1973-74 undergraduate bulletin

state university of new york at stony brook

STATE UNIVERSITY OF NEW YORK AT

StonyBrook

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This book is printed on recycled paper.
Photographs in this edition of the Undergraduate Bulletin *have been taken by undergraduate students, capturing the campus as they have seen it.*
Front and inside front cover photos by Bill Schmidt
Back cover photo by Peter Levitt
Inside back cover photo by Michael Wintraub

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Address and Phone

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State University of New York at Stony Brook
Stony Brook, New York 11790

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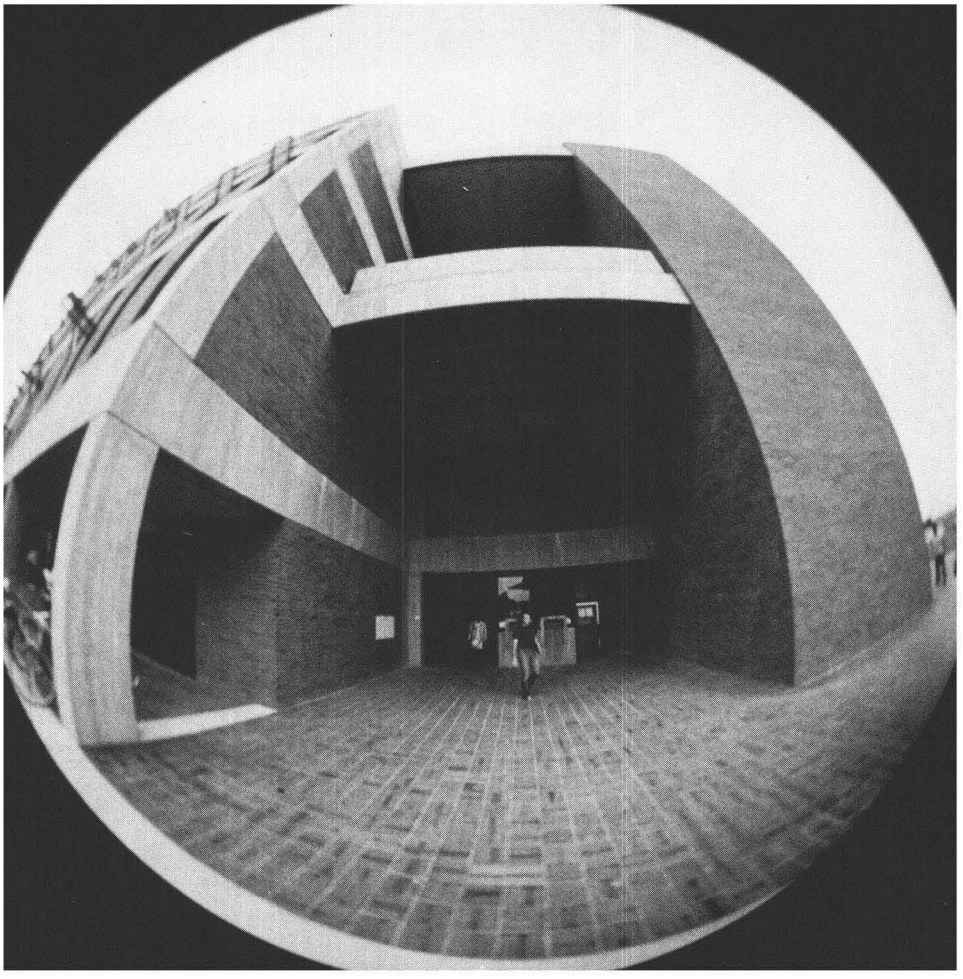
(516) 246-5000.

Contents

Photo by Bill Schmi



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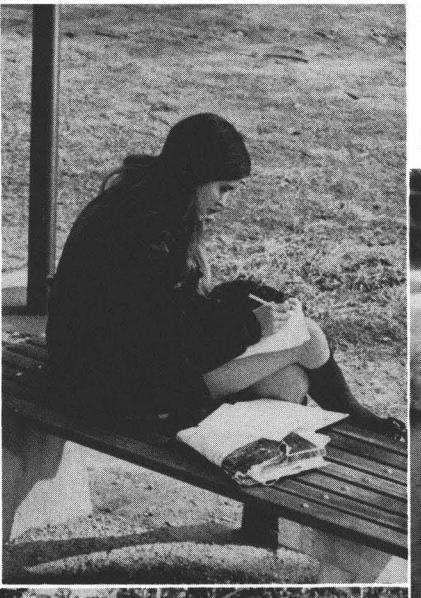
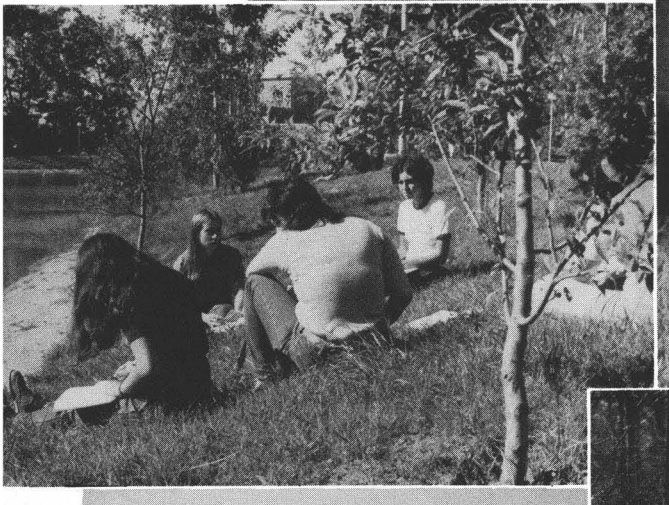


Bruce Stewart

Peter Levitt



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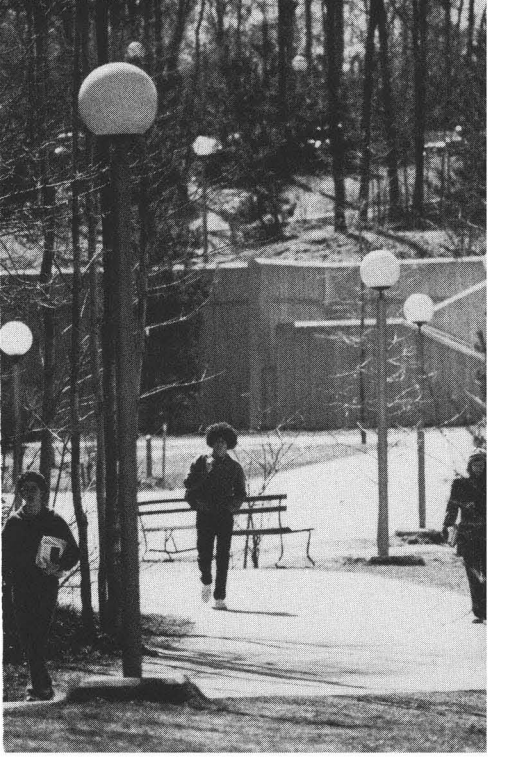
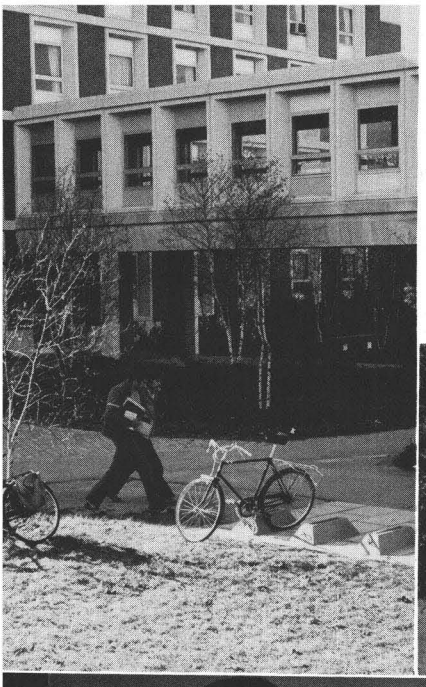


Michael Wintraub



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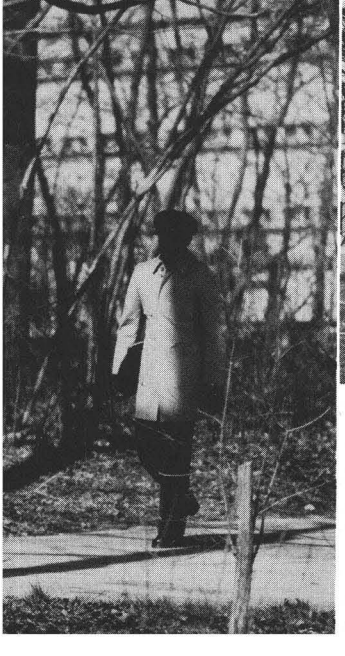
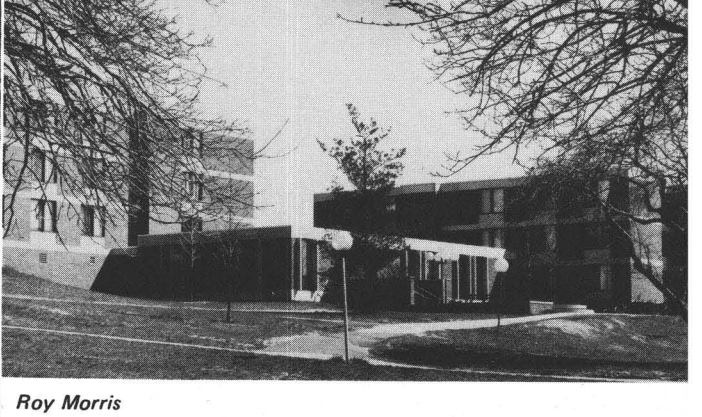




Roy Morris

Michael Wintraub

ACADEMIC CALENDAR
1973-74

Fall Semester 1973

August 26, Sunday	Foreign Students Must Arrive
August 26-September 3 Sunday-Monday	Foreign Student Orientation
August 27, Monday	All Residence Halls Open
August 29, Wednesday	Graduate Student Registration
August 29-August 31 Wednesday-Friday	Undergraduate Student Registration
August 29-September 1 Wednesday-Saturday	Undergraduate Student Orientation
September 3, Monday	Labor Day Recess
September 4, Tuesday	Classes Begin—Late Registration Period Begins
September 17, Monday	End of Late Registration Period—All Students (Including Graduate and CED Students) Last Day to Add a Course—Undergraduates
September 27-September 28 Thursday-Friday	Rosh Hashanah Recess (No Classes from 4:00 p.m. Wednesday, September 26 to 8:00 a.m. Saturday, September 29)
October 1, Monday	Last Day for Graduate Students to Add or Drop a Course Last Day for Undergraduates to Change Courses to or from Pass/No Credit Last Day to File for December Graduation for All Students Who Have Not Applied Previously for this Graduation Date Last Day for Graduate Students to File Degree Cards in the Graduate School Office for December Graduation
October 6, Saturday	Yom Kippur Recess (No Classes from 4:00 p.m. Friday, October 5 to 5:00 p.m. Saturday, October 6)
October 13, Saturday	Campus-Community SUNY 25th Anniversary Open House

November 1, Thursday	Last Day for Removal of Incomplete and NR (No Record) grades from Spring Semester and Summer Session for All Students
November 6-November 9 Tuesday-Friday	Advance Registration for Spring Semester for Graduate and Undergraduate Students (except CED Students)
November 21, Wednesday	Thanksgiving Recess Begins at Close of Classes
November 26, Monday	Classes Resume
December 14, Friday	Last Day of Classes—Last Day to Withdraw from the University
December 17, Monday	Final Examinations Begin
December 21, Friday	Final Examinations End—Fall Semester Ends
	Last Day for Graduate Students to Submit Theses and Dissertations for December Graduation
December 23, Sunday	Residence Halls Close
	Final Grades Due in Registrar's Office 72 Hours After Scheduled Examinations or Last Class Meeting

Spring Semester 1974

January 7, Monday	All Residence Halls Open
January 8, Tuesday	Foreign Students Must Arrive
January 10-January 11 Thursday-Friday	Final Registration for Graduate and Undergraduate Students
January 10-January 13 Thursday-Sunday	Undergraduate Student Orientation
January 14, Monday	Classes Begin—Late Registration Period Begins
January 25, Friday	End of Late Registration Period—All Students (Including Graduate and CED Students)
	Last Day to Add a Course—Undergraduate
January 31, Thursday	Last Day to File for May Graduation for All Students Who Have not Applied Previously for this Graduation Date
February 8, Friday	Last Day for Graduate Students to Add or Drop a Course
	Last Day for Undergraduates to Change Courses to or from Pass/No Credit
February 15, Friday	Last Day for Graduate Students to File Degree Cards in the Graduate School Office for May Graduation

March 15, Friday	Last Day for Removal of Incomplete and NR (No Record) grades from Fall Semester for All Students
April 6, Saturday	Spring Recess Begins at Close of Classes
April 15, Monday	Classes Resume
April 22, Monday	Last Day for Graduate Students to Submit Theses and Dissertations for May Graduation
April 22-April 24 Monday-Wednesday	Advance Registration for Fall Semester for Graduate and Undergraduate Students (except CED Students)
May 10, Friday	Last Day of Classes—Last Day to Withdraw from the University
May 13, Monday	Final Examinations Begin
May 17, Friday	Final Examinations End—Spring Semester Ends
May 19, Sunday	Commencement Final Grades Due in Registrar's Office 72 Hours After Scheduled Examination or Last Class Meeting

Summer Session I 1974

May 17, Friday	Final Registration
May 20, Monday	Classes Begin—Late Registration Period Begins
May 22, Wednesday	End of Late Registration Period Last Day to Add a Course
May 27, Monday	Holiday—No Classes
June 14, Friday	Last Day to Drop a Course Without Withdrawing from the University
June 28, Friday	Summer Session I Ends Last Day to File for August Graduation for Students Who Have Not Applied Previously for this Graduation Date Last Day for Graduate Students to File Degree Cards in the Graduate School Office for August Graduation Final Grades Due in the Registrar's Office 72 Hours After Last Class Meeting

Summer Session II 1974

July 5, Friday	Final Registration
July 8, Monday	Classes Begin—Late Registration Period Begins
July 10, Wednesday	Late Registration Period Ends Last Day to Add a Course
August 2, Friday	Last Day to Drop a Course Without Withdrawing from the University

August 16, Friday	Summer Session II Ends Final Grades Due in the Registrar's Office 72 Hours After Last Class Meeting
August 23, Friday	Last Day for Graduate Students to Submit Theses and Dissertations for August Graduation

Fall Semester 1974 (Tentative)

August 26, Monday	All Residence Halls Open
August 27-August 28 Tuesday-Wednesday	Graduate Student Registration
August 28-August 30 Wednesday-Friday	Undergraduate Student Registration
September 2, Monday	Labor Day Recess
September 3, Tuesday	Classes Begin
September 17-September 18 Tuesday-Wednesday	Rosh Hashanah Recess
September 26, Thursday	Yom Kippur Recess
November 27, Wednesday	Thanksgiving Recess Begins
December 2, Monday	Classes Resume
December 21, Saturday	Semester Ends

Spring Semester 1975 (Tentative)

January 6, Monday	All Residence Halls Open
January 9-January 10 Thursday-Friday	Graduate and Undergraduate Student Registration
January 13, Monday	Classes Begin
March 22, Saturday	Spring Recess Begins
March 31, Monday	Classes Resume
May 16, Friday	Semester Ends
May 18, Sunday	Commencement

Summer Session I 1975 (Tentative)

May 16, Friday	Registration
May 19, Monday	Classes Begin
June 27, Friday	Summer Session I Ends

Summer Session II 1975 (Tentative)

July 3, Thursday	Registration
July 7, Monday	Classes Begin
August 15, Friday	Summer Session II Ends

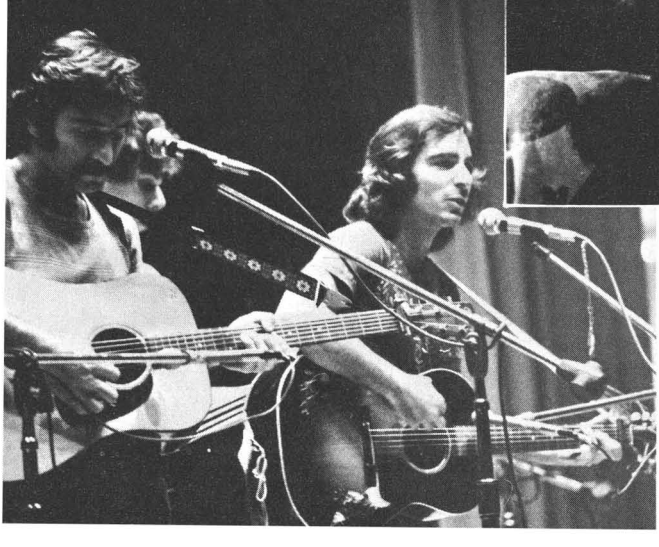
Students enrolled in undergraduate and graduate programs in Health Sciences Center follow a different academic calendar geared to the demands of professional education. The calendar can be found in the *1973-74 Health Sciences Center Bulletin.*

* Last day for undergraduate students to drop courses without withdrawing from the University is presently under review. Contact Office of Records for final date.

