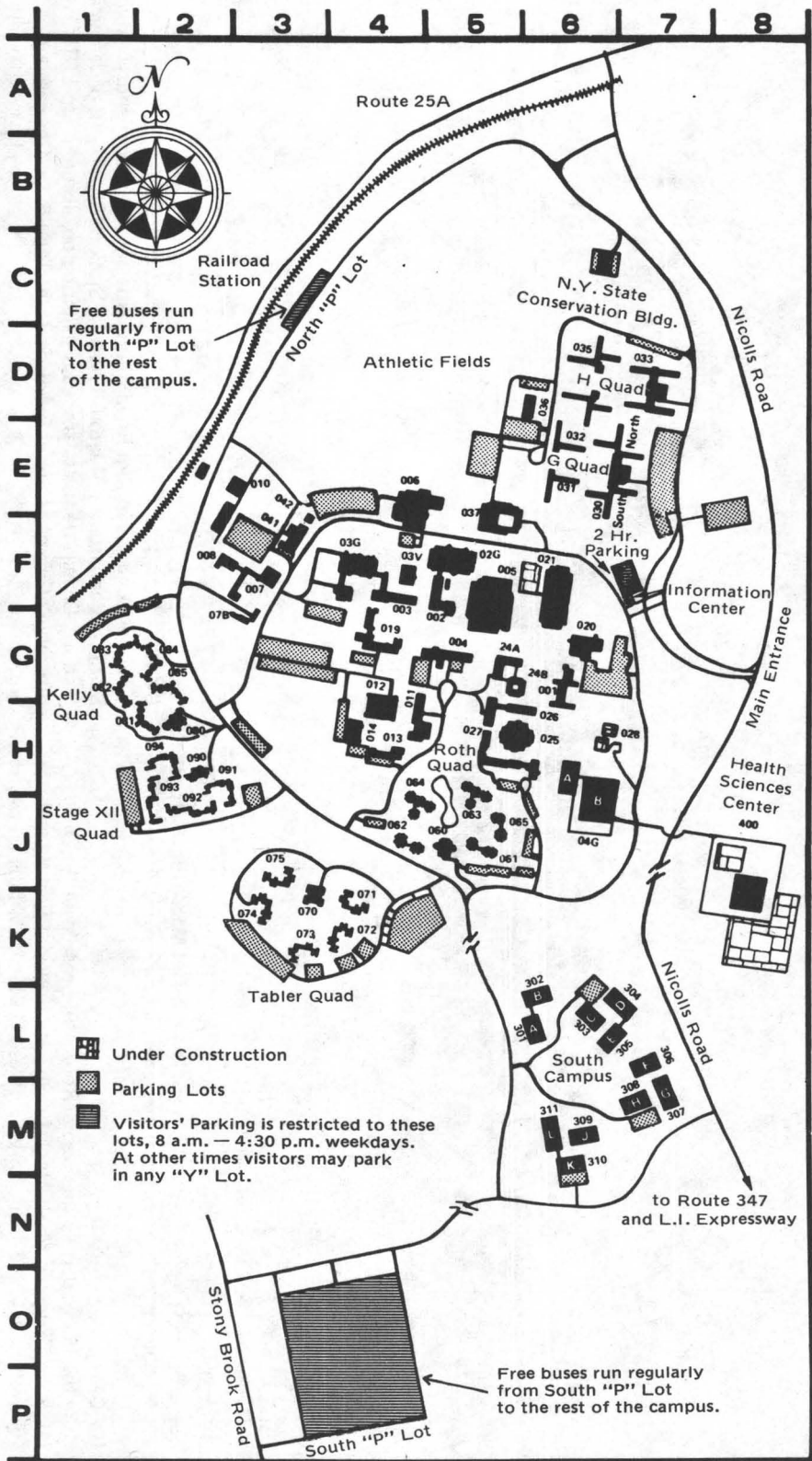
B.A., M.A., Ph.D., University of
Michigan