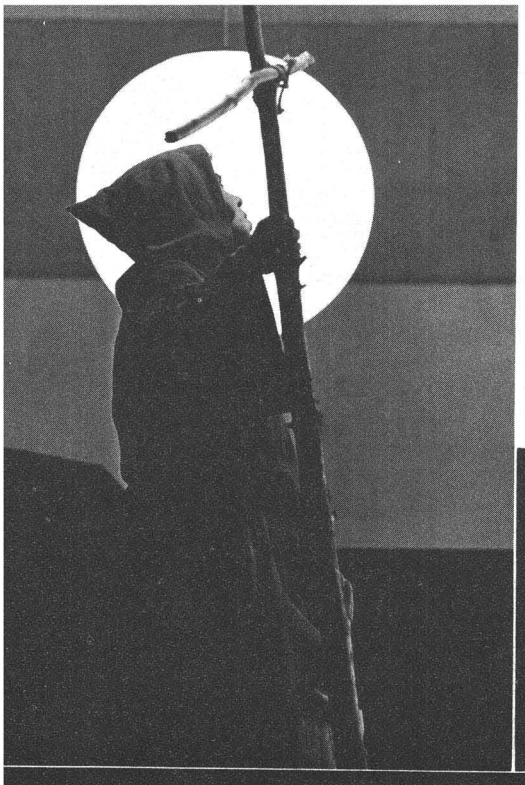
Bonnie of Bonnie & Delaney
by Jook Leung

Doc Watson
by Peter Levitt

Jonathan Edwards
by Peter Levitt

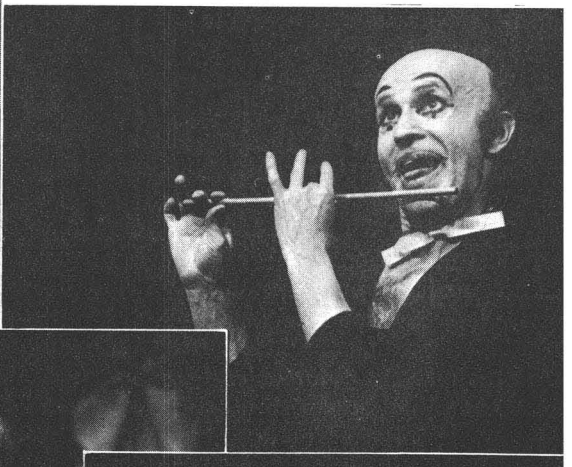


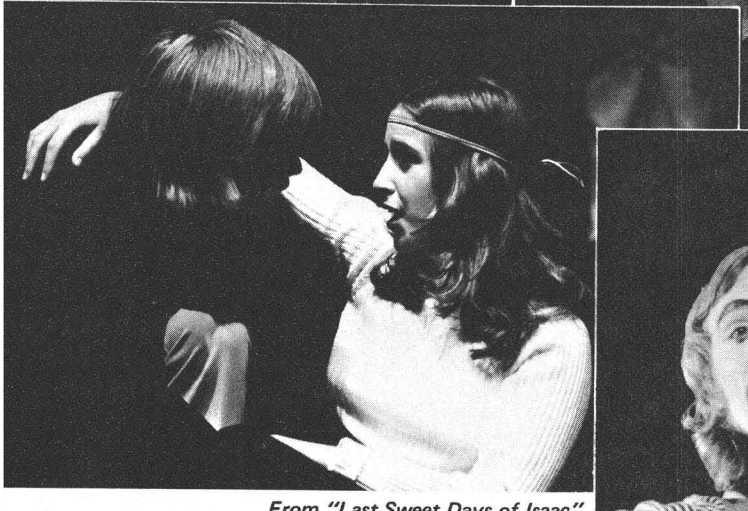
Happy & Artie
by Peter Levitt



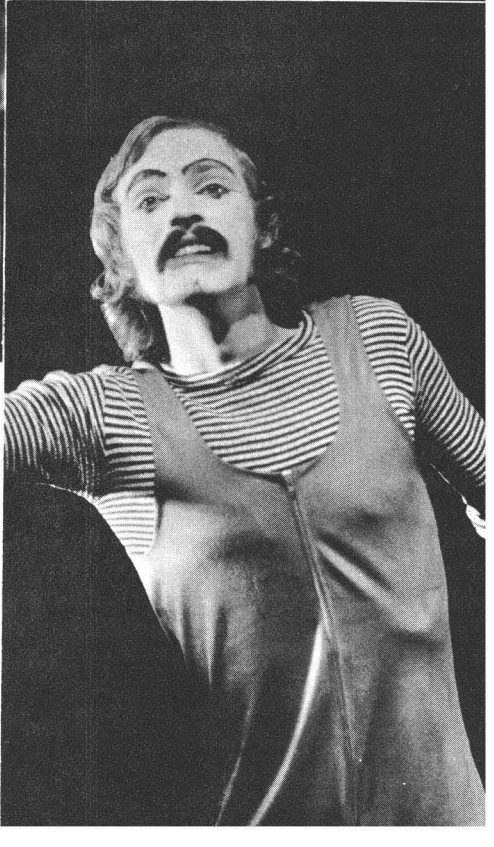
From "As You Like It"

Visiting pantomimist Qwi Kanat





From "Last Sweet Days of Isaac"



All theatre photos by Al Schein

University pantomimist Ralph Vcelka
by Steve Meyer

INTRODUCTION TO STONY BROOK

The youngest comprehensive university center within the 70-campus State University of New York system, Stony Brook was founded in 1957 at Oyster Bay, Long Island, as a State University College for secondary school teachers of science and mathematics. In 1960 it was designated a university center, and two years later, to realize its greater goals, it was moved to a tract of land in Stony Brook which was given to the State by Stony Brook conservationist and philanthropist Ward Melville.

Today, Stony Brook's outstanding faculty offers potential students a diverse choice of majors in the College of Arts and Sciences, the College of Engineering, the Graduate School, the Center for Continuing Education and the Health Sciences Center. It is a University with a commitment to public service and academic excellence, made all the more urgent by its location in the nation's fastest growing population area.

The Campus

Stony Brook's rapidly developing campus is situated in a residential area of Long Island's North Shore which is noted for its predominant colonial appearance, its scenic wooded landscapes, and its picturesque beaches and harbors. New York City, approximately 50 miles west, can be reached by train or car, a ferry to Connecticut is six miles away, and all of Long Island's cultural and recreational attractions are within an hour's drive.

At present, there are 73 campus buildings, with others still under construction or in the design or planning stages. The academic buildings are modern and functional in design, and generally equipped with the most advanced technical and audio-visual equipment.

The University's Main Campus and South Campus, where the Health Sciences Center temporarily is located, are linked by a shuttle bus service.

The campus has a densely developed core of buildings radiating out from the Library's central plaza. Around the Library are the Administration and Humanities Buildings to the east, the Social Sciences and Biology Buildings to the south, and the Earth and Space Sciences, Physics-Math, and Chemistry Buildings to the west. Northwest of the

Library is a new Graduate Chemistry Building, and to the southwest, a new Fine Arts Building is under construction. On the outer rim of the core area are the Gymnasium, the Stony Brook Union, the Lecture Center and the Engineering Quadrangle.

Beyond the central core campus are five residential quadrangles that provide campus dormitory accommodations, dining facilities, and a variety of lounges and social activities.

South of the main campus is a 14-acre natural preserve dedicated to the late Professor Ashley Schiff, and beyond those woods is the South Campus where there are 11 single-story buildings. The walls and furnishings of these buildings can be rearranged for any configuration of lab, classroom and office space. They are permanent buildings designed for temporary tenants. Much of their space is now used by the Health Sciences Center, while its permanent facilities are under construction on the east side of the campus. When its facilities are completed, the Health Sciences Center will be a campus within a campus, housing six schools and a hospital and able to serve a daily population of 12,000. Its buildings, including a 17-story first stage tower now under construction and already a landmark as Long Island's tallest building, will have nearly two million square feet of area, 3000 separate room spaces, and will utilize a professional closed-circuit color television system. A Graduate Biology Building, Graduate Physics and Mathematics Buildings, and the Chemistry Building are all slated to open their doors during the 1973-74 academic year. Ground was recently broken at center campus for a Fine Arts Building which will eventually house the University's Departments of Music, Art and Theatre Arts.

The Students

Stony Brook has an on-campus enrollment of about 13,000 students: approximately 8000 undergraduates and 5000 graduate students. Of the graduate student population, about 2400 are enrolled in the University's evening Center for Continuing Education program, chiefly for working adults, offering courses leading to the Master of Arts in Liberal Studies.

About 93% of Stony Brook's students come from New York State, the vast majority of them, 83%, from the New York City metropolitan area. Of this 83%, 42% come from the University's home, Suffolk County, 21% from adjacent Nassau County on Long Island and 20% from New York City.

The Faculty

To its faculty of about 1000, Stony Brook has increasingly attracted scholars of eminence in many fields. The Institute for Theoretical Physics is directed by a winner of the Nobel Prize for Physics, Dr. C. N. Yang, who serves also as Albert Einstein Professor of Physics—one of ten such endowed positions throughout the State—and as Distinguished

Professor of Physics. The rank of distinguished professor, an honor conferred by the State University Trustees in Albany, is held also by geneticist Bentley Glass in biology, author-critic Alfred Kazin in English, eclectic social scholar Lewis Coser in sociology, and the renowned systematic philosopher Justus Buchler.

Special Centers and Institutes

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 *Center for Curriculum Development* generates new kinds of courses for elementary and secondary education; the *Center for Contemporary Arts and Letters* develops campus art holdings and sponsors visits by practitioners and critics of the arts; the *Economic Research Bureau* brings together the university and public and private agencies in regional research efforts of mutual interest; the *Institute for Colonial Studies* keeps microfilmed archives of original documents from Western Hemisphere colonies, including a rich section of materials on Colonial Long Island; the *Institute for Theoretical Physics* has a faculty of a dozen scholars researching all areas of theoretical physics; *Instructional Resources Center,* in cooperation with faculty members and departments, helps develop more effective teaching methods through the use of computers and other technical aids; and the *Institute for Research in Learning and Instruction* is researching the human learning process, basic instruction processes, college-level instruction, and economic factors in innovative college instruction. Newly affiliated with Stony Brook is the *Institute for Advanced Studies of World Religions* which seeks to facilitate the study and development of world religions and philosophy with emphasis on Buddhism, Islam and Hinduism. The Institute's library holdings include 22,000 reference volumes in more than 20 Asian and European languages as well as periodicals and microfilm copies of basic texts and manuscripts.

Library

The Frank Melville, Jr. Memorial Library is housed in a new building located at the heart of the Stony Brook campus. Branch libraries in the Departments of Chemistry, Earth and Space Sciences, Mathematics-Physics, and Engineering are located in their respective academic buildings and are administered by the central library. Holdings in campus libraries total 700,000 volumes at present, and plans call for the addition of new volumes to the collections at the rate of 80,000 volumes each year. The libraries subscribe to 6200 periodical titles. Specialized departments in the Melville Library include the microforms collection and reading room, music library and listening facility, government documents collection and reading room, environmental service and department of special collections.

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 Asian studies, black studies, comparative literature, elementary education, environmental studies, Ibero-American studies, linguistics, religious studies and social sciences. Additional interdisciplinary programs are being considered.

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.

The College of Engineering with five departments—applied mathematics and statistics, computer science, electrical sciences, materials science and mechanics—grants the Bachelor of Engineering degree.

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 business, law, and medicine. Recommended sequences of courses in these fields are listed in the College of Engineering section of this *Bulletin*.

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 305); more detailed information can be found in the separate *Health Sciences Center Bulletin.*

FACILITIES, SERVICES AND ACTIVITIES

Student Services

Student services—including housing, admissions, records and studies, health services, psychological services, financial aid, general and vocational counseling, job placement information, international student advisement, and the Stony Brook Union—are offered by several university offices. Students are encouraged to seek advice and assistance through these various services. The central office of student affairs, located on the third floor of the Administration Building, serves and offers direction to the other services in student affairs.

Housing

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.

Furnishings include bed and mattress, bureau, study desk, and chair and closet. 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 at least a minimum Ten-Meal Plan.

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 1972-73 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. The University will integrate additional married student housing units within the residence halls for the 1973-74 academic year.

Also during the 1972-73 year a commuting student center was established in the residence halls offering a study/meeting place and overnight facilities for commuting students at a nightly rate. The University will be able to offer the use of this facility again in the fall.

In addition the University makes available housing for students of other local colleges that do not have their own housing facilities.

Inquiries and information regarding any of these special housing programs can be obtained by writing to:

Director of Residential Facilities
Room 250
Administration Building
State University of New York
Stony Brook, New York 11790

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

A staff of trained psychologists, experienced in helping students with personal, emotional, educational and social problems, is available through *Psychological Services.* This office is intended for students who have problems of a psychological nature or who are experiencing considerable difficulty in adjusting to university life and its demands.

The *University Health Service* provides emergency services to the entire campus community 24 hours a day, seven days a week. In addition, students are entitled to general medical and certain specialty services, including mental health; dental care is not currently available. Non-emergency cases requiring evaluation by a physician are generally seen on an appointment basis; nurses are always ready to see patients and to arrange for any further care that is needed. These services are covered

by tuition fees. However, the student is responsible for paying for any medications which are not stocked in the Infirmary, laboratory tests which cannot be performed on campus, X-rays, consultations with, visits to and surgery by off-campus doctors, visits to hospital emergency rooms and hospitalization. Students who do not have their own health insurance are urged to subscribe to the accident and sickness policy offered by the University, so that these additional services will not become too great a burden. Many independent study and service groups staffed by students operate under the aegis of the University Health Service, such as the Ambulance Corps, the Office of Health Education, the Red Cross Youth Group, the Sickle Cell Organization, EROS, and the Health Professions Society.

The *Guidance Services Bureau* consists of the offices of Career Development (Placement) and Counseling and Testing. The basic function of the bureau is to assist the individual in the evaluation and exploration of his academic, educational, and vocational objectives, and to help him to arrive at meaningful plans and decisions. The bureau maintains a library of vocational information, graduate school bulletins and professional school information. In addition, information about testing for professional or graduate school admission may also be obtained here.

The *Residential Advising Staff* (currently eight in residence) responds to expressed student interpersonal, developmental, educational and personal needs. The residential advising staff holds office hours in both the residential colleges and the Univerity Mental Health Clinic. The staff also provides opportunities for informal contacts with residential and commuting students. Response to personal emergencies on campus by the Residential Advising staff is competent, local, immediate and supported by all necessary University and extra-university services.

The staff of the *International Student Office* is available to assist 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, and speaking engagements.

The *Stony Brook Union,* as the 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 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 building provides many services and conveniences for the campus community. The dining facilities in the cafeteria include a snack bar, grill, and vending machines. In the Buffeteria, the restaurant on the second floor, there is full liquor service. The recreational facilities include a 12-lane bowling center, a 20-table billiards center, and an amusement machine room. Also included in the building are a ballroom, bookstore, supermarket-delicatessen called "The General Store," a little theatre, post office substation, barber/beauty shop called "The Uni-Sex Tonsorial Parlor," lounges, reading room, campus radio station WUSB, student government, club offices, duplicating and printing service, and the student newspaper, "The Statesman."

Two facilities that are student run programs are the craft shop and the coffee house.

The craft shop offers non-credit informal out-of-classroom courses. Paid student instructors have taught ceramics, pottery, postermaking, silk-screening, macramé, needlework, and leatherwork. Two courses initiated recently are "creative recycling," and "clothes art." Other craft shop activities include art exhibits, gallery receptions, films, photography/darkroom.

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 coffee and conversation hour featuring popular campus personalities; and a weekly music series featuring campus musicians, primarily presenting programs of jazz, folk, eastern, rock and barbershop sounds.

The Broken Door Coffee House Club, a student run club, has been open weekdays from 11:30 a.m. to 4:00 p.m. and Friday and Saturday nights from 9:00 p.m. to 1:30 a.m. The club offers music, food, performers, films and closed-circuit video tape specials.

The Recreation Committee has organized and directed tournaments for over 200 students and has sought sponsorship to send representatives to a regional tournament.

The Videotape Group, Channel VX-T produces shows and commercials, presents special videotape programs and conducts videotape workshops. Membership on the Stony Brook Union Program Committees is open to all students.

Campus Activities

A wide variety of lectures, seminars, concerts, exhibits, theatrical performances, and movies are scheduled regularly during the academic year. Some recent speakers at Stony Brook have included Norman Mailer, author; R. D. Laing, psychiatrist; Daniel Ellsberg, Pentagon critic; Peter Goldmark, communications research pioneer; Harold Smith, biologist;

Edward Zigler, former Director of the Office of Child Development in the Department of Health, Education and Welfare; and Jerome Kagan, psychologist. There is a continuing round of solo and group concerts by outside professionals and by students and faculty; and there are continuing exhibitions of works by artists on and off campus. Movies—both vintage and avant-garde—are shown regularly on campus.

Recent theatre productions have included *Peer Gynt* by Ibsen, *Miss Jairus* by Michael de Gahelderode, Shakespeare's *Twelfth Night, You're a Good Man Charlie Brown* and *A Funny Thing Happened on the Way to the Forum.*

The Student Activities Board sponsors concerts, which have recently included performances by Hot Tuna, New Riders of the Purple Sage, Curtis Mayfield, Pharaoh Sanders, Jonathan Edwards, Steve Miller and many others.

In almost every academic area at Stony Brook a student club supplements course work and arranges social gatherings, field trips, and lectures. Any group of 20 students wanting to get financing for a new club may do so by submitting by-laws to Polity, the student government.

Religious organizations serving students include the B'nai Hillel Counselorship, Christian Science Organization, Inter-Faith Forum, Lutheran Students Group, and Newman Community.

Black Students United, the Chinese Association, and the International Club meet student interests in varied cultural traditions.

Political organizations on campus include such divergent groups as the Organization for Progressive Thought, Students for a Democratic Society, Young Americans for Freedom, the Young Democratic Club, and the Young Republican Club.

ADMISSION

Undergraduate Admission to the University

(College of Arts and Sciences, College of Engineering)

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. 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 freshmen entering the Colleges of Arts and Sciences and Engineering on the basis of high promise demonstrated by means other than the normal academic criteria. Such criteria as unusual creative ability in art, music, theatre, dance, writing, special academic achievement, leadership potential, ethnic background/cultural difference, 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 to the College of Arts and Sciences and the College of Engineering only. 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 Physicians' Associate certificate program—begin in the junior year. The section on the Health Sciences Center in this *Bulletin* and the separate *Health Sciences Center Bulletin* provide information on the application procedure for transfer students and for current Stony Brook students who are interested in being admitted to the 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 poverty-level students 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.

Applicants for AIM should contact their school guidance office, or AIM Admissions, State University of New York at Stony Brook, Stony Brook, N. Y. 11790 for detailed application and eligibility information. AIM applicants are urged to make an appointment for an interview.

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. 11790. The packet includes an Application For Admission to Undergraduate Study (hereinafter referred to as Application), a pamphlet entitled "How to Apply For Admission" giving complete application instructions, and an envelope for mailing the Application. When the Application is received by the Admissions Office from the Admissions Processing Center (APC), an additional form, the Supplementary Questionnaire (SQ) with full instructions will be sent to each applicant.

Applicants for September, 1974, are strongly urged to file a completed application during the preceding fall which must be received in the Admissions Processing Center in Albany no later than January 15, 1974.

Applications received after January 15 by APC in Albany will be considered for the remaining vacancies, if any exist. It is the student's responsibility to insure that the completed Application arrives at APC,

Albany, by January 15. It is also the student's responsibility to insure that all required supplemental materials are received at the Stony Brook Admissions Office by January 15 or within two weeks of the date subsequent to January 15 that the materials are mailed to the applicant. The University reserves the right to close Fall, 1974 application consideration at any time after January 15.

Applications for admission to the Spring, 1974 semester must be filed by October 15, 1973.

Examinations

Applicants (freshmen and transfers with less than 24 semester hours credit) from New York State high schools are required to submit either Regents Scholarship Examination (RSE) scores, the CEEB Scholastic Aptitude Tests (SAT), or the American College Testing Program (ACT). Applicants are urged to submit test scores for each examination they have taken.

If the SAT or ACT is used to meet the entrance examination requirement, the test should be taken in sufficient time to insure that the scores are received by Stony Brook no later than January 15.

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 request the scores be forwarded to the Admissions Office. High 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 application has been completed in the Admissions Office. Group discussions also are available led by trained undergraduate students which have proved very effective in explaining Stony Brook and responding to student concerns. 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. Although the Admissions Office is not open on weekends, student guides frequently are available on schedule in the reception area on weekends during both the school year and Summer Session. It is best to telephone during the week to confirm weekend tour schedules.

Transfer Students

A. General Information

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 outlined for new freshmen in the "How to Apply" booklet, 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 Admissions 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 Request 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 an 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 in this *Bulletin* and to information in the separate *Health Sciences Center Bulletin* for information on 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., and A.A.S. in Engineering Science 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 of priorities. Graduates of career-oriented programs (A.A.S.) will be considered for admission on an individual basis and in competition with all 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 September, 1974 admission. (Applicants for admission to the Spring, 1974 semester are reminded that applications are not available until September, 1973, which must be received by APC by October 15, 1973. Applications accepted for consideration after October 15, 1973, 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 preregistration, 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 year 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., A.S., or A.A.S. degree in Engineering Science. However, individual class programs will not be issued to students who pre-register nor will students who do not preregister 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 Admission 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 program of part-time matriculation was inaugurated by the University in September, 1972. The 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.

The University will consider applications only from students who have earned a minimum of 57 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 should contact the Admissions Office for additional information and instructions for filing an application.

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 (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.

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, 1974, will be mailed beginning February 15. It is expected that freshmen decisions will be mailed beginning the middle of 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 a 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) prior to enrollment at Stony Brook must present evidence of receipt of the degree before registration. ALL transfer students must present a final transcript to the Stony Brook Admissions Office PRIOR to final registration. Requirements for the certification 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 responsibilty 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 for consideration 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 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 and 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. These deposits, payable upon tentative or conditional acceptance of the offer of admission, are applied against charges incurred by the student in the first semester.

A 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. Offers of admission made after April 1 are valid for 30 days from the date admission is offered, and written requests for refunds must be received within this same time.

Part-Time Non-Matriculated Students

A limited number of students may enroll each semester as part-time non-matriculated undergraduates. High school students who have completed their junior year, high school graduates, and individuals who have received a bachelors degree are eligible to apply, provided they wish to take only undergraduate courses. Those who are accepted into this program are admitted for *one semester only* and normally take less than twelve credits of work. The Admissions Office will consider requests to

carry more than twelve credits. There is no separate undergraduate evening division; part-time non-matriculated students choose from among regularly scheduled classes and register as space permits.

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. Part-time non-matriculated students who wish to apply for matriculation may secure the appropriate forms in the Admissions Office. Attendance as a part-time non-matriculated student does not necessarily accrue special consideration for admission subsequently as a matriculated student.

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 part-time non-matriculated student application, and arrange for an interview with either a guidance or admissions counselor. Stony Brook students who wish to complete degree requirements as part-time non-matriculants must follow the above schedule and also secure a residency requirement waiver from the Committee on Academic Standing. Admission will be on a competitive, space-available basis. Students in this situation should also consider continuing as part-time matriculants. 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 sent usually 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 51. The Visiting Student Program is described on pages 49 and 50.

FINANCIAL INFORMATION

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. Tuition and fees are based on the schedule printed below, lower division being 56 credits or less, upper division being more than 56 credits. All fees and charges are subject to change without further notice.

Charge or Fee	First Semester	Second Semester	Year
Tuition			
Undergraduates:			
N.Y. State resident— Lower Division	$ 325.00	$ 325.00	$ 650.00
N.Y. State resident— Upper Division	400.00	400.00	800.00
Non-resident— Lower Division	537.50	537.50	1,057.00
Non-resident— Upper Division	650.00	650.00	1,300.00
Graduates:			
N.Y. State resident	600.00	600.00	1,200.00
Non-resident	750.00	750.00	1,500.00
Professionals (medicine, dental medicine):			
N.Y. State resident	800.00	800.00	1,600.00
Non-resident	1,000.00	1,000.00	2,000.00
Part-time Undergraduates: (Charge per semester credit hour)			
N.Y. State resident— Lower Division	21.50	21.50	
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	

	First Semester	Second Semester	Year
Part-time Graduates:			
(Charge per semester credit hour)			
N.Y. State resident	40.00	40.00	
Non-resident	50.00	50.00	
Part-time Professionals:			
(Charge per semester credit hour)			
N.Y. State resident	53.50	53.50	
Non-resident	66.75	66.75	
College Fee			
Full-time student	12.50	12.50	25.00
Part-time student (per semester credit hour)	.85	.85	
[a]*Student Activity Fee* (Undergraduate)	35.00	35.00	70.00
Identification Card (On admission or re-admission)	2.00		
[b]*General Univerity Deposit*			
Commuting Student	20.00		
Resident Student	35.00		
[c]*Orientation*			
Freshmen	44.00		
Transfer Students	10.00		
[d]*Graduation Fee*	15.00		
Late Registration Fee	15.00		
Advance Tuition Deposit (Freshmen and transfers only)	50.00		
Advance Housing Deposit (Freshmen and transfers only)	75.00		
Room			
Double Occupancy	325.00	325.00	650.00

[a] This fee is set by Polity.

[b] To be charged for any damages to property, unpaid telephone charges, unpaid library fines and other charges due.

[c] Includes orientation fees and charges for room and board.

[d] Required in the year that the candidate will receive his or her baccalaureate, masters, or doctoral degree.

Payment of Fees and Charges

All fees and charges for a given academic session are due and payable prior to the first day of classes. Students making payment on or after the first day of classes, during the late registration period, shall be required to pay a late registration fee of $15. This fee may not be waived. The late registration period ends at the close of the second week of classes.

Award Credit

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

Award credit may be granted to undergraduate students for the following types of awards:

1. *Regents College Scholarships and Regents Scholar Incentive Awards:* All New York State undergraduate residents are encouraged to file for Regents Scholar Incentive 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 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 be certified for an award credit upon presentation to the Financial Aid Office of the stub from the Regents Scholarship and/or Incentive Award Notice from the previous year, and the return receipt from the Regents Scholarship Examination Center for the present year's application.

2. *National Direct Student Loan, EOG, (EOP) AIM:* 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. Award credit will be granted upon presentation of the award letter to the Bursar's Office.

3. *Veterans' Education Benefits:* Students who are eligible for veterans benefits should obtain an application from the Registrar's Office. Incoming students who are veterans are advised to contact the Registrar's 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.

4. *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 University and the student, the student will be required to complete a power of attorney form at the Bursar's Office in order to receive an award credit.

Hardship Deferments

Students experiencing severe financial hardship based on extraordinary personal circumstances may request deferment of financial charges for tuition, room and board. Such requests should be made in the Student Affairs Office (third floor Administration Building) *before registration.* 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 deferment.*

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.

Insurance

Insurance is each student's responsibility. The University recommends that all students be covered by insurance which may be obtained at registration through insurance company representatives who will be available at that time.

Deferment

All fees must be paid or properly deferred prior to the first day of classes to complete registration. All students registering or completing payment after the first day of classes must pay all fees or properly defer them and in addition must pay the late registration fee of $15.00. Deferment will only be granted for tuition, room and Meal Plan. All other charges are due and payable upon registration.

Proper deferment consists of providing to the Student Accounts Office the following:

1. *For Regents/Scholar Incentive Awards*—presentation of award certificate.
2. *For National Direct Student Loan and Educational Opportunity Grants*—presentation of award letter from Financial Aids Office.
3. *For Private Scholarships*—presentation of an award letter from the sponsor indicating the amount of the award, the term covered by the award, whether the award is restrictive or not, and if restrictive, indicating restrictions.
4. *For Vocational Rehabilitation*—presentation of an award letter indicating amount of award and period covered from Office of Vocational Rehabilitation. All such letters must be accompanied by a Scholar Incentive Award certificate, if applicable.
5. *For Veterans Whose Education Benefits are Paid to the University*—presentation of an Eligibility Award Certificate from Veteran's Administration when the Veteran's Administration pays directly to the University.

All students who have not completed the payment process by the end of late registration will not be considered registered students and may not register after that date. Late registration ends two weeks after the first official day of classes.

Refund Schedule

Request for refund of tuition or room must be made in writing to the Office of Student Accounts, Room 262, Administration Building, after approval by the Registrar or Housing respectively.

Request for refund of student activity fee must be made in writing to the Polity Office, Stony Brook Union Building.

Request for refund of university deposit, lost I.D. card or graduation fee must be made in writing to the Faculty Student Association Office, Room 282, Stony Brook Union Building.

College fee is non-refundable.
Cooking fee is non-refundable.

A student or special student who is given permission to cancel registration shall be liable for payment of tuition in accordance with the following schedule. A withdrawal card which is obtainable at the Office of Records and Studies, must be completed and returned to that office on the date of withdrawal. Refunds will be calculated based upon the date of withdrawal which is the date the Office of Records and Studies reviews the request.

Schedule of Tuition Liability

Liability During	Semester	(Six-Week Term Summer Session)
First Week	0	0
Second Week	30%	70%
Third Week	50%	100%
Fourth Week	70%	
Fifth Week	100%	

Approval of the cancellation with the date it becomes effective must be certified by the chief administrative officer of the college or his duly designated representative. 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. 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.

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 the 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.

Exceptions

A. 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.

B. A student who is dismissed for academic or disciplinary reasons prior to the end of an academic term shall be liable for all tuition and fees due for that term.

Room Refunds

Once a student has registered and occupied a room, no refund will be granted for payment made for the quarter.

Preadmission Deposit and Refund Policy

Each new student is required to pay an advance tuition deposit of $50 and when housing is offered an additional $75 deposit. These deposits, payable upon tentative or conditional acceptance, are applied against charges incurred by the student in the first semester.

A refund for tuition or room deposit 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.

1973 Summer Session

Expenses for the 1973 Summer Session are as follows:

Tuition	
Undergraduates (N.Y. State Resident) Lower Division	$21.50 per cr. hr.
Undergraduates (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	
College Fee	$ .85 per credit hour
*General University Deposit	20.00 commuting students
*General University Deposit	35.00 resident student
**Student Service Fee	5.00
Rooms	
Summer Double Occupancy (six-week session) Rate per person	$84.00

* Applies to all students except those registered in the previous Spring semester who have an outstanding deposit. The fee is refundable at the end of the Summer Session.

** Funds collected from the service fee will be used to finance extracurricular activities during the summer such as dances, concerts, films, the operation of the Stony Brook Union, group trips, and recreational facilities such as intramural softball competition, the use of the swimming pool and all other gymnasium-related activities. Administration of the funds collected will be performed by the Summer Session Student Service Fee Committee, chaired by the Director of the Summer Session and consisting of representatives from Polity, the Graduate Student Council, the CED Student Council, the university administration, faculty, and staff.

Financial Aids

The Financial Aids 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 may be gotten from the Financial Aids 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.

NOTE: Due to the present uncertain legislative status of the federal financial aid programs for 1973-74, the Financial Aids Office is not able at this time to publicize which programs will be available. Further and more up-to-date information may be obtained directly from the Financial Aids Office.

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 $15. 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 with 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 adviser each student selects a program of courses, and it is the student's responsibility that the program conforms with academic regulations and meets with 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

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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.

of the second week. After that date, a course may be added only with the approval of the Committee on Academic Standing (See page 47 "Committee on Academic Standing").

From the third through the ninth week,* a course may, within the regulations, be dropped (See page 43 "Course Load" and page 44 "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.

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. 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, loans, and selective service.

Selection of Major

In general, before the end of the sophomore year, each student is expected to select an academic major in order to plan a program more effectively with an academic adviser in the student's major department or program. The academic adviser is usually assigned for the last two years of university work.

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* Last day for undergraduates to drop courses without withdrawing from the University is presently under review. Contact Office of Records for final dates.

Students who wish to enter one of the upper-division programs in the Health Sciences Center should note that they must file an application and be formally accepted.

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 advanced 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.

Change of Major or Change to a Double Major

In order to change from one academic major to another, students must obtain a Change-of-Major card from the Office of Records. They must then obtain the approval of their present adviser, the chairman of the department of their present major, and the chairman of the department in which they wish the new major. The card is then returned to the Office of Records where a student's records are changed accordingly.

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

In order to be cleared for a *double major,* a student must first obtain the approval of the Undergraduate Studies Office.

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.

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 registered in a year-long course for which the final grade will be assigned ony 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 (including grades of Incomplete) 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. Graduating students wishing to make up incomplete work taken in a previous semester must file an application to postpone their graduation until the end of the following term.

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. In each semester election of the P/NC option is limited to a period at the beginning of the 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 adviser should be consulted.

Grade Point Average

For the purpose of determining the grade point average specified in degree requirements, certain grades are assigned 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 values as for the grades shown above, the grade point average is found by multiplying the number of credit hours for each course by the grade value for the course, 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, 24-54; junior, 55-84; 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 or begun after four semesters of registration). 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.

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

Exceptions to regulations regarding such matters as registration changes, course loads, grade options, 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 or the Guidance Services Office.

Academic Honesty

During the summer of 1971 a commission of faculty and students worked out a set of guidelines to deal with questions of academic honesty. Their recommendations have been published as "Procedures Governing Cases of Academic Dishonesty," which are distributed to all undergraduate students and to faculty who teach undergraduate courses. Requests for additional copies of the procedures or suggestions for improving standards of academic honesty in undergraduate courses should be directed to the Clerk of the Hearing Board on Academic Dishonesty, in the Undergraduate Studies Office.

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 entrance to the junior year or begun after four semesters of registration.

Residence Requirements

For a student to be certified for a degree, he or she must have been registered as a full-time student at the University for the two semesters immediately preceding graduation.

Departmental Honors Program

Some departments of the University offer departmental honors programs. Specific requirements must be met in order for a student to be eligible to participate in the programs. Such programs are described in the departmental section of the *Undergraduate Bulletin*. 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 at the time of advance registration in the spring semester preceding the senior year. Transfer and readmitted students expecting to graduate in December or May *must* file an application no later than the first of the preceding October, and those expecting to graduate in August *must* file no later than the first of the preceding May or by June 30 in the case of students not enrolled in the preceding spring semester. The graduation fee is $15.

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. No changes of grade (including Incomplete 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.

Transcripts

Students who desire transcripts of their academic record at Stony Brook, either for their own use or for forwarding to some other institution 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 $1 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 who have *graduated* will be provided with two free transcripts upon request to the Office of Records.

Study at Other Institutions

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

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 adviser 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 receipt by the Admissions Office of 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 the large academic communities such as Stony Brook.

To qualify for the program a student must have the advance approval of his or her academic adviser 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 is currently expanding its sponsorship of 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. Among present SUNY offerings is, for example, a full-year program at the University of Nice, France, which Stony Brook co-sponsors with other university centers. Other programs already exist or are being developed to allow study in Canada, Great Britain, and other European countries, Latin America, Africa, Asia, and the Middle East.

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 the academic adviser or department chairman to make sure that courses are suitable for transfer credit. Information about SUNY-sponsored programs and other opportunities for study abroad can be obtained in the Office of the Director 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 at the Admissions, Records, and Guidance Services Offices. Exit interviews may be arranged with either Admissions or Guidance Services personnel.

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 in each course. A withdrawal after final class day 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 dismissed 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 certified 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 time table 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
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 credits

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 credits

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, 102.

C. Social and Behavioral Sciences
Two semester courses, to be chosen from among the offerings of the following departments or interdisciplinary programs: anthropology, Asian studies, black studies,** economics, education, history, Ibero-American studies, political science, psychology, Puerto Rican studies,** social sciences interdisciplinary program

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* See information on advanced placement and the Challenge Program examinations as a means of earning semester hour credit toward graduation, page 32 of this *Bulletin*.

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

and sociology. (Student teaching courses may not be used to meet this requirement.) ..... 6-8 credits

D. Arts and Humanities
Two semester courses, to be chosen from among the offerings of the following departments or interdisciplinary programs: art, black studies,** Chinese, classics and classical languages, comparative literature, English, French, Germanic and Slavic languages, Hebrew, Hispanic languages, Italian, linguistics, music, philosophy and theatre arts .....6-8 credits

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

1. Art: the first two semesters of the studio courses ART 120, 121, 122, 123, 124, 126.
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. Physical Education
Two semester courses, which may be taken at any time prior to graduation, or participation in intercollegiate athletics. No academic credit is given.

The Physical Education requirement may be waived for students presenting appropriate documentation to the Office of Records confirming their having met one of the following conditions: (1) previous active military, Peace Corps, or VISTA service, (2) 27 years of age or older at the time of matriculation, (3) motherhood. Students may petition the Department of Physical Education for a waiver of the physical education requirement for medical reasons.

F. Academic Standing
For graduation at least 120 credit hours of passing work must have been completed, with a cumulative grade point average during the last four semesters of at least 2.00, i.e., C-level.

G. Residence Requirement
To be certified for a degree, candidates must be registered as full-time students at the University for the two semesters immediately preceding graduation.

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

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 E may be granted upon recommendation of the department or other agency supervising the course. Questions about requirements F and G should be addressed to 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, 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:

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 adviser 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. As of September 1973, nine interdisciplinary programs have been approved: Asian studies, black studies, comparative literature, elementary education, environmental studies, Ibero-American studies, linguistics, religious studies, and social sciences. They are described in more detail in this section of the *Bulletin* under individual headings alphabetically arranged. Additional interdisciplinary programs are currently being considered, as well as additional courses within the already established programs. For further information consult the Undergraduate Studies Office.

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*. Advisers 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 deadline for submitting proposals is announced early each semester for the following semester. 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 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.

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 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 fulfill the requirements of the undergraduate program in engineering science in the College of Engineering and the requirements of an established degree program in the College of Arts and Sciences.

ELEMENTARY AND SECONDARY TEACHER PREPARATION

To prepare students to become teachers in either elementary or secondary schools, the University offers programs which are guided by the university committee on teacher preparation. Students who complete Stony Brook's approved sequences are eligible for provisional teacher certification by New York State.

Students interested in preparing to teach in the elementary schools should plan to fulfill the requirements of the interdisciplinary major in elementary education (EED), which is outlined on page 132 of this *Bulletin.*

Students intending to teach at the secondary school level should plan to complete the requirements of either a departmental major or an interdisciplinary major and should consult the Education Departmen' for assistance as early as the second semester of the freshman year.

DEPARTMENT OF ANTHROPOLOGY

Professors: P. BROWN *(Director of Graduate Studies),* [a]CARRASCO, FARON

Associate Professors: STEVENSON *(Director of Undergraduate Studies),* WHEELER

Assistant Professors: ARENS, R. GARDNER, HICKS, R. JONES, NEWTON *(Museum Curator),* REGELSON, [a]J. STARR, WEIGAND *(Chairman)*

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 anthropology major with an academic background preparatory to a graduate program in anthropology. The curriculum emphasizes the fields of cultural, social and ecological anthropology.

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:

A. Study within the area of the major for a total of 24 credits:
   1. ANT 102 Introduction to Social and Cultural Anthropology.
   2. ANT 200 Foundations of Social Anthropology, or old course, ANT 150, no longer offered.
   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 209, 217, 257, 258, 259, 260.
   6. One advanced seminar to be selected from the following: ANT 301, 303, 304, 306, 308, 391, 392.

B. A selection of six additional credits, either among listed departmental course alternatives or appropriate courses in other departments with the approval of adviser. Examples are: BLS 102, BLS 259, EDU 397, ENS 201, HIS 197, HIS 265, IAS 121, IAS 122, LIN 371, SOC 203, SOC 235, SSC 301.

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[a] On leave academic year 1973-74.

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 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 27 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 IN ANTHROPOLOGY

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

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

S. Regelson, M. Wheeler

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.

Fall, 3 credits

R. Jones

ANT 204 Peoples of Africa

The range and distribution of African populations, languages and socio-cultural systems are surveyed in both full historic 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, S. Regelson

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
Staff

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
Staff

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 patterns, 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
Staff

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
Staff

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. Not offered for 1973-74.