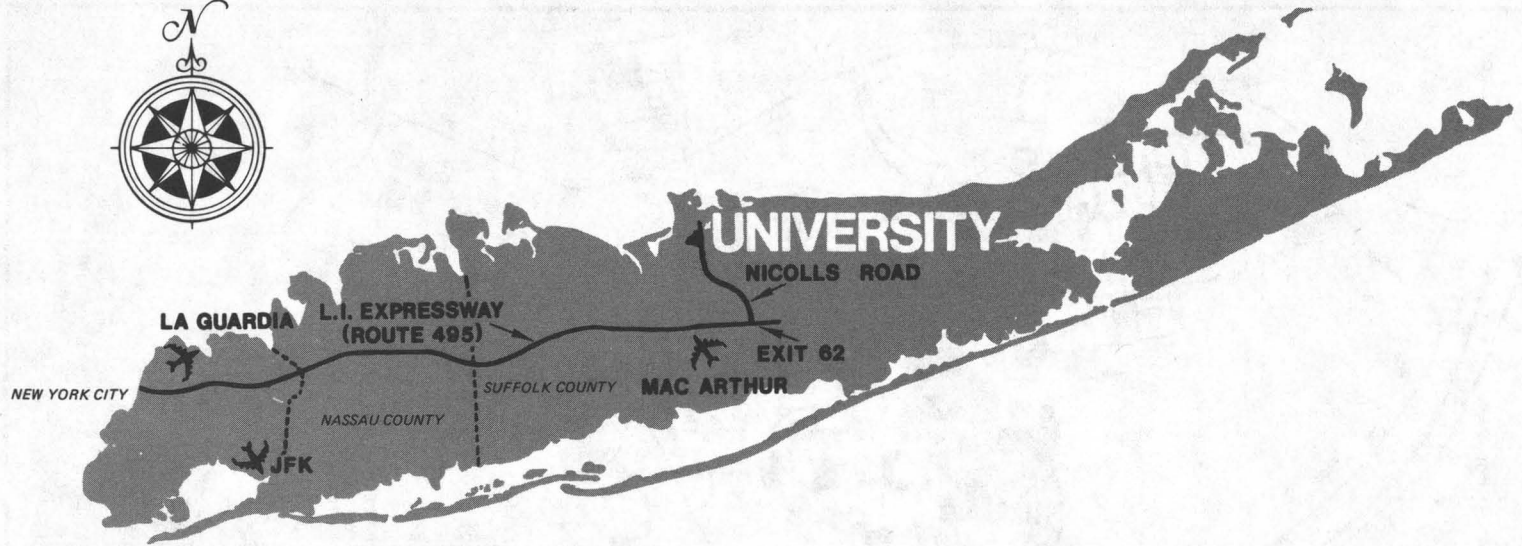
HARLOD ZYSKIND

Professor of Philosophy

M.A., Ph.D., University of Chicago

Official Bldg. No.	Building Index	Map Location
020	ADMINISTRATION BUILDING	G6
032	AMMANN COLLEGE (G QUAD)	E6
082	BARUCH COLLEGE (KELLY QUAD)	G1
033	BENEDICT COLLEGE (H QUAD)	D7
04G	BIOLOGICAL SCIENCES GRADUATE BLDG.	J6
004	BIOLOGY BUILDING	G5
04G	BIOLOGY LIBRARY	H6
062	CARDOZO COLLEGE (ROTH QUAD)	J4
002	CHEMISTRY BUILDING	F5
02G	CHEMISTRY GRADUATE BUILDING	F5
041	COMMISSARY	F3
031	COMMUTER COLLEGE (GRAY COL.)	E6
014	COMPUTING CENTER	H4
081	DEWEY COLLEGE (KELLY QUAD)	H1
072	DOUGLASS COLLEGE (TABLER QUAD)	K4
073	DREISER COLLEGE (TABLER QUAD)	K3
019	EARTH AND SPACE SCIENCES BUILDING	G4
083	EISENHOWER COLLEGE (KELLY QUAD)	G1
010	ELECTRIC SUB-STATION	E3
011	ENGINEERING BUILDING	H4
013	ENGINEERING HEAVY LABORATORY	H4
012	ENGINEERING LIGHT LABORATORY	G4
	N.Y.S. ENVIRONMENTAL CONSERVATION BLDG.	C6
042	FACILITIES AND PLANT ENGRG. BLDG.	E3
021	FINE ARTS (STAGE I, STAGE II)	G6
030	G-CAFETERIA	E6
07B	GARAGE	G2
	GATEHOUSE	F7
065	GERSHWIN COLLEGE (ROTH QUAD)	J5
031	GRAY COLLEGE (G QUAD)	E6
093	GREELEY COLLEGE (STAGE XII QUAD)	J2
006	GYMNASIUM	E4
033	H CAFETERIA	D7
085	HAMILTON COLLEGE (KELLY QUAD)	G2
071	HAND COLLEGE (TABLER QUAD)	K4
400	HEALTH SCIENCES CENTER	J8
008	HEATING PLANT	F2
063	HENRY COLLEGE (ROTH QUAD)	J5
001	HUMANITIES BUILDING	G6
036	INFIRMARY	D5
026	INSTRUCTIONAL RESOURCES CENTER	H6
030	(SOUTH) IRVING COLLEGE (G QUAD)	E6
034	JAMES COLLEGE (H QUAD)	D6
092	KELLER COLLEGE (STAGE XII QUAD)	J2
080	KELLY CAFETERIA	H2
027	LABORATORY OFFICE BUILDING	H5
035	LANGMUIR COLLEGE (H QUAD)	D6
025	LECTURE HALL CENTER	H6
005	LIBRARY, FRANK MELVILLE JR. MEMORIAL	F5