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
Staff

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
Staff

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 257 The Past of the New World

The peopling of the New World and the processes of development of aboriginal American cultures from the beginning to the era of European expansion. An interpretative summary of archaeological evidence in terms of culture history showing how it relates to the general theory of cultural evolution and the post-Columbian history of the Americas.
Prerequisite: ANT 102.

3 credits

E. Lanning

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. Not offered 1973-74.

P. Weigand

ANT 260 Archaeological Studies in Society and Culture

Basic concepts and methods of archaeological research applied to the study of sociocultural processes and to historical interpretation.
Prerequisite: ANT 102.

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 102.

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.

Fall, 3 credits

S. Regelson

ANT 266 Anthropology Museum Workshop

Advanced workshop and projects in material culture, technology and primitive art. Students will participate in designing and construction of museum exhibits which will entail background study and individual research in this field.
Prerequisites: ANT 102 and 255 or permission of instructor.

Spring, 3 credits

D. Newton

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 structure of a selected range of societies.

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 peoples 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 also 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.
Prerequisite: Advanced standing or permission of instructor.

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.
Prerequisite: Advanced standing or permission of instructor.

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.
Prerequisite: Advanced standing or permission of instructor.

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 204 and advanced standing or permission of instructor.

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.
Prerequisite: Advanced standing or permission of instructor.

Fall, 3 credits

Staff

ANT 310 Readings in Anthropology

Individual advanced readings and research on selected topics in anthropology. Work may be submitted for honors in anthropology.
Prerequisites: Senior standing and permission of department.

Fall and Spring, 1 to 4 credits
Staff

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: Advanced standing or permission of instructor.

Fall, 3 credits
P. Weigand

ANT 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 LIN 371.
Prerequisites: LIN 201 and LIN 211.

Spring, 3 credits
S. Regelson

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: Advanced standing or permission of instructor.

Fall and Spring, 3 credits each semester
Staff

DEPARTMENT OF ART

Professors: ALLOWAY, [a]CASTEDO, GUILMAIN *(Chairman)*, MORLEY

Associate Professors: COUNTEY, KLEEGE, KORAS, MALLORY, WHITE *(Part-time)*

Assistant Professors: DES GRANGES *(Adjunct)*, FRANK, HEILMANN, LEFKOWITZ *(Adjunct)*

Lecturers: BARNITZ, BERMAN, INKE, LINDGREN, TING

Adjunct Lecturers: C. KOPPELMAN, LUSARDI

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.

[a] On leave academic year 1973-74.

The department recommends that students who intend to do graduate work in art history acquire a reading knowledge of German and/or French as part of their undergraduate training.

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 60 credits of studio work, as courses or independent studies, to be counted towards degree requirements.

	Credits
I. Group A. Art History and Criticism	
1. ART 101, or with permission of the departmental adviser, ART 203 *or* ART 204	3
2. ART 102 or with permission of the departmental adviser, ART 205 *or* ART 207 *or* ART 208 *or* ART 209 *or* ART 210 *or* ART 212 *or* ART 351 *or* ART 352	3
3. ART 241 *or* ART 243 *or* ART 244	3
4. Electives in Art History and Criticism (ART 125 may be included in this group for no more than three credits.)	6
Total	15
II. Group B Studio Art (or Art History track alternate)	
1. Fifteen credits in any combination of studio courses including ART 120 or,	
2. Art History and Criticism track: 15 additional credits in art history/criticism.	
Total	15
III. Electives in related fields	
In consultation with the departmental adviser, a group of courses outside the Art Department related to the student's particular interest or interests are selected.	
Total	9
Grand Total	39

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 member of faculty 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 is dependent 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 adviser. 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 adviser.

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 IN ART

Prerequisites for all courses can be waived by permission of department.

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

C. Lindgren, N. Mallory

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, S. Frank

ART 120 Fundamentals of Drawing, Composition, and Design

An introductory course intended for non-art majors. Emphasis will be on drawing techniques. Six hours studio work. Prerequisite: Permission of instructor.

Fall and Spring, 3 credits

M. Heilmann

ART 121 Studio I (Drawing)

A course in drawing, the basis of pictorial art. Intended for art majors. Emphasis will be on life drawing. Six hours studio work. May be repeated once with departmental permission.
Prerequisite: Permission of department.

Fall and Spring, 3 credits

G. Koras

ART 122 Studio II (Introduction to the Techniques of Sculpture)

A beginning course designed to introduce the student to the techniques and formal principles of sculpture. Studio exercises in the uses of sculptors' tools and simple problems in three-dimensional design are supplemented by some lectures and recitations on the formal principles of sculpture as a medium. Six hours studio work. May be repeated once with departmental permission.
Prerequisite: Permission of department.

Fall and Spring, 3 credits

G. Koras

ART 123 Studio III (Introduction to the Techniques of Painting)

A beginning course designed to introduce the student to the techniques and formal principles of painting. Studio exercises in

various media: watercolor, oil, tempera. Pure color theory and its relation to the various media. Six hours studio work. May be repeated once with departmental permission.
Prerequisite: Permission of department.

Fall and Spring, 3 credits

E. Countey

ART 124 Studio IV (Design)

A studio course in the techniques of perspective drawing, isometric projection, multiphase drawings, motion studies, graphs, and analytical drawings, and their application to a selected project. Six hours studio work. May be repeated once with departmental permission.
Prerequisite: Permission of department.

Fall and Spring, 3 credits

J. Kleege

ART 125 Applied Theory Studio

A workshop in painting combined with the study of modern art theories. Experimentation with problems of scale, color, structure and surface will be emphasized. Six hours studio work. May be repeated once with departmental permission.
Prerequisite: Permission of department.

Fall and Spring, 3 credits

M. Morley

ART 126 Fundamentals of Photography

An introduction to photography as a graphic medium with experimentation in photographic techniques and materials.
Prerequisite: Permission of department chairman.

Fall and Spring, 3 credits

L. Lefkowitz

ART 200 Greek Art and Architecture

The study of ancient Greek art and architecture from the earliest beginnings in the geometric period through the archaic, classical and Hellenistic periods.
Prerequisite: ART 101.

Fall, 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, Judaea, Syria, Egypt, Cyrenaica and Tunisia.
Prerequisite: ART 101.

Spring, 3 credits

C. Lindgren

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

The history of early Christian and Byzantine art, and the Germanic and Anglo-Irish traditions, the Carolingian "Renaissance," the Ottonian, Mozarabic and Anglo-Saxon schools.
Prerequisite: ART 101.

Fall, 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.

Spring, 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, 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 Bellini and Titian. Mannerisms in central and northern Italy.
Prerequisite: ART 101 or 102.

Fall, 3 credits

N. Mallory

ART 208 Western Architecture from the 15th to 19th 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 201.

Spring, 3 credits

N. Mallory

ART 209 Northern Renaissance Art

Painting in Flanders and Germany in the 15th and 16th centuries.
Prerequisite: ART 101 or 102.

Fall, 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, 3 credits

N. Mallory

ART 212 Baroque Art and Architecture in Spain and Italy

The study of the art and architecture of Italy and Spain in the 17th century. Special emphasis will be placed on the contributions of such major figures as Caravaggio, Bernini, Borromini and Valasquez.
Prerequisite: ART 102.

Spring, 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, 3 credits

Staff

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, 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, 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 215.

Fall, 3 credits

Staff

ART 218 The Architectural History of Town Planning

A study of physical structures and social patterns of settlements. The course will focus on definitions and analyses of cities and communities of many sizes and types, and from many periods and places.
Prerequisites: ART 101 and ART 102.

Spring, 3 credits

S. Frank

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.

Fall, 3 credits
L. Ting

ART 220 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, 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, or permission of instructor.

Fall, 3 credits
Staff

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, 3 credits
G. Berman

ART 241 19th Century Art

European art of the 19th century.
Prerequisite: ART 102.

Fall and Spring, 3 credits
S. Frank

ART 243 20th Century Art

European and American art of the 20th century.
Prerequisite: ART 102.

Fall and Spring, 3 credits
L. Alloway, S. Frank

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, 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 and Spring, 3 credits
S. Frank

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 discussions.
Prerequisite: ART 101 or 102.

Fall and Spring, 3 credits
G. Berman

ART 257 Research in Museum Techniques and Administration

A course conducted at the Suffolk Museum designed to familiarize students with museum techniques and administration. The student will be trained and will participate in exhibit design, library work and research, and in the management of the departments of Administration, Registration, and Education. Students will spend approximately six hours per week at the museum.

Prerequisite: Junior standing, museum interview, and permission of the Art Department.

Fall and Spring, 3 credits

J. des Grange

ART 260 Sculpture Studio A

Sculpting involving the casting of plaster, plastics and metals; and the carving of stone, wood and other substances. May be taken up to four times with permission of department.
Prerequisite: Departmental permission through evaluation of the student's work. ART 122 will generally be required.

Fall and Spring, 3 or 6 credits

G. Koras

ART 261 Sculpture Studio B

Metalwork (welding and related techniques). May be taken up to four times with permission of department.
Prerequisite: Departmental permission through evaluation of the student's work. ART 122 or 124 will generally be required.

Fall and Spring, 3 or 6 credits

J. Kleege

ART 262 Sculpture Studio C

Ceramics, terra cotta. May be taken up to four times with permission of department.
Prerequisite: Departmental permission through evaluation of the student's work. ART 122 will generally be required.

Fall and Spring, 3 or 6 credits

M. Heilmann

ART 265 Drawing Studio

Work in all drawing media. May be taken up to four times with permission of department.
Prerequisite: Departmental permission through evaluation of the student's work. ART 121 will generally be required.

Fall and Spring, 3 or 6 credits

M. Morley, R. White

ART 268 Intermediate Photography

An intermediate level course for those who have mastered basic camera and darkroom techniques. Material covered will include view camera techniques, studio lighting, application of sensitometry to tone reproduction and color photography. These techniques will be applied to projects that will be based on the student's individual interests and needs.
Prerequisites: ART 126 or equivalent and departmental permission through evaluation of student's work.

Spring, 3 credits

L. Lefkowitz

ART 270 Painting Studio

Work in all painting media. May be taken up to four times with permission of department.
Prerequisite: Departmental permission through evaluation of the student's work and knowledge of 20th century art. ART 123 or 125 will generally be required.

Fall and Spring, 3 or 6 credits

M. Morley

ART 275 Graphics Studio

Engraving, etching, aquatint, messotint, dry point, wood cutting, wood engraving, and intaglio color printing. May be taken up to four times with permission of department.
Prerequisite: Departmental permission through evaluation of the student's work. ART 121 or 123 will generally be required.

Fall and Spring, 3 or 6 credits

E. Countey, 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.
Prerequisite: ART 122 or 124 or 125.

3 or 6 credits

L. Lusardi

ART 343 Topics in the History of Architecture

An advanced course, emphasizing specialized topics in the history of architecture

and basic values in design. Iconographic problems of cultural concerns as well as esthetic principles of space, structure, and construction relating to individual buildings, building complexes and communities will be considered. Topics to be announced.
Prerequisite: At least three courses in art history of which at least two are on the 200 level.

Fall, 3 credits
S. Frank

ART 328 Directed Studio Projects

Advanced studio projects in 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 be expected to submit a report or portfolio to the department upon completion of the project. May be repeated with permission of department.
Prerequisites: Sponsorship of a faculty member *and* approval of the department chairman.

Fall and Spring, 3 or 6 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 with departmental permission.
Prerequisite: ART 243.

Fall and Spring, 3 credits each semester
L. Alloway

ART 398 Library Research Methods in Art History

The student, in consultation with a faculty sponsor, selects an art history or art criticism research project requiring fairly extensive library research of moderate difficulty. The project is carried out under the joint supervision of the faculty sponsor and an art librarian, and involves some lectures and class discussion on art bibliographies as well as individual advising sessions.
Prerequisites: At least four courses in art history and criticism and permission of a faculty sponsor.

Fall and Spring, 3 credits
C. Koppelman

ART 399 Readings in Art History

Qualified art majors will be afforded the opportunity to read selectively under the guidance of a faculty member. The course may be repeated with permission of the department.
Prerequisites: Sponsorship of a faculty member and permission of department chairman.

Fall and Spring; 1, 2 or 3 credits
Staff

INTERDISCIPLINARY PROGRAMS IN ASIAN STUDIES

Program Chairman: R. H. G. LEE

Faculty Advisory Committee:

Anthropology—HICKS

Art—TING

Chinese—HU

Economics—HOFFMANN, VAN ROY

History—LAM

Philosophy—DENICOLAS, DILWORTH

Theatre—BRUEHL

The interdisciplinary program in Asian studies (ANS) is designed to provide students with a broad knowledge of Asian cultures and civilizations while requiring them to gain a closer acquaintance with one of the three major regions of Asia: East Asia (China, Japan, Korea and Taiwan); Southeast Asia (Burma, Thailand, Malaysia, Singapore, Cambodia, Laos, Vietnam, Indonesia and Phillipines); and South Asia (India, Pakistan, Ceylon, Bhutan, Sikim and Nepal). At present, the program focuses on East Asia and Southeast Asia. South Asia is not now offered as an area of concentration but will be added eventually.

Requirements for the Major

In addition to the general university requirements for the Bachelor of Arts degree, a student majoring in this program must earn 30 credits distributed in three or more disciplines in Asian studies and related courses. Twelve of these credits must be in one of the above-named major regions of Asia. All senior students will be required to take an interdisciplinary seminar in Asian studies, ANS 391. Faculty members affiliated with the program will serve as student advisers.

Courses in Asian Studies

I. The following courses are offered for the Southeast Asia concentration:

* HIS 263 History of Southeast Asia to 1500
* HIS 264 History of Southeast Asia from 1500 to the Present
** HIS 362, 363, 364 Topics in Asia History
HIS 399 Independent Readings in History
** ECO 284 Topics in Area Studies
ECO 330 Economic Anthropology
ANT 211 Peoples of Southeast Asia and Indonesia
PHI 210 Introduction to Indian Philosophy: Classical Texts
PHI 211 Introduction to Indian Philosophy: Philosophical Schools
PHI 238 Indian Buddhism

II. The following courses are offered for the East Asia concentration:

* HIS 197 Far Eastern Civilization
* HIS 198 The Far East in Transition
HIS 262 Contemporary China
** HIS 362, 363, 364 Topics in Asia History
HIS 399 Independent Readings in History
* ANT 213 China: The Social and Cultural Background
ART 220 Chinese Painting
PHI 212 Introduction to Chinese Philosophy
PHI 239 Chinese and Japanese Buddhism
PHI 307, 308 Japanese Philosophy and Aesthetics
** ECO 284 Topics in Area Studies
THR 254 Asian Theatre

III. Related courses which may be taken to satisfy degree requirements:

HIS 240 History of the British Empire
HIS 256 Expansion of Europe, 1800 to the Present
** HIS 355, 356 Topics in World History
ECO 122 Economics of Socialism
ECO 225 Economic Development
** ECO 384 Topics in Development and Comparative Systems
* ANT 206 Peoples of Asia
ANT 261 Peasant Societies and Cultures
ANT 303 Evolution of the State
ANT 304 Problems in Political and Economic Development
PHI 109 East and West: A Comparative Philosophical Inquiry
PHI 318 The Philosophical Methodology of the Rig Veda
POL 202 Problems in Marxism
POL 209 Politics in Developing Areas

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* Suggested as an introductory course.

** Course content varies according to the interest of the instructor.

IV. 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, problblems 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.*

V. Languages

Students are strongly recommended to take Chinese if they plan to concentrate on East Asia and to take either Chinese, French, Spanish or Portuguese, if they plan to concentrate on Southeast Asia. The language courses are not counted toward the fulfillment of the major requirements. However, students planning to study abroad or enter graduate school will be advised to begin their language training as soon as possible.

VI. International Education

In conjunction with the SUNY international education program, qualified students in the program will be given an opportunity to study abroad in their respective areas of concentration. To obtain the greatest benefit from their foreign sojourn, students are advised to prepare themselves adequately in the languages of their areas of concentration.

ANS 240 Education in Contemporary China

Extensive examination of the educational practice, educational policy and curriculum in the People's Republic of China with emphasis on the interrelationship between political ideology and the educational system.

Prerequisite: Two semester courses in the social sciences.
Fall and Spring, 3 credits.

DIVISION OF BIOLOGICAL SCIENCES

Provost: R. JONES

Department of Biochemistry

Professors: CIRILLO, SHAW *(Adjunct)*, M. SIMPSON *(Chairman)*

Associate Professors: FREUNDLICH, GESTELAND *(Adjunct)*, INOUYE, MOOS, RILEY, STUDIER *(Adjunct)*

Assistant Professors: ARNHEIM, DUDOCK, SARMA, S. SIMON, R. STERNGLANZ

Department of Cellular and Comparative Biology

Distinguished Professor: GLASS

Professors: E. CARLSON, ERK

Associate Professors: BATTLEY, A. CARLSON, EDMUNDS, KRIKORIAN, LYMAN, MERRIAM, TUNIK, [a]WALCOTT *(Chairman)*

Assistant Professors: J. FOWLER, HOY, E. KATZ, KNOTT, D. SMITH, TENG

Department of Ecology and Evolution

Professors: ROHLF, SANDERS *(Adjunct)*, SLOBODKIN *(Chairman)*, SOKAL

Associate Professors: HECHTEL, KOEHN, [a]SMOLKER, TURNER

Assistant Professors: J. FARRIS, FUTUYMA

Faculty Holding Joint Appointments in Division of Biological Sciences:

Professors: E. BAYLOR, [a]G. WILLIAMS, WOODHEAD

Associate Professor: WURSTER

Assistant Professor: V. FARRIS

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[a] On leave Academic Year 1973-74.

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, 299, 313, 320, 363 (described in this *Bulletin*) or BIO 502, 505, 506, 508, 513, 514, 520, 575 (described in the *Graduate Bulletin*)

   2. Chemistry
      CHE 101, 102 or 103, 104 Introductory Chemistry
      CHE 105, 106 or 109, 110 Introductory 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 152 *or* 153 Calculus III
MSA 104 Introduction to Probability
PHY 101, 102 General Physics I, II
PHY 151 General Physics III *or* CHE 315 Intermediate Organic Chemistry *or* CHE 255 Introduction to Quantum Chemistry

(Note: PHY 131, 132 may be substituted for PHY 101, 102 only with special permission of the biochemistry departmental undergraduate 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 adviser, 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 adviser 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 adviser 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 adviser, 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 courses are required for the major in biological sciences:

A. Study within the area of the major
BIO 141 General Genetics and 23 additional credits, which must include three credits in each of three of the following four areas:
Cell Biology and Biochemistry (BIO 154, 361)
Physiology and Development (BIO 201, 351, 354, 381)
Organisms (BIO 142, 143, 240, 303, 304)
Ecology and Evolution (BIO 152, 372, 387)
(The division encourages most students to take at least one course in all four areas.)

Elective courses for group A are chosen by the student, in consultation with an adviser, from any biology major courses, or approved courses in related areas. (The Biology Office and advisers maintain a list of such approved courses; others will be considered by petition, *prior* to registration.)

Study within the area of the major must include two *different* biology major courses with laboratory, or biology major courses. A BIO 298, 299 Research Project counts as one laboratory experience, regardless of credits or semesters.

Notes on Group A

1. Non-major courses (BIO 101, 102, 103, 104, 107, 111, 113) and teacher preparation courses (BIO 199, 200, 300, 301 and 350) do not satisfy group A requirements.
2. No more than a total of 8 credits from BIO 298, 299 and ISP 200 (Independent Study Program) may apply to group A requirements.
3. Transfer students must take at least 12 of the 26 group A credits and at least one of the two laboratory experiences within the Division of Biological Sciences at Stony Brook.

4. Students who entered Stony Brook prior to the 1973-74 academic year who wish to meet the requirements listed in the catalog of their year of entrance may substitute BIO 141 for BIO 150.

B. Courses required in related fields

CHE 101, 102 or 103, 104 Introductory Chemistry
CHE 105, 106 or 109, 110 Introductory Chemistry Laboratory
CHE 201, 202 or 211, 212 Organic Chemistry
CHE 203 or 207 Organic Chemistry Laboratory
PHY 131, 132 or 101, 102 Introductory Physics
(Note: Students planning to take additional chemistry courses such as CHE 153, 154 should note course requirements in advance and should choose PHY 101, 102.)
MSM 121 Calculus I and MSM 123 Calculus II and Probability; *or* MSM 121, 122 Calculus I, II and MSA 104 Introduction to Probability; *or* MSM 121 Calculus I and MSA 110 Introduction to Mathematical Modeling

C. Selection of electives

1. The curriculum for biological sciences majors is designed to allow a maximum degree of flexibility for students to plan programs best suited to their individual interests and goals. To take maximum advantage of this flexibility, and to prepare properly for desired postcollege careers, students are strongly urged to consult their advisers or other appropriate members of the division faculty before making final course selections.
2. 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.
3. Students preparing for secondary school teaching should note the new general requirements for provisional New York certification and for certification in science teaching.
4. Students with an interest in molecular or cellular biology are advised to include at least CHE 153 in their program.

D. Changes in program

With the adviser's consent, a student may petition the undergraduate studies committee in biological sciences for permission to change requirements of the major.

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 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 division to act as sponsor. The student, with the approval of the sponsor, must submit a research proposal in writing to the division.

Acceptance into the honors program is contingent upon approval of the proposal by the division.

Honors students must be enrolled in BIO 298, 299 Research Project.

Three copies of the completed thesis or report must be submitted to the sponsor not 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 division.

Conferral of honors is contingent upon the recommendation of a reading committee consisting of the sponsor, another member of the division and an outside reader. In addition, the student must maintain a grade point average of not less than 3.4 in all biological sciences and related courses taken in the senior year.

Students planning a program of independent study, which is generally for work outside the major, must have their proposal approved by their sponsor(s) and the provost before submission to the college curriculum committee.

In those cases where an independent study program involves a study in the biological sciences, no more than eight credits of independent study and/or research project (BIO 298, 299) may be used toward biological sciences degree requirements.

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, EDU 204, BIO 200, BIO 300, BIO 301, BIO 350. These courses are in addition to those required of biology majors.

COURSES IN THE BIOLOGICAL SCIENCES

BIO 101, 102 Biology: a Humanities Approach

The major concepts of biology are presented from historical, contemporary and criticial 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.

Fall and Spring, 3 credits each semester

E. Carlson and staff

BIO 103 Seminar in Biology and Values

Seminar on biology and values using reading list of books and articles on social, historical and controversial topics such as abortion, evolution, race, intelligence, pollution, radiation hazards, drugs, popuation and religion.
Prerequisite: BIO 101.

Fall, 2 credits. Not offered 1973-74.

E. Carlson

BIO 104 Laboratory in Biology for Non-Majors

A supervised, independent project laboratory in biology. Activities include laboratory or field work or special creative projects. Projects may be carried out individually or in teams.
Prerequisite: BIO 101.

Spring, 2 credits

E. Carlson

BIO 107 Laboratory in General Biology

Laboratory course in general biology which will explore a wide spectrum of biological phenomena including morphology, genetics, physiology and animal behavior. Course includes three hours of lab and one hour of discussion per week.
Prerequisite or corequisite: BIO 101 or 142.

Fall, 2 credits

D. Smith

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 discussions.

Fall, 3 credits

F. Erk

BIO 113 General Ecology

(Formerly BIO 155)

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 discussed. 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 gentics for biology majors. General areas to be discussed include transmission genetics, cytogenetics, immunogenetics, molecular genetics, population genetics and quantitative genetics.
Prerequisite or corequisite: CHE 101 or 103.

Fall, 3 credits

E. Katz

BIO 142 General Zoology

(Formerly BIO 171)

An extensive coverage of general zoology. The comparative embryology, morphology, physiology and ecology of animals will be studied. The last part of the course will be devoted to a consideration of animal genetics. Three hours of lecture per week. Open to majors and non-majors.
Prerequisite: A high school background in biology is required.

Fall, 3 credits

E. Battley

BIO 143 General Botany

(Formerly BIO 172)

An extensive coverage of general botany including the comparative embryology, morphology, physiology and ecology of plants. The last part of the course will be devoted to a consideration of plant genetics. Three hours of lecture per week. Open to majors and non-majors.
Prerequisite: A high school background in biology is required.

Spring, 3 credits

E. Battley

BIO 152 Adaptation and Evolution

Studies of adaptation in organisms, community dynamics, ecology and the theory of evolution.
Prerequisites: BIO 141; MSM 121.

Spring, 3 credits

J. Turner, L. Slobodkin

BIO 154 Cell Biology and Chemistry

(Formerly BIO 151)

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.
Prerequisite: CHE 102 or 104 and CHE 201 or 211.

Spring, 3 credits

V. Cirillo, 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.
Prerequisite: Six credits of biology or permission of instructor.

Fall, 3 credits. Not offered 1973-74.

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.
Prerequisite: BIO 141, 154.

Fall, 2 credits. Not offered 1973-74.

BIO 162 Cell Biology and Biochemistry Laboratory

A series of laboratory experiments and discussions designed to complement BIO 151. 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

Staff

BIO 199 Clinical Observation Experience

Observation of classroom activities in public 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: Six credits in biology.

Fall, 1 credit

R. Knott

BIO 200 Curricula in the Biological Sciences

Exhaustive analysis of all curricula used in the teaching of biology to secondary school students. Texts, manuals, audio-visual 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

R. Knott

BIO 201 General and Comparative Physiology

Problems of tissue and organ function are considered on the basis of the physiology of the cell. A review of certain fundamentals of cell physiology is followed by a consideration of certain specialized cells, their integration into tissues and organs and the contribution of these to coordinated physiological function in higher organisms. Three hours of lecture or discussion per week.
Prerequisite: BIO 154.
Prerequisite or corequisite: PHY 131 or PHY 101.

Fall, 3 credits
C. Moos

BIO 203 General and Comparative Physiology Laboratory

An analytical approach to selected topics presented in BIO 201, 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 201 or permission of instructor.

Spring, 2 credits
A. Carlson, B. Tunik

BIO 240 Parasitology

An introduction to the study of parasitism with special reference to human and experimental animal hosts. The ecology, physiology and pathogenesis, treatment, control and relation of parasites to worldwide health problems are considered. Three hours of lecture or discussion per week.
Prerequisite: BIO 154 or permission of instructor.

Fall, 3 credits
V. Farris

BIO 242 Parasitology Laboratory

Laboratory study of experimental animal hosts in which living materials are emphasized. One three-hour laboratory per week.
Corequisite: BIO 240.

Fall, 1 credit
V. Farris

BIO 250 Animal Embryology

A survey of the developmental anatomy of animals, especially vertebrates. Laboratory experience includes the analysis of embryonic anatomy from sections and whole embryos. Living embryos will be studied depending on seasonal availability. Lectures and readings cover the evolutionary significance of many developmental sequences as well as experimental analysis of developmental processes. Two hours of lectures or discussions and one three-hour laboratory period per week.
Prerequisite: BIO 142 or permission of instructor.

Fall, 3 credits
J. Fowler

BIO 293, 294 Special Topics from the Biological Literature

Tutorial reading in the biological sciences.
Prerequisite: Open to biology majors with the consent of the staff member who will supervise the work. The student *must* also have permission of the division.

Fall and Spring, 1 credit each semester
Staff

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 and Spring, 2 to 4 credits each semester
Staff

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
R. Knott

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 certificated biology teachers in one school each regular school day for the entire semester. Frequent consultations with the University faculty member 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
Staff

BIO 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. Three hours of lectures or discussions per week.
Prerequisite: BIO 201.

Spring, 3 credits
W. van der Kloot

BIO 303 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 142 or ESS 106 or permission of instructor.

Fall, 4 credits
G. Hechtel

BIO 304 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 142 or permission of instructor.

Spring, 4 credits
Staff

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. Nonparametric 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 math options.

Fall, 3 credits
J. Farris

BIO 306 Marine Invertebrates

The natural history, functional and comparative morphology, classification and phylogeny of selected marine invertebrates, with an emphasis on benthic groups.
Prerequisite: BIO 303 or permission of instructor.

Summer, 4 credits
G. Hechtel

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.

Spring, 2 credits
F. Erk

BIO 312 Population Genetics

A survey of mathematical methods, models and theory in population genetics together with a review of biological implications of the theory. Three hours of lectures or discussions per week.
Prerequisites: BIO 141, 152, and completion of divisional mathematics requirements.

Spring, 3 credits
J. Rohlf

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, 154.

Fall, 3 credits
M. Riley

BIO 320 Physiology and Biochemistry of Microorganisms

Discussion of the physiology and biochemistry of microbial processes, such as nitrogen and hydrogen fixation, sulfur metabolism, photosynthesis, cell wall synthesis, membrane functions, motility and physiological adaptation. Three hours of lectures or discussions per week.
Prerequisites: BIO 201, CHE 201.

Spring, 3 credits
V. Cirillo

BIO 321 Biology of Microorganisms

An introduction to the study of microorganisms by consideration of the taxonomy, development, structure, physiology, reproduction and ecology. Three hours of lectures or discussions per week.
Prerequisites: BIO 154 and CHE 202 or 212 or permission of instructor.

Spring, 3 credits
Staff

BIO 331 Oceanography for Biologists

Introduction to physical and chemical aspects of the marine environment.
Prerequisite: BIO 303 or 304.
Corequisite: BIO 334 or BIO 338.

Spring, 1 credit. Not offered 1973-74.

BIO 333 Control of Insect Populations

A lecture course designed to outline the concepts of modern integrated control of insect populations, with emphasis given to the impact of chemical insecticides on ecosystems.

Prerequisite: BIO 152.

Fall, 1 credit. Not offered 1973-74.

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 304.

Prerequisite or corequisite: BIO 331.

Spring, 2 credits. Not offered 1973-74.

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 303.
Prerequisite or corequisite: BIO 331.

Spring, 2 credits. Not offered 1973-74.

BIO 340 Marine Biology Laboratory

Work in the field and laboratory will emphasize quantitative sampling of populations and standard oceanographic techniques in the collection of data. Six hours of laboratory and field work on Saturdays. This course is identical with MAR 512 but is open to qualified undergraduates. BIO 303, 304, or 305 is recommended.

Prerequisite: Completion of divisional mathematics requirement.

Spring, 2 credits. Not offered 1973-74.

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

Staff

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 and CHE 201 or 211.

Fall, 4 credits

A. Krikorian

BIO 354 Principles of Development

An historical and experimental approach to an understanding of the development of concepts and processes involved in developing and differentiating systems. Although both prokaryotic and eukaryotic systems will be discussed, emphasis will be placed on the development of eukaryotes.
Prerequisite: BIO 154.

Spring, 3 credits

E. Katz, H. Lyman

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 lectures or discussions per week.
Prerequisites: CHE 201, 202.

Fall, 4 credits

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; is also covered. Four hours of lectures or discussions a week.
Prerequisite: BIO 361.

Spring, 4 credits

R. Sternglanz

BIO 372 Evolution

A detailed discussion of the mechanisms of evolution, focussing 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 (or permission of instructor).

Spring, 3 credits

D. Futuyma

BIO 381 Principles of Neurophysiology

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 201 or permission of instructor.

Fall, 3 credits

A. Carlson

BIO 382 Principles of Behavior

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 201.

Spring, 3 credits. Not offered 1973-74.

BIO 383 Evolution and Behavior

Ethology and the ecology and genetics of behavior. Emphasis will be placed on natural selection as a causative factor of

behavioral response. A basic understanding of Mendelian genetics and at least freshman college mathematics is recommended.

Prerequisite: BIO 382.

Fall, 3 credits. Not offered 1973-74.

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 (photo-periodism); breakdown of circadian organization; possible molecular mechanisms of the clock. Three hours per week of lecture, discussion, and reports.
Prerequisites: BIO 141, 154 and CHE 202 or 212; a basic knowledge of plant and animal physiology is highly recommended.

Spring, 3 credits

L. Edmunds

BIO 385 Comparative Neuroethology

The analysis of animal behavior, primarily dealing with invertebrates, from physiological point of view with emphasis on neurophysiological mechanisms. An examination of the integration of sensory and motor systems that produce behavior.
Prerequisites: BIO 201, BIO 381 and/or permission of instructor.

Spring, 2 credits. Not offered 1973-74.

BIO 387 Ecology

(Formerly BIO 386)

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 154 and completion of divisional mathematics requirement.

Fall, 3 credits

D. Futuyma

BIO 389 Ecology Laboratory

(Formerly BIO 388)

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 or permission of instructor.

Spring, 2 credits

M. Freundlich

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: Junior status as biology major or permission of instructor.

Fall, 2 credits

R. Merriam

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.
Prerequisites: Junior status as a biology major and permission of division.

Fall and Spring, 2 credits each semester

Staff

INTERDISCIPLINARY PROGRAM IN BLACK STUDIES

Assistant Professors: BETHUNE, BLACKMAN *(Chairman)*, WALKER, WASSWAS

Instructor: PARRIS

Lecturer: GANT

The Black 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 influence 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 Black Studies

In addition to the general university requirements for the Bachelor of Arts degree, majors in the black studies program must complete the following:

A. Required Courses

	Credits
BLS 100 The Black Experience in Transatlantic Perspectives	3
BLS 102 Socio-Cultural Features as Expressions of the Afro-American Experience	3
BLS 104, 105 Elementary Kiswahili I, II	6
BLS 230 Pan-African Literature	3
BLS 251 Education of the Afro-American in America	3
BLS 255 The Politics of Race	3
BLS 256 History of West Africa	3
BLS 399 Research in Black Studies	3

B. Elective Courses

Three additional BLS courses chosen in consultation with the student's major adviser	9
Total:	36

Special Information on Courses

1. Appropriate choices to satisfy the general university requirement in the arts and humanities are the following courses: BLS 100, 101, 190, 191, 211, 230, 231, 257, 260, 279.

2. Appropriate choices to satisfy the general university requirement in the social and behavioral sciences are the following courses: BLS 102, 200, 201, 239, 240, 241, 255, 256, 258, 259, 261, 262, 263, 270, 271, 272, 273, 274, 275, 280, 290, 301.

3. BLS 299 Readings in Black Studies and BLS 399 Research in Black Studies will be appropriate choices to satisfy the requirement in the arts and humanities *or* in the social and behavioral sciences, depending on their specific content.

COURSES IN BLACK STUDIES

BLS 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 peoples in Africa, the Caribbean and America, with particular emphasis on the United States. This course is required of all potential black studies majors.

Fall and Spring, 3 credits each semester

D. Blackman

BLS 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

L. Bethune

BLS 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 supplements class work.

Fall and Spring, 3 credits each semester

E. Wasswas

BLS 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: BLS 105.

Fall and Spring, 3 credits each semester. Not offered 1973-74.

BLS 200, 201 American Attitudes Toward 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 BLS courses.

Fall and Spring, 3 credits each semester.

L. Gant

BLS 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: BLS 100, 101 and/or 102.

Fall, 3 credits

E. Wasswas

BLS 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 sig-

nificance of these themes; it will involve intensive consideration of selected literary works of African and Afro-American expression.
Prerequisites: Two semesters of BLS courses chosen from BLS 100, 101, 259.

Fall and Spring, 3 credits each semester
L. Gant

BLS 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 sources.
Prerequisites: Junior or senior standing and permission of instructor.

Fall, 3 credits
L. Bethune

BLS 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. BLS 240 is identical with POL 205.
Prerequisites: Two semesters of introductory BLS courses.

Fall and Spring, 3 credits each semester
E. Wasswas

BLS 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. M. Walker

BLS 253 Lecture Series in Black 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
Staff

BLS 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. BLS 255 is identical wth POL 240.
Prerequisite: Two previous courses in the social sciences or sophomore standing.

Fall and Spring, 3 credits
C. Parris

BLS 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

BLS 257 Music in the Society of Sub-Saharan Africa

A survey of the role and function of music among the peoples of sub-Saharan Africa. Discussion will include traditional music in the so-called "tribal" society, and contemporary trends in African music-making as affected by such external influences as Islam, Christianity, urbanization, mass communications and other aspects of western civilization. BLS 257 is identical with MUS 110.

Fall, 3 credits. Not offered 1973-74.

BLS 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

BLS 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 education and political socialization among Afro-Americans in urban areas.
Prerequisites: Two courses in the social sciences or BLS 102 or permission of the instructor.

Spring, 3 credits

L. Bethune

BLS 260 African Music: Its Theory and Practice

The course will introduce students to the music of the peoples of sub-Saharan Africa through an analysis of its special characteristics of form, rhythm, melody and scales, harmony, instrumentation and performance techniques. This course is identical with MUS 391.
Prerequisite: MUS 122 or permission of instructor.

Spring, 3 credits. Not offered 1973-74.

BLS 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

L. Bethune

BLS 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

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

Fall and Spring, 3 credits

C. Parris

BLS 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 black studies and permission of instructor.

Fall and Spring, 3 credits each semester

D. Blackman

BLS 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 BLS courses and/or two semesters chosen from BLS 230, 231, 255.

Fall and Spring, 3 credits each semester
D. Blackman

BLS 274, 275 Political Psychology and Social Pathogenesis

A research-oriented seminar focusing on the psycho-dynamics of obedience, social control, racism, power and powerlessness, and genocide. After a firm grounding in analytical frameworks for investigating these contemporary and historical political phenomena, the seminar will emphasize their application to the pathologies of everyday life. Students will be required to submit original research designs in order to test specific hypotheses which emerge from seminar discussion.
Prerequisites: Two semesters of introductory BLS courses and permission of instructor.

Fall and Spring, 3 credits each semester
Staff

BLS 279 Seminar in Classical Islamic Cosmology

A critical examination of classical Islamic cosmology with a focus on the evolution of political thought. The seminar will investigate the validity of the classical Islamic world view for many of the problems of contemporary technocratic society.
Prerequisites: Two semesters of introductory courses in philosophy, religious studies or political thought, or permission of instructor.

Spring, 3 credits
Staff

BLS 280 Political Education, Social Stability and Ecopolitical Change

An analytical investigation of political, social, institutional stability and social change.
Prerequisites: Two semesters of upper level courses in the social sciences.