03G	MATH/PHYSICS GRADUATE BUILDING	F4
064	MOUNT COLLEGE (ROTH QUAD)	H4
030	(NORTH) O'NEILL COLLEGE (G QUAD)	E6
003	PHYSICS BUILDING	F4
03G	PHYSICS/MATH GRADUATE BUILDING	F4
060	ROTH CAFETERIA	J5
074	SANGER COLLEGE (TABLER QUAD)	K3
084	SCHICK COLLEGE (KELLY QUAD)	G2
007	SERVICE BUILDING	F3
028	SOCIAL AND BEHAVIORAL SCIENCES	H6
24A	SOCIAL SCIENCES LABORATORY (A)	G5
24B	SOCIAL SCIENCES OFFICE (B)	G6
301	SOUTH CAMPUS A	L6
302	SOUTH CAMPUS B	L6
303	SOUTH CAMPUS C	L6
304	SOUTH CAMPUS D	L7
305	SOUTH CAMPUS E	L6
306	SOUTH CAMPUS F	L7
307	SOUTH CAMPUS G	M7
308	SOUTH CAMPUS H	M7
309	SOUTH CAMPUS J	M6
310	SOUTH CAMPUS K	M6
311	SOUTH CAMPUS L	M6
090	STAGE XII CAFETERIA	H2
091	STIMSON COLLEGE (STAGE XII QUAD)	H2
037	STONY BROOK UNION	E5
070	TABLER CAFETERIA	K3
302	THEATRE (SOUTH CAMPUS B)	M6
075	TOSCANINI COLLEGE (TABLER QUAD)	J3
03V	VAN DE GRAAFF ACCELERATOR	F4
094	WAGNER COLLEGE (STAGE XII QUAD)	H2
007	WAREHOUSE	G2
061	WHITMAN COLLEGE (ROTH QUAD)	J5





BY AIR

Stony Brook is located ten miles from Long Island-MacArthur Airport and 50 miles from Kennedy International and LaGuardia Airports.

BY CAR

Take the Long Island Expressway (Route 495) east from the Queens-Midtown Tunnel in Manhattan. Leave Expressway at Exit 62 and follow Nicolls Road north for nine miles. University will be on the left.

BY RAILROAD

Take the Long Island Rail Road's Port Jefferson line from Pennsylvania Station (Manhattan) or Flatbush Avenue Station (Brooklyn), or Jamaica Station. Change trains at Jamaica or Huntington, according to LIRR timetable. Get off at Stony Brook Station. Inquire for free campus bus.

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