Fall and Spring, 3 credits
Staff

BLS 290 Legal Process and Social Structure

A critical evaluation of the administration of justice, legal institutions and the legal process in relation to prevailing social structure.
Prerequisite: Two semesters of introductory courses in the social sciences.

Fall and Spring, 3 credits
Staff

BLS 299 Readings in Black Studies

Prerequisite: Permission of department.

Variable 1 to 3 credits
Staff

BLS 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
D. Blackman

BLS 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: BLS 102 and BLS 259.

Fall and Spring, 3 credits
A. M. Walker

BLS 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: BLS 240 or 258 or 274 or 275.

Fall and Spring, 3 credits

E. Wasswas

BLS 399 Research in Black Studies

Prerequisite: Permission of department.

Variable 1 to 3 credits

Staff

DEPARTMENT OF CHEMISTRY

Professors: ALEXANDER, BONNER, CHU, FRIEDMAN, HAIM, HIROTA, KOSOWER *(Adjunct)*, LAUTERBUR, LE NOBLE, OKAYA, PORTER, RAMIREZ, SUJISHI *(Chairman)*

Associate Professors: L. ALTMAN, GOLDFARB, KERBER, SCHNEIDER, WEISER, WHITTEN, WISHNIA

Assistant Professors: F. FOWLER, D. HANSON, HONG *(Visiting)*, JESAITIS, P. JOHNSON, KRANTZ, LLOYD, MUROV, S. SCHWARTZ, SPRINGER, STIEFEL

Lecturer: MC DANIEL

Director of Chemical Laboratories and Lecturer: FUNKHOUSER

Coordinator of General Chemistry Laboratories and Lecturer: HAGEN

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.

All students who major in chemistry are urged to take at least 30 credits in the general areas of humanities and social sciences.

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 I, II
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, 122, 151, 152 Calculus I, II, III, IV (formerly MAT 102, 103, 155, 156). The sequence MSM 191-194 may be substituted (formerly MAT 193-196 sequence).

2. Three semesters of physics (commonly 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 Physical Chemistry I
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 (formerly MAT 102, 103, 155). The sequence MSM 191-193 may be substituted (formerly MAT 193-195 sequence).
2. Three semesters of physics (commonly PHY 101, 102, 151).

Preparation for Teachers of Chemistry in Secondary Schools

Curricula leading to provisional certification in chemistry for secondary school teachers are pending approval and 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 exam 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 IN CHEMISTRY

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

CHE 091, 092 Developmental Course in Chemistry

This course seeks to develop the skills, methods and procedures required for effective participation in subsequent departmental courses. Admission by permission of the chairman of the Department of Chemistry.

Fall and Spring, no credit

CHE 101, 102 Introductory Chemistry B

The principal topics covered are: Stoichiometry, the states of matter, chemical equilibrium, electrochemistry, thermodynamics, chemical kinetics, electronic structure, the chemical bond, periodic properties and selected topics in descriptive chemistry. The courses emphasize basic concepts, problem-solving and factual material, and consequently serve a dual purpose. For the students who will take additional chemistry courses (e.g., chemistry, biology, and pre-medical students), the CHE 101, 102 sequence provides the necessary foundation. For students who do not intend to take additional chemistry courses, the sequence provides a general, albeit elementary, view of many of the basic physico-chemical principles as well as significant aspects of organic, inorganic and biological chemistry. It is assumed that the student enrolled in CHE 101 has taken a high school chemistry course and has some familiarity with the following subjects: names and formulas of common elements and ions; elementary knowledge of fundamental particles and atomic structure; balancing of simple chemical equations; elementary stoichiometric relationships.

It is recommended that MSM 121 and 122 be taken concurrently with CHE 101 and 102, respectively. Three lecture hours and one discussion hour per week.
Corequisite to CHE 101: CHE 105.
Prerequisites to CHE 102: CHE 101 and CHE 105.
Corequisite to CHE 102: CHE 106.

Fall (101) *and Spring* (102), *4 credits each semester*

CHE 103, 104 Introductory Chemistry A

An introductory chemistry course, similar to CHE 101, 102 but requiring a stronger background in mathematics and physics, for those who may major in chemistry or another physical science. In addition to the background required for CHE 101, 102, a course of high school physics is assumed, and it is recommended that PHY 101, 102 be taken concurrently with CHE 103, 104. Three lecture hours and one discussion hour per week.
Corequisites to CHE 103: CHE 109, MSM 121.
Prerequisites to CHE 104: CHE 103, 109, MSM 121.
Corequisites to CHE 104: CHE 110, MSM 122.

Fall (103) *and Spring* (104), *4 credits each semester*

S. Sujishi

CHE 105, 106 Introductory Chemistry Laboratory B

Laboratory experiments designed to fulfill the following goals: 1) Illustration of principles presented in CHE 101, 102; 2) introduction to some of the methods of quantitative chemistry; 3) development of proper and precise laboratory techniques; 4) training in scientific methodology: experimental observations, recording of results, processing of experimental data, interpretation of results. Four hours of laboratory and discussion per week.
Corequisite to CHE 105: CHE 101.
Prerequisite to CHE 106: CHE 105.
Corequisite to CHE 106: CHE 102.

Fall (105) *and Spring* (106), *1 credit each semester*

Staff

CHE 109, 110 Introductory Chemistry Laboratory A

Laboratory experiments designed to illustrate the principles presented in CHE 103, 104 and with objectives similar to those in CHE 105, 106. Four 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*

P. Lauterbur

CHE 122 Concepts in Chemistry

Provides a basic knowledge of the concepts of bonding and reactivity that underlie modern inorganic and organic chemistry. Where possible, illustrations of these concepts are made with examples of chemical systems that relate to the environment and to plant and animal physiology. This course satisfies the chemistry requirement for students in the health sciences and is recommended to other students who desire more than a cursory knowledge of chemistry. A high school background in chemistry is helpful, but not required. Three lecture hours per week.

Spring, 3 credits

Staff

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

B. Chu

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 conductivity and electrochemistry; introduction to molecular theories of chemical kinetics. Three lecture hours per week.
Perequisite: CHE 153.
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

D. Lloyd

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 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: One year of college chemistry or permission of instructor.

Fall, 3 credits

R. Schneider

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: One year of college chemistry or permission of instructor.

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*

L. Altman

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 those planning careers in research.
Corequisites: CHE 201, 202 or 211, 212.
Prerequisite to CHE 204: CHE 203.

Fall (203) *and Spring* (204), *2 credits each semester*

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

D. McDaniel

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 201, 202. Three lecture hours per week.
Prerequisite to CHE 211: CHE 153 or permission of instructor.
Prerequisite to CHE 212: CHE 211.

Fall (211) *and Spring* (212), *3 credits each semester*

R. Jesaitis

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

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. Three 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, MSM 151.
Corequisite: PHY 151 or 141.

Fall, 3 credits

P. Johnson

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 understanding of rate laws and mechanisms. Three lecture hours per week.
Prerequisites: CHE 154, 255, MSM 152.

Spring, 3 credits. Not offered 1973-74.

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

S. Schwartz

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 203 or 207 and 255.
Corequisite: CHE 202 or 212.

Spring, 3 credits

CHE 306 Inorganic Chemistry II

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

Fall, 3 credits

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, 3 credits

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, 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 the department.

Fall and Spring, 1 to 3 credits each semester
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

COURSES IN CHINESE

Assistant Professor: S. M. Hu

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 or permission of instructor.

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 or permission of instructor.

Fall and Spring, 3 credits each semester

COURSES IN CLASSICS AND CLASSICAL LANGUAGES

Professor: HATHORN

Assistant Professor: GODFREY

An undergraduate degree program in classics is being developed for the near future. Pending completion of arrangements, the courses described below are being offered in classics (CLS) and in Latin and Greek. The classics courses and the language courses beyond the first year may be used to meet the general university requirement in arts and humanities.

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. This course is identical with CLT 101.

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. Not offered 1973-74.

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 credits. Not offered 1973-74.

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. Not offered 1973-74.

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 carefully 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.
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 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

INTERDISCIPLINARY PROGRAM IN COMPARATIVE LITERATURE

Program Chairman: R. Miller

Associate Professor: A. White

Faculty Advisory Committee:
English—Miller, Simpson, Weisinger
Foreign Languages and Literatures—Hathorn *(Classics)*, Karst *(Modern European Languages and Literatures)*
Philosophy—Buchler, Heelan
Physical Sciences—Eisenbud *(Physics)*
Social Sciences—Angress *(History)*, L. Coser *(Sociology)*
International Education—DeBoer

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. Sample foreign-language reading examinations are available in the Office of the Program.

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:

	Credits
A. CLT 110, 111 Masterpieces of World Literature	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 201 Topics in Literary Periods
CLT 202 Topics in Themes of Literature
CLT 203 Topics in Literary Traditions
CLT 204 Topics in Literary Genres
CLT 205 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 230 Political and Social Contexts

CLT 231 Intellectual Contexts

CLT 232 Cultural Contexts

G. Practica in Comparative Literature

CLT 275 Major Authors	3
CLT 290 Senior Seminar	3
CLT 299 Readings in Comparative Literature	3
Total	48

Additional Matters Pertaining to the Major

A. Each semester the program chairman will announce before preregistration 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 Old French, 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 IN COMPARATIVE LITERATURE

CLT 110, 111 Masterpieces of World Literature

A survey in translation of the major authors and works of western culture, excluding English and American. 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—Oriental, Indian, African.

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.
Prerequisites: CLT 110, 111.

3 credits

CLT 201 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.
Prerequisites: Two courses chosen from CLT 110, 111, 115, 120.

Fall and Spring, 3 credits

CLT 202 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.
Prerequisites: Two courses chosen from CLT 110, 111, 115, 120.

Fall and Spring, 3 credits

CLT 203 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.
Prerequisites: Two courses chosen from CLT 110, 111, 115, 120.

Fall and Spring, 3 credits

CLT 204 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.
Prerequisites: Two courses chosen from CLT 110, 111, 115, 120.

Fall and Spring, 3 credits

CLT 205 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.
Prerequisites: Two courses chosen from CLT 110, 111, 115, 120.

Fall and Spring, 3 credits

CLT 230 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.
Prerequisites: Two courses chosen from CLT 110, 111, 115, 120.

Fall and Spring, 3 credits

CLT 231 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.
Prerequisites: Two courses chosen from CLT 110, 111, 115, 120.

Fall and Spring, 3 credits

CLT 232 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.
Prerequisites: Two courses chosen from CLT 110, 111, 115, 120.

Fall and Spring, 3 credits

CLT 275 Major Authors

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. Authors will vary.
Prerequisite: Completion of the required courses in the Analytic Modes and Interdisciplinary Modes sequences.

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 the instructor and of the program chairman.

3 credits

CLT 299 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 the program chairman.

Fall and Spring, 3 credits

DEPARTMENT OF EARTH AND SPACE SCIENCES

Professors: CARTER, DODD, LINDSLEY, OWEN, A. PALMER, PAPIKE *(Chairman)*, PREWITT, SCHAEFFER

Associate Professors: BENCE, BRETSKY, G. HANSON, HARDORP, SHU, M. SIMON

Assistant Professors: FLESSA, GOLDSMITH, HÄNNY, KNACKE, LEVINTON, PETERSON, WEIDNER

Lecturer and Curator: 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 adviser assigned by the department.

Students are prepared primarily for graduate studies in astronomy, astrophysics, 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 in Earth and Space Sciences

The department offers B.S. degree programs in each of the following areas: astronomy, solid earth studies, environmental paleobiology and marine sciences. Specific recommended course sequences can be obtained from the departmental office.

In addition to the general university requirements for the Bachelor of Science degree, the following are the minimum required for the major in earth and space sciences:

A. Study within the area of the major

   Twenty-seven credits of courses in the Department of Earth and Space Sciences, of which at least nine credits are numbered 300 or higher. Of these 27 credits, 12 credits may be substituted from chemistry or physics courses numbered 201 or above.

B. Courses in related fields

   Twenty-seven credits of courses in biology, chemistry, engineering, physics or mathematics, of which at least four courses of three or more credits are concentrated in either biology, chemistry, engineering or physics, or in mathematics courses beyond first year calculus. At least one year each of chemistry, physics and mathematics is a minimum requirement. (These credits are in addition to any credits substituted for earth and space science courses under requirement A.)

C. All courses to meet the above requirements must be taken for letter grade.

Requirements for the B.A. Degree in Earth and Space Sciences

The department offers a B.A. program for those students who plan to use a broad, strong undergraduate science background in postcollege fields such as teaching, journalism, science administration, library work or law.

In addition to the general university requirements for the Bachelor of Arts degree, the following are the minimum required for the major in earth and space sciences:

A. Study within the area of the major

   At least 28 credits of courses in the ESS department including a

minimum of one course from each sub-area below and no more than a total of four 100-level lecture courses.

1. Astronomy
   ESS 101 General Astronomy
   ESS 203 Astronomy
   ESS 248 Intelligent Life in the Universe

2. Earth Sciences
   ESS 102 The Earth and the Moon (with ESS 112 Physical Geology Laboratory)
   ESS 106 The Ages Before Man (with ESS 116 Historical Geology Laboratory)
   ESS 201 Mineralogy
   ESS 202 Environmental Geology
   ESS 211 Life and Time

3. Marine Sciences
   ESS 104 Oceanography
   ESS 325 Marine Geochemistry
   ESS 364 Marine Geology

B. Courses in related fields
   One year of study in three of the following: mathematics, chemistry, physics or biology.

C. All courses to meet the above requirements must be taken for letter grade.

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 following courses: ESS 102/112, 104, 106/116, 201, 203, 211, 239, 240, and 306, in either the B.A. or B.S. sequences, and who have at least a 2.5 grade point average at the end of their junior year can be admitted to student teaching.

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 *earth sciences* must include in their programs the following academic courses: ESS 102/112, 106/116, 201, 211, 301, 306, 307, 309, 312, 363. Candidates for honors in *astronomy* must include a sequence of mathematics, physics and earth and space sciences courses approved by the student's adviser 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 stu-

dent's adviser 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 IN EARTH AND SPACE SCIENCES

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 General Astronomy

The dynamic development of astronomy is traced to help elucidate the nature of modern science and the meaning of scientific discovery. Emphasis is placed on discoveries which have profoundly influenced man's outlook concerning the nature of the physical world and man's place in the universe. Three one-hour lectures and one one-hour recitation per week. Intended primarily for students with little or no science background. An optional observing session will be held one evening per week.

Fall, 4 credits
D. Goldsmith

ESS 102 The Earth and the Moon

The exciting achievements of the Apollo missions now permit comparisons of the physical and chemical processes operating at the surface of and within two planetary bodies in our solar system: our earth and her satellite, the moon. Topics to be considered include surface weathering, volcanism, sedimentation, mountain building, and such controversial subjects as sea-floor spreading, continental drift, and the origin of the earth-moon system. Three one-hour lectures per week and four one-hour recitation sessions per semester.

Fall, 3 credits
N. Carter

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 biochemistry 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
Staff

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 lands 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
Staff

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
Staff

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
Staff

Intermediate Courses for Undergraduates

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, or permission of instructor.

Fall, 4 credits
J. Papike

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. 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 121 or PHY 131.

Fall, 4 credits
R. Knacke

ESS 211 Life and Time

Principles and methods in the study of the history of life. The origin of life, premetazoan 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.
Corequisite: For ESS majors in environmental paleobiology B.S. sequence: BIO 303.

Fall, 3 credits
K. Flessa

ESS 239 Materials and Methods in the Teaching of Earth and Space 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 and junior or senior standing.

Fall, 3 credits

S. Englebright

ESS 240 Observational Methods and Curriculum Development in Earth Science Education

Sequel to ESS 239, with emphasis placed on recent secondary school curricula, and development of technical aids (i.e., displays, audio-visual 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 sessions in elementary, junior and senior high school classrooms.
Prerequisites: ESS 239 and permission of instructor.

Spring, 3 credits

S. Englebright

ESS 242, 244 Astronomy: The Observational Approach I, II

A survey of the observed properties of stars, the galaxy and galaxies. The emphasis is on the use of physical principles to interpret the observations. Topics will include: the structure of the atmospheres and interiors of stars, evolution of stars, physics of the interstellar medium, and the kinematics, dynamics and evolution of galaxies. Two one and one-half hour lectures per week plus extensive independent exercises.
Corequisites: PHY 151, MSM 151 (Fall); PHY 152, MSM 152 (Spring).

Fall and Spring, 4 credits each semester

Staff

ESS 245 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 244.

Spring, 1 credit

Staff

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 requirement in natural sciences.

Spring, 3 credits

Staff

Courses for Advanced Undergraduates

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

D. Lindsley

ESS 305 Field Geology

A field course which may be taken at any one of several approved university field stations.

Variable credit

Staff

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

R. Dodd

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

R. Dodd

ESS 308 Advanced Topics in Geology

Discussions of major problems of interest in geology. Two one-hour lectures per week and field trips.
Prerequisite: ESS 309 or equivalent.

Spring, 3 credits and repetitive

Staff

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

R. Hänny

ESS 312 Stratigraphy

Problems of correlation, facies analysis, graphic representation, stratigraphic nomenclature and paleogeography are analysed using the geology of western United States as a framework. In the last third of the semester, students prepare either written or oral critical reviews of selected modern stratigraphic studies in terms of the principles learned earlier in the semester. Two one-and-one-half hour lectures per week and one weekend field trip.
Prerequisite: ESS 363.

Spring, 3 credits

A. Palmer

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.
Prerequisite: BIO 303.

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 153.

Fall, 3 credits

O. Schaeffer

ESS 326 Mineral Equilibria

After a brief introduction, carbonate systems, oxidation potential and *p*H relations, complex ions and applications to

geological processes are discussed. Two one-hour lectures and one four-hour laboratory per week.
Prerequisite: CHE 153.

Spring, 3 credits

O. Schaeffer

ESS 328 Instrumental Methods in Geochemistry

A course of study to familiarize students with the methods used in studying geochemical systems. Students work alone or in pairs, under the close supervision of a faculty member, on a project chosen by the student and the faculty member. Projects will include fission tracks, gamma counting, alpha counting, rare gas mass spectrometry, marine chemistry with ion electrodes and X-ray fluorescence.
Prerequisites: CHE 154 and permission of instructor.
Corequisite: ESS 326.

Spring, 3 credits

O. Schaeffer

ESS 331 X-ray Mineralogy

Principles of symmetry, single-crystal X-ray diffraction techniques and elements of crystal structure determination. Use of crystallographic data in the study of mineral systems. Laboratory in diffraction techniques includes extensive use of digital computers. Two one-hour lectures and one three-hour laboratory per week.
Prerequisite: ESS 201.

Fall, 3 credits

C. Prewitt

ESS 332 Crystal Chemistry

The application of crystallographic techniques to problems in mineral chemistry. Concepts of the crystalline state, order-disorder, atom radii, chemical bonding, atom coordination, solid solutions and physical properties of minerals. Emphasis on silicate and sulfide crystal structures. Two lectures and one three-hour laboratory per week.
Prerequisite: ESS 331.

Spring, 3 credits

C. Prewitt

ESS 343, 344 Laboratory Courses in Astronomical Techniques I, II

A number of laboratory experiments designed to illustrate modern astronomical techniques and to familiarize the student with the use of telescopes and the electronic instrumentation attached to astronomical telescopes. A survey of the methods of observational measurement and the reduction of data. Two four-hour laboratories per week.
Prerequisite: ESS 242.

Fall and Spring, 4 credits each semester

Staff

ESS 347 Solar System Astrophysics

The motions of the planets, comets and asteroids, planetary atmosphere, the surface of the moon and the planets as well as the origin of the solar system are considered. Three one-hour lectures per week.
Prerequisites: MSM 152, PHY 152.

Fall, 3 credits

T. Owen

ESS 350 Global Tectonics

The displacement of continents in time and space; mechanisms of sea floor spreading; origin of first order structures on continents and in ocean basins.
Prerequisite: ESS 309.

Spring, 3 credits

N. Carter, R. Hänny

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 Sediments and Sedimentary Processes

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
Staff

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 lectures and one three-hour laboratory per week.
Prerequisites: ESS 102, 104.

Spring, 3 credits
G. Hanson

ESS 381 Astrophysical Processes I

Introduction to transport processes of astrophysical importance; the conditions of thermal equilibrium for gases and radiation; the kinetic theory of gases and the theory of radiative transfer. Discussion of diffusion, convection, turbulence and waves in neutral and ionized gases. Theory of thermal and non-thermal emission of electromagnetic radiation. Application of the theory to a variety of astronomical problems. Two one-and-one-half hour lectures per week. This course is identical with PHY 381.
Prerequisites: PHY 152 and 206.

Fall, 3 credits
M. Simon

ESS 382 Astrophysical Processes II

Introduction to high-energy processes occurring in the interstellar medium and stellar interiors. The origin of cosmic rays, the mechanism of synchrotron radiation, thermonuclear reactions and neutrino processes. Application to the study of highly evolved stars, supernovae remnants, radio galaxies and quasars. Two one-and-one-half-hour lectures per week. This course is identical with PHY 382.
Prerequisite: ESS 381.

Spring, 3 credits
M. Simon

ESS 383 Physics of the Interstellar Medium

Determination of temperature, density and composition of the interstellar medium; interstellar absorption and the physics of interstellar grains; star formation; radio observations of the interstellar gas; the intergalactic medium; in particular, H 11 regions, planetary nebulae and globules will be discussed. Three one-hour lectures per week. This course is identical with PHY 383.
Prerequisite: ESS 381.

Spring, 3 credits
Staff

ESS 384 Galactic Structure

Introduction to the kinematics and dynamics of the interstellar medium and of stellar systems. The interaction between stars and the interstellar medium: the problems of star formation, mass ejection, radiative ionization and insterstellar turbulence. The coupling of the interstellar medium with magnetic fields. Galactic rotation and the large-scale structure of our own galaxy as deduced from radio surveys of the emission and absorption of the 21 cm. hydrogen line. The dynamics of star clusters and galaxies. Application to the study of the distribution of stars in velocities and in space and to the study of the large-scale structure of regular galaxies. Three one-hour lectures per week. This course is identical with PHY 384.
Prerequisite: PHY 205.

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.
Prerequisite: Permission of the department.

Fall and Spring, 1 to 3 credits, repetitive
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.
Prerequisite: Permission of the chairman of the Department of Earth and Space Sciences.

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: E. AMES *(Chairman),* HOFFMANN, JAMES, KALMAN, NEUBERGER, STEKLER

Associate Professors: DUSANSKY, ENTINE *(Adjunct),* KANOVSKY, KRISTEIN, MIRMAN, STALEY, VAN ROY, ZSCHOCK, ZWEIG

Assistant Professors: SATTINGER, SCHOEPFLE, WICHERS, WILE

Lecturer: DAWES

The undergradute program in economics provides opportunities for exploring many elements of the processes of production, exchange, and distribution of goods and services.

After taking one of the introductory courses, ECO 100, 103, or 122, which present some of the basic problems of economics, 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. Some courses are presented in mathematical terms, but a mathematical background is not required to complete an undergraduate major.

In each broad category of study the department offers one course in "Topics," which will be offered as student demand and faculty time and interest coincide. In any semester there might be one or more sections of a particular "Topics" course offered, each section being a substantively different course. *Each "Topics" course may be taken repeatedly by any student as long as a different substantive section is taken each time.* Students should check with department faculty for information about sections to be offered in any particular semester or consult course listings in the time schedule during registration.

Any student who wishes to do independent study may find a department faculty member to sponsor and help shape his or her work in ECO 393 and 394 which may be taken repeatedly.

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 there are a number of economics courses which 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 total of 30 credit hours in courses in economics, consisting of not more than eight credit hours of 100-level courses and including:
>
> ECO 100 Introduction to Economics *or* ECO 103 Economic Problems of the Environment *or* ECO 122 Economics of Socialism
>
> ECO 211 or 215 Intermediate Microeconomic Theory
> ECO 212 or 216 Intermediate Macroeconomic Theory

Majors may substitute up to six credit hours earned from MSA 250, 316 and 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 recommended to take statistics, although this is not a requirement for the major.

Exemption Program

To achieve the ends of an enriched and accelerated curriculum for those students who are ready for such advance, the department has established the following procedure:

1. Any student may be exempt from any required economics course by taking an examination in which he or she receives a grade of at least B.

2. The application for such exemption examinations should be filed with the department coordinator one month before the end of the semester; and upon approval of the application, the student will normally take the final examination with all the other members of the class taking that particular course, or if special circumstances require, will be given a special examination, at the discretion of the department. Only in exceptional circumstances will a student be permitted to take an exemption examination for any particular course more than once.

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 100 (or ECO 103 or 122), and 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 IN ECONOMICS

ECO 100 Introduction to Economics

Exposure to some of the important problems and social institutions which are studied in economics. Topics include: property relations; economic and social class; the functioning of markets and price and production decisions; problems of unemployment and inflation; technology.

Fall and Spring, 4 credits

Staff

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.

Fall, 4 credits

H. Stekler

ECO 114 Economic Accounting

Introduction to some formal accounting statements commonly involved in economic 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

Staff

ECO 122 Economics of Socialism

(Formerly ECO 214)

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: ECO 100 or 103 or 122 or permission of instructor.

Fall, 3 credits

A. Entine

ECO 203 History of Economic Thought

(Formerly ECO 311)

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: ECO 100 or 103 or 122 or permission of instructor.

Fall, 3 credits. Not offered 1973-74.

ECO 210 International Economics

Economic theory of international trade, protection, commercial policy, customs unions, capital movements and international finance.
Prerequisite: ECO 100 or 103 or 122 or permission of instructor.

Fall, 3 credits

C. Staley

ECO 211 Intermediate Microeconomic Theory

Economic theory of cost, demand, price and markets. The application of theory to familiar problems is emphasized.
Prerequisite: ECO 100 or 103 or 122 or permission of instructor.

Fall and Spring, 4 credits

Staff

ECO 212 Intermediate Macroeconomic Theory

The theory of national income determination, employment, distribution, price levels and growth.
Prerequisite: ECO 100 or 103 or 122 or permission of instructor.

Fall and Spring, 4 credits

Staff

ECO 215 Intermediate Mathematical Microeconomic Theory

Same as ECO 211 but developed in mathematical terms.
Prerequisites: ECO 100 or 103 or 122; MSM 122 or 123; or permission of instructor.

Fall, 4 credits

Staff

ECO 216 Intermediate Mathematical Macroeconomic Theory

Same as ECO 212 but developed in mathematical terms.
Prerequisites: ECO 100 or 103 or 122; MSM 122 or 123; or permission of instructor.

Spring, 4 credits

Staff

ECO 220 Introduction to Economic Statistics

(Formerly ECO 111)

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.

Fall, 4 credits

W. Dawes

ECO 221 Introduction to Econometrics

(Formerly ECO 112)

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: languages of economics; logic of theories, concrete interpretation, logical structure of explanatory economic hypotheses; elementary theory of quantity and measurement, empirical basis of measurement in economics.
Prerequisite: ECO 100 or 103 or 122 or permission of instructor.

Fall, 3 credits

W. Dawes

ECO 225 Economic Development

(Formerly ECO 325)

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: ECO 100 or 103 or 122 or permission of instructor.

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 or permission of instructor.

Fall, 3 credits

D. Nienhaus

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: ECO 100 or 103 or 122 or permission of instructor.

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: ECO 100 or 103 or 122 or permission of instructor.

Fall, 3 credits. Not offered 1973-74.

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: ECO 100 or 103 or 122 or permission of instructor.

Spring, 3 credits

D. Zschock

ECO 241 Political Economy of the United States

(Formerly ECO 341)

An analysis of the structure of capitalism as an economic system and the relations between the economy and socio-political institutions. The method of dialectical and historical materialism is developed and applied to class structure, education, alienation, imperialism, the role of the state in capitalism and other issues of contemporary American society.
Prerequisite: ECO 100 or 103 or 122 or permission of instructor.

Fall, 3credits. Not offered 1973-74.

ECO 243 Comparative Economic Systems

(Formerly ECO 343)

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: ECO 100 or 103 or 122 or permission of instructor.

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: ECO 100 or 103 or 122 or permission of instructor.

Spring, 3 credits

J. Wile

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: ECO 100 or 103 or 122 or permission of instructor.

3 credits, course repeatable for different sections

Staff

ECO 300 Monetary Theory and Policy

The influence of the quantity of money in the economic systems and 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, or permission of instructor.

Spring, 3 credits. Not offered 1973-74.

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 or permission of instructor.

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 or permission of instructor.

Spring, 3 credits

Staff

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 permission of instructor.

Fall, 3 credits

Staff

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 or permission of instructor.

Spring, 3 credits. Not offered 1973-74.

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, or permission of instructor.

Spring, 3 credits

C. Staley

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 or permission of instructor.

Fall, 3 credits

H. Stekler

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.
Prerequisites: ECO 100 or 103 or 122; MSM 122 or 123; or permission of instructor.

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: ECO 100 or 103 or 122 or permission of instructor.

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.
Prerequisites: MSM 152 and 201.

Fall, 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 or permission of instructor.

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 or permission of instructor.

Fall, 3 credits
Staff

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 situations 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 or permission of instructor.

Spring, 3 credits
Staff

ECO 351 Programming and Economic Models

A study of linear and non-linear programming models, presenting some major topics in economic theory and their conclusions in programming terms. Topics include production and cost theory, input-output, activity analysis and game-theoretic models.
Prerequisites: ECO 211 or 215 and MSM 151.

Fall, 4 credits. Not offered 1973-74.

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 or permission of instructor.

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 or permission of instructor.

Fall and Spring, 3 credits each semester
Staff

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.
Prerequisite: MSM 151 or some knowledge of linear algebra.

Fall, 3 credits. Not offered 1973-74.

ECO 380 Topics in Economic 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 deter-

mination; 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
Staff

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
Staff

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
Staff

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
Staff

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
Staff

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.
Prerequisite: Permission of department.

Credit variable, course repeatable
Staff

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 100 or 103 or 122; 211 or 215; and 212 or 216.

Spring, 3 credits
Staff

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

Staff

DEPARTMENT OF EDUCATION

Professors: CARTON, L. GARDNER, HALASZ *(Part-time)*, KELMAN, KREUTER, PETERS, SEIFMAN, STOLUROW *(Chairman)*

Associate Professors: BIRNS, D. COOK, M. GOLDEN, HEDLEY, LEVENSTEIN *(Adjunct)*, A. LIPTON

Assistant Professors: A. BASKIN, B. BASKIN, BESS *(Adjunct)*, BREDDERMAN, BRENNAN, M. FISHER, M. F. GOLDBERG, HARRISON, MASLINOFF, MCMULLEN, J. PHILLIPS *(Adjunct)*, T. ROTH *(Adjunct)*, F. SILVER, L. STEPHENS, TIEGEL, WALKER

Lecturers: ANNACONE, BLOOM, FARAND, FUSCO, GLASS, KAPLAN, KLEINMAN, KUEHNS, LESSER, LICHT, D. LICHTENSTEIN, LIPSET, LYNCH, MORRIS, MYERS, A. RAY, J. SCHIFFER, R. SCHUMANN, G. SMITH, STRASSBERG, TAUB

The Department of Education offers two distinct types of courses: First, courses providing the opportunity to study education as a field of inquiry. Such courses address themselves to principles and issues in the field of education—the entire process by which a culture attempts to transmit itself across the generations. Second, courses providing "professional study in education." Such courses are designed for students enrolled in the University's Teacher Certification Programs.

COURSES IN EDUCATION

EDU 102 Social and Technical Foundations of Education

A survey of contemporary educational methods and problems, emphasizing the development of individualized methods of instruction and their application in actual educational systems. Case studies in the application of such methods in decentralized education, urban education, open admissions programs, mass media programs and education in developing countries.

Fall, 3 credits

D. Cook

EDU 103 Human Development

An examination of the factors affecting human growth and development from conception through the life cycle. Different theoretical approaches, research findings and their implications for schools and teaching will be emphasized. May not be taken for credit after PSY 211.

Fall and Spring, 3 credits

B. Birns, M. Golden

EDU 150 Children's Literature

An interpretive and critical study of literature for children in elementary grades.

Fall and Spring, 3 credits

L. Farrand

EDU 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. This course is identical with HIS 160.

Fall and Spring, 3 credits

B. Baskin

EDU 201 Psychological Foundations of Education

The course consists of a study of principles of psychology as they apply to elementary school education. Topics include measurement and evaluation, aptitude and "readiness," cognition, problem solving, retention and transfer, motivation, and socialization.

Fall and Spring, 3 credits

R. Bloom

EDU 204 Adolescent Growth and Development

This course is designed to give the students insight into the children soon to be their pupils. It will deal with traditional as well as contemporary issues in adolescent development. Biological, intellectual and cultural aspects of adolescence will be dealt with. Special attention will be given to the youth culture, adolescence in the ghetto, alienation, drugs, sex and dropping out.

Prerequisite: Junior or senior standing.

Fall and Spring, 3 credits

I. Tiegel

EDU 250 Social Issues in American Education

Selected current social issues affecting education will be analyzed by using a theoretical framework of alienation. The issues to be considered will include school integration, school dropouts, "cultural deprivation," etc.

Fall and Spring, 3 credits

E. Hedley

EDU 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 on social, economic, political and psychological factors which have conditioned educational opportunities for Afro-American citizens and the present crisis in America. This course is identical with BLS 251.

Prerequisite: Permission of instructor.

Fall and Spring, 3 credits

A. Walker

EDU 299 Independent Reading in Education

Individually supervised reading in the field of education under the guidance of a faculty member. Approval of the instructor must be secured before registering.

Prerequisite: Permission of department.

Fall and Spring, 1 to 3 credits

Staff

EDU 301 Laboratory in Evaluating Elementary Classroom Behavior

Practice in using and interpreting observations and standard objective tests for the classroom teacher pre-kindergarten through primary grades: diagnosis of learning disabilities; derivation of appropriate form and content of referral reports to psychologists, physicians, counselors, administrators and other adjunct professionals. Practice in identifying cognitive, affective and physical handicaps in children of several hypothetical classes. Limitations of a "theoretical" methodology.
Prerequisite or corequisite: EDU 371 or EDU 373.

Fall and Spring, 3 credits

M. Fisher

EDU 325 The Teaching of Social Studies in the Elementary School

This course reviews the social studies content in the elementary school and will help the prospective teacher to develop skills in locating and developing resource materials and in identifying personal criteria for planning lessons. The course also covers strategies in group processes, the process approach to social studies and the evaluation of students. Observation and participation in selected schools, 2-3 hours per week.
Prerequisite: Junior or senior standing.

Fall and Spring, 3 credits

L. Maslinoff

EDU 329 Educational Psycholinguistics

An examination of the psychology of language; the relations among language, 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 interrelationship between cognitive development and linguistic development will be reviewed. (Small scale original research will be required of graduate students and may be substituted for the mid-term examination by undergraduates.) This course is identical with LIN 329.
Prerequisite: Permission of instructor.

Fall and Spring, 3 credits

A. Carton

EDU 330 The Teaching of Mathematics and Science in the Elementary School

A laboratory course in which the student will work with modern mathematics and science curriculum materials that are currently in use in elementary schools. During the semester the student will select his work from a variety of options including laboratory and seminar sessions, school observations, readings, field trips, lesson planning, writing, projects and teaching children. Observation and participation in selected schools, two to three hours per week.
Prerequisite: Permission of instructor.

Fall and Spring, 3 credits

T. Bredderman, M. Morris

EDU 331 Instructional Programming I

An introductory presentation of the concepts, considerations and procedures involved in the preparation of instructional materials for mediation by an interactive computer. The retrieval and analysis of student data will also be examined, particularly as these affect the design of materials and of instructional experiments. This course is intended to prepare persons who are planning for, or will work with, an instructional computer. Elementary concepts of data processing and programming will be part of a course-within-a-course, from which the discussion of instructional strategies and paradigms will emerge.
Prerequisite: Permission of instructor.

Fall and Spring, 3 credits

E. Lambe

EDU 333 Curriculum Models in Pre-School Education

Major educational models of pre-school education will be surveyed. Curricular models developed for experimental-research programs will be covered as well

as traditional pre-school models. Emphasis will be on the teaching methods and materials of each model as they are associated with the cognitive, sensory-motor, language, and affective development of young children. In a weekly, four-hour laboratory, students will observe and participate in several different pre-school programs (e.g., a home-teaching intervention program, a Montessori program, a pre-kindergarten program, a day care center, a cooperative pre-school, etc.). Emphasis of the laboratory will be on learning about various curricular models (methods/materials) through observation and participation.
Prerequisites: EDU 103, 201, and permission of instructor.

Fall and Spring, 4 credits

M. Golden, D. Lichtenstein

EDU 335 Evaluation and Measurement in the Schools

An examination of the basic principles and concepts underlying educational measurement as they apply to practice in the schools. Experience will be provided in the preparation of informal classroom tests in a variety of content fields, in the development and use of non-test evaluation techniques and procedures, and in the use and interpretation of common standardized achievement tests.
Prerequisite: Permission of instructor.

Fall and Spring, 3 credits

F. Peters

EDU 345, 346 Philosophy of Education

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 PHI 345, 346.
Prerequisite: Junior standing.

Fall and Spring, 3 credits each semester

L. Gardner, E. Hedley

EDU 350 Supervised Secondary School Student Teaching*

Prospective secondary school teachers receive supervised practice in teaching their subjects by arrangement with selected Long Island junior and senior high schools. The student teacher reports to the school to which he is assigned for the full school day for the semester. Frequent consultation with the supervising teacher and seminar meetings with a University faculty member, help the students to interpret and evaluate 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: Senior standing and approval of the department chairman.
Corequisite: EDU 354.

Fall and Spring, 12 credits

Staff

EDU 351 Introduction to Instructional Methods and Materials in the Elementary School

An intensive study of instructional methods and materials related to curricular areas in the elementary school: reading, mathematics, language arts, social studies, science and the fine arts. Multi-media techniques will stress the use of films, television, transparencies, slides, film strips and recordings. Classroom management, lesson planning, school organization and interrelationships among teachers, students, parents and administrators will be included. Students will participate in classroom observations, trial teaching,

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* Student teaching assignments are made on the basis of the school system's availability and University program needs. Students entering this program are advised that transportation and in some cases housing away from campus, during the student teaching period, are student responsibilities and plans should be made accordingly. No student teaching assignments are available during the summer session.

micro-teaching, workshops, field trips and demonstration lessons. Course registration is restricted to students planning to enroll in EDU 352. Observation and participation in selected schools, two to three hours per week.
Prerequisites: Junior standing and approval of the department chairman.

Fall and Spring, 3 credits
Staff

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 evaluate 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: Senior standing and approval of the department chairman.
Corequisite: EDU 355.

Fall and Spring, 12 credits
Staff

EDU 354 Student Teaching Seminar (Secondary Education)

Seminar on problems and issues of teaching at the secondary school level. Analysis of actual problems and issues encountered by the student in his student teaching experience.
Corequisite: EDU 350.

Fall and Spring, 3 credits
Staff

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
Staff

EDU 364 The Teaching of Reading

This course is designed to familiarize future elementary and secondary school teachers with the methods and materials necessary to teach reading in today's schools. Moreover, ideas and developments which reflect the changing nature of reading instruction and materials for tomorrow's schools will also be explored in depth. Particularly stressed will be the relationship between the child and his language development as it involves the reading process; critical reading skills; reading and its relationship to the thinking process; and methods which consider cultural, personality and psycholinguistic diversity in children. The process of reading will be evaluated in the context of school system, child and community. Observation and participation in selected schools, two to three hours per week.
Prerequisite: Permission of instructor.

Fall and Spring, 3 credits
Staff

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

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* Student teaching assignments are made on the basis of the school system's availability and University program needs. Students entering this program are advised that tranportation and in some cases housing away from campus, during the student teaching period, are student responsibilities and plans should be made accordingly. No student teaching assignments are available during the summer session.

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

Staff

EDU 371 Educational Implications of Sex Role Typing in Childhood and Adolescence

The development of male-female roles in contemporary American society will be discussed developmentally from birth through adolescence. Although the emphasis will be on social, psychological, and educational factors, cross-cultural biological and maturational factors will also be considered. Issues such as differential maternal behavior in infancy and early childhood, differential rates of maturation and learning, teachers' contributions to sex role typing, and the effects of mass media will be discussed.
Prerequisites: EDU 103 or PSY 211 and permission of instructor.

Fall, 3 credits

B. Birns

EDU 373 Implications of Poverty and Racism on Child Development

This course will examine the literature on the biological, psychological and societal contributions to the development of inadequate school readiness and performance of a sizeable minority of America's children. The nature-nurture controvery, the culture of poverty and the problem of middle-class bias will be discussed. Potentials for change in teachers' behavior for maximization of student potentials will be stressed. An attempt will be made to clarify the relationship between social class and ethnicity.
Prerequisites: EDU 103 or PSY 211 and permission of instructor.

Spring, 3 credits

B. Birns

EDU 375 Social Studies Curriculum Development: Seminar-Laboratory

An analysis of selected theoretical constructs for social studies curriculum development and their application to the design of new curriculum materials. Special emphasis given to the design, analysis and evaluation of curriculum materials developed by the student and experimented with in actual teaching experiences.
Prerequisite: Permission of instructor.

Fall and Spring, 4 credits

E. Seifman and staff

EDU 397 Teaching Social Studies

A study of social studies as a subject taught in the secondary schools: the nature of the social studies; curricula models; scope and sequence of topics offered; new programs of social studies instruction, etc. Designed for prospective teachers of social studies in secondary schools.
Prerequisite: A minimum of five social science courses beyond the introductory level.

Fall, 3 credits

E. Seifman

EDU 398 Social Studies Teaching Strategies

An examination of the instructional methods and materials for teaching social studies at the secondary school level. Designed for prospective teachers of social studies in secondary schools.
Prerequisite: A minimum of five social science courses beyond the introductory level.

Spring, 3 credits

Staff

EDU 399 Independent Research in Education

Individually supervised research in the field of education. The student prepares a program of work in consultation with the instructor, meets with the instructor at regular intervals throughout the semester and presents evidence of his accomplishment at the end of the semester. Approval of the instructor must be secured before registering.
Prerequisites: Senior standing and permission of department.

Fall and Spring, 1 to 3 credits

Staff

INTERDISCIPLINARY PROGRAM IN ELEMENTARY EDUCATION

This interdisciplinary program offers students an opportunity to prepare for a career in elementary school teaching.

In response to the need for elementary school teachers with a broad academic background, the program combines a balanced variety of liberal studies, courses in educational theory and practice, and field experience in teaching.

The requirements for the elementary education major (EED) are:

	Credits
I. Liberal Studies	
(Courses taken to satisfy these requirements may also be used to meet appropriate general university requirements.)	
A. Natural Sciences	
1. One semester course in the biological sciences (BIO 101, 102, 111, 113 or equivalent.)	3
2. One semester course in the physical sciences, i.e., chemistry, earth and space sciences, and physics (PHY 121 or CHE 122 are recommended.)	3-4
3. Two semester courses in mathematics (MSA 101, MSM 111, 112 or equivalent.)	6
B. Social Sciences	
Four semester courses chosen from anthropology, economics, history, political science, psychology and/or sociology	12
C. Arts and Humanities	
Four semester courses chosen from art, classics, English (except EGL 101), foreign languages, music, philosophy and/or theatre arts	12
D. Linguistics	
One semester course chosen from LIN 102, LIN 105 (EGL 282), LIN 211 (EGL 280), LIN/EDU 329	3
	39-40

	Credits
II. Professional Study in Education	
A. Foundations of Educational Theory and Practice	
1. EDU 102 Social Foundations of Education	3
2. EDU 103 Human Development	3
B. Teaching Skills and Competencies in Elementary School Teaching	
1. EDU 330 The Teaching of Mathematics and Science in the Elementary School	3
2. EDU 351 Introduction to Instructional Methods and Materials in the Elementary School	3
3. EDU 364 The Teaching of Reading ..... (Note: The above three courses should be taken, whenever possible, as a nine credit sequence, the semester (s) before student teaching.)	3
4. EDU 335 Evaluation and Measurement in the Schools	3
C. Field Experience in Teaching	
1. EDU 352 Supervised Elementary School Student Teaching	12
2. EDU 355 Student Teaching Seminar (Elementary Education)	3
3. EDU 365 Workshop in Teaching Reading for Elementary School Teachers ..... (Note: The above three courses must be taken during the same semester as an 18-credit sequence.)	3
	36
III. Electives	
Students are urged to acquire a thorough knowledge of at least one academic field in the liberal arts and sciences, with a minimum of 18 credits in each field above the introductory level. Education courses may be taken to meet this requirement	45
Total	120

At the present time, the EED program outlined above is undergoing study by the university teacher preparation committee, which will publish its recommendations during the academic year. The institution is currently considering plans for a five-year program leading to permanent certification at the elementary level. Details concerning the establish-

ment of this program and policies of admission to practice teaching in the program will be announced separately. Questions about the EED major program should be directed to the Department of Education as early as the second semester of the freshman year to allow for wise selection of courses.

Students interested in education primarily as a field for graduate study, i.e., experimental work and research rather than teaching, are advised to consult the Department of Education for help in choosing suitable undergraduate courses.

DEPARTMENT OF ENGLISH

Distinguished Professor: KAZIN

Professors: ALTIZER, DICKSON, [c]ERDMAN, H. GOLDBERG, KRANIDAS, [a]LEVIN, LUDWIG, R. MILLER, L. SIMPSON, STAMPFER, STEVENS, J. THOMPSON, WEISINGER

Associate Professors: ABRAMS, [c]J. BENNETT, [b]P. DOLAN, FIESS, FRY, R. A. LEVINE, T. MARESCA, NELSON, NEUMEYER, [a]PEQUIGNEY, ROGERS, SEARS, [b]SHAW, WILSON, ZIMBARDO

Assistant Professors: ANSHEN, AWOONOR, BAKER, BASHFORD, CARPENTER, DIBBLE, FORTUNA, HALL, HARVEY, HUFFMAN, NEWLIN, SCHREIBER

Instructor: RAND

Lecturers: CAMPBELL, COLLINS, GATTEN, SPECTOR

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:

	Credits
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

[a] On leave academic year 1973-74.
[b] On leave fall semester 1973.
[c] On leave spring semester 1974.

4. Eight additional English courses distributed as follows:

   a. Four courses from the sequence numbered EGL 200-222, with at least one of the courses in American Literature, EGL 216-222 12

   b. One course from the sequence numbered EGL 240-259, exclusive of EGL 241 Shakespeare 3

   c. One course from the sequence numbered EGL 260-279 3

   d. EGL 281 History and Structure of the English Language 3

   e. One additional course elected from those offerings numbered EGL 200-299 3

   36

5. One year (or its five-credit equivalent) of college study of a foreign language at the intermediate level or beyond.

6. One year (six credits) 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.

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.

COURSES IN ENGLISH

Most of the courses described below are offered every semester, unless otherwise indicated, but details of staffing and related information should be obtained from schedules published by the English Department before registration each semester. Reading lists are also available in advance.

Certain courses may be repeated 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 adviser before registering.

Special Courses for International Students

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 International Student Affairs Office.

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 International Student Affairs Office.

No credit toward academic requirements

S. Chanover

I. THE CRAFT OF WRITING

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 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

J. Gatten

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

K. Awoonor, J. Gatten

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

Staff

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

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

Staff

EGL 237 Literary Analysis and Argumentation

An introduction to the techniques and terminology of close literary analysis and argumentation as applied to poetry, fiction and drama; the course will include frequent writing assignments and is designed for students beginning their major study in English.

Prerequisite: EGL 101.

Fall and Spring, 3 credits

P. Newlin, R. Rand, T. Rogers, E. Schreiber

III. THE LITERARY TRADITION OF ENGLAND AND AMERICA

These courses are directed towards an understanding of the various periods of English and American literature. They include study of both major and minor authors with consideration of intellectual and social history, developments in theme and style, and other matters as described in the detailed course descriptions and reading lists provided for each course before registration.

For each course the prerequisite is sophomore standing or permission of instructor.

EGL 200 Old English Literature

The study of English literature from its beginnings to the Middle Ages.

Fall and Spring, 3 credits

D. Fry, E. Schreiber

EGL 202 Medieval Literature in English

The study of English literature from the end of the Old English period to the Renaissance.

Fall and Spring, 3 credits

E. Schreiber, S. Spector

EGL 204 Renaissance Literature in English

The study of English literature of the Renaissance.

Fall and Spring, 3 credits

A. Bergson, C. Huffman

EGL 206 English Literature of the 17th Century

The study of English literature from late Renaissance to the Age of Dryden.

Fall and Spring, 3 credits

T. Kranidas

EGL 208 The Age of Dryden

The study of the English literature of the Restoration period.

Spring, 3 credits

T. Maresca

EGL 210 Neo-Classical Literature in English

The study of English literature of the Neo-Classical period from the end of the Restoration period to the Romantic era.

Fall, 3 credits

T. Rogers

EGL 212 Romantic Literature in English

The study of English literature of the Romantic period from the end of the Neo-Classical period to the Victorian Age.

Fall and Spring, 3 credits

D. Erdman, R. Rand

EGL 214 Victorian Literature

The study of English literature of the Victorian Age from the end of the Romantic period to the beginning of the Modern Movement.

Fall and Spring, 3 credits

J. Bennett, R. Levine

EGL 216 American Colonial and Federal Writers

The study of American literature from its beginnings to the period of the New England Imagination.

Spring, 3 credits

P. Shaw

EGL 218 The New England Imagination

The study of American literature from the period of the American Colonial and Federal Writers to the era of the American Realists.

Fall and Spring, 3 credits

M. Baker, P. Newlin

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

M. Baker, D. Fortuna

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

H. Campbell, J. Gatten, G. Nelson

EGL 226 Contemporary English and American Literature

The study of English and American literature from World War II to the present.

Fall and Spring, 3 credits

H. Harvey, G. Nelson

EGL 237 Literary Analysis and Argumentation

(See Section II, Introduction to Literature, for description.)

EGL 238 Survey of British Literature

The study of British literature from the Old English period to Milton.

Fall, 3 credits

A. Bergson, T. Maresca, R. Rand, J. Thompson

EGL 239 Survey of British Literature

The study of British literature from Dryden to the present.

Spring, 3 credits

J. Dibble, P. Neumeyer, J. Thompson

IV. MAJOR AUTHORS

Intensive study in the works of one great writer. These courses in various individual figures are offered from time to time, as indicated by notices published by the department before each registration period. EGL 243 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 or permission of instructor.

EGL 240 Chaucer

Fall and Spring, 3 credits
E. Schreiber, R. Zimbardo

EGL 241 Shakespeare

Fall and Spring, 3 credits
A. Bergson, C. Huffman, T. Kranidas

EGL 242 Milton

Fall and Spring, 3 credits
T. Kranidas

EGL 243 Major Writers and Writings of Medieval Literature in English

Intensive study of selected major writers and/or writings of medieval literature in English.

3 credits
D. Fry, E. Schreiber, S. Spector

EGL 244 Major Writers of the Renaissance Period in England

Intensive study of a selected major writer of the Renaissance period in England.

3 credits
A. Bergson, J. Ludwig

EGL 245 Major Writers of the 17th Century in England

Intensive study of a selected major writer of the 17th century in England.

3 credits
T. Kranidas

EGL 246 Major Writers of the Restoration Period in England

Intensive study of a selected major writer of the Restoration period in England.

3 credits
W. Carpenter

EGL 247 Major Writers of the Neo-Classical Period in England

Intensive study of a selected major writer of the Neo-Classical period in England.

3 credits
T. Maresca, H. Goldberg

EGL 248 Major Writers of the Romantic Period in England

Intensive study of a selected major writer of the Romantic period in England.

3 credits
D. Erdman, R. Rand

EGL 249 Major Writers of the Victorian Period in England

Intensive study of a selected major writer of the Victorian period in England.

3 credits
J. Bennett, R. Levine

EGL 250 Major Writers of Earlier American Literature

Intensive study of a selected major writer from earlier American literature.

3 credits
E. Fiess, P. Newlin

EGL 251 Major Writers of Later American Literature

Intensive study of a selected major writer from later American literature.

3 credits
M. Baker, A. Kazin

EGL 252 Major Writers of Modern British and American Literature

Intensive study of a selected major writer from modern British and American literature.

3 credits

D. Fortuna, J. Ludwig

EGL 253 Major Writers of Contemporary British and American Literature

Intensive study of a selected major writer from contemporary British and American literature.

3 credits

S. Sears, A. Kazin

V. THE MODES AND FORMS OF LITERATURE

These courses provide special studies in regional literature, genres of literature and other topics. Detailed information on course content, staffing and scheduling is published by the English Department before registration each semester. Reading lists are also available in advance. EGL 262 through 268 and EGL 272 and 274 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 or permission of instructor.

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 selected readings from the Old and New Testaments.

Fall and Spring, 3 credits

D. Dickson, 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

A. Kazin, 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 and Spring, 3 credits

H. Campbell, H. 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

W. Carpenter, J. Dibble

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 270 History of Literary Criticism

Analytic survey of major texts in the history of European 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

H. Campbell, D. Fry

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

Staff

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, 3 credits

S. Sears

VI. LANGUAGE AND LINGUISTICS*

EGL 280 The English Language: Introduction to Syntax

An introduction to transformational-generative grammar. Special attention will be given to the grammar of English. This course is identical with LIN 211.

Fall and Spring, 3 credits

Staff

EGL 281 History and Structure of 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, M. Stevens

EGL 282 Nonstandard Varieties of English

Intended for students who plan to teach in the elementary and secondary schools, the course will investigate 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. This course is identical with LIN 105.

Fall and Spring, 3 credits

F. Anshen

VII. SPECIAL STUDIES IN ENGLISH

EGL 290 Methods of Instruction in Literature and Composition

Examination of the intellectual grounds of the teaching of literature and composition in secondary school and exploration of the problems involved in communicating literary values to high school students.

Fall and Spring, 3 credits

B. Bashford, P. Neumeyer

EGL 291 Senior Honors Seminar

Advanced intensive study of a special literary topic in preparation for the independent work of EGL 292. Admission to the course requires a major grade point average of at least 3.0 and permission of the department.

Fall, 3 credits

H. Goldberg

* For additional offerings in linguistics, see the section of this *Bulletin*, "Interdisciplinary Program in Linguistcs."

EGL 292 Senior Honors Seminar

Intensive inquiry and independent study culminating in an honors essay.
Prerequisite: EGL 291.

Spring, 3 credits
H. Goldberg

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
Staff

EGL 299 Independent Project

Intensive study of a special topic undertaken with close faculty supervision. Permission of instructor and director of undergraduate studies required.

Fall and Spring, 1 to 3 credits
Staff

INTERDISCIPLINARY PROGRAM IN ENVIRONMENTAL STUDIES

Program Chairman: COLLVER

Faculty Advisory Committee:
Biological Sciences—R. SMOLKER
Earth and Space Sciences—A. BENCE
Engineering—R. CHEVRAY
Philosophy—A. DE NICHOLAS
Political Science—L. KOPPELMAN
Psychology—L. KRASNER

The interdisciplinary program in environmental studies (ENS) is designed to provide students with a basic understanding of man's interdependence with his environment and to prepare them to take part as informed citizens in environmental planning. The program can serve as the basic preparation for students intending to pursue professional studies in any of a variety of fields dealing with problems of the environment. In addition to taking a core sequence of courses, each student will be expected to begin developing competence in a specialty and gain some practice in applying it to environmental problems as a member of an interdisciplinary team. Courses for the specialty need not be all in one department, as long as they comprise a coherent set. The specialty requirement may be satisfied by completing a regular departmental major with an emphasis on courses relevant to environmental studies.

Requirements for the Major

While fulfilling the general university requirements for the Bachelor of Arts degree, a student majoring in this program must complete the following courses:

Credits

I. Basic Concepts and Skills

Group A. Four of the following courses in three disciplines for a minimum of 12 credits 12

BIO 113 General Ecology (formerly BIO 155)
BIO 141 General Genetics
CHE 101/105, 102/106 *or* 103/109, 104/110 Introductory Chemistry
ESS 102 The Earth and the Moon (ESS 112 lab optional)
ESS 104 Oceanography
ESS 202 Environmental Geology
PHY 101, 102 or 131, 132 Introductory Physics
Note: A laboratory course such as CHE 105 or ESS 112 may not be counted as one of the four required courses.

Group B. Four of the following courses in three disciplines for a minimum of 12 credits 12

ECO 103 Economic Problems of the Environment (or ECO 100 Introduction to Economics)
ECO 211 Intermediate Microeconomic Theory
PHI 303 The Surrounding World: Philosophy and Environment
POL 191 Political Behavior
POL 200 Political Analysis
SOC 103 Introduction to Sociology
SOC 201 Research Methods in Sociology

Group C. Two courses in mathematics, applied mathematics, computer science or statistics, for a minimum of six credits 6

II. Specialty Requirement 12

A minimum of four courses beyond the introductory level in a specialty to be approved by the chairman of environmental studies.

III. Interdisciplinary Courses 11

ENS 201 Man and His Environment
ENS 251, 252 Environmental Studies Colloquium
ENS 391, 392 Senior Projects Seminar

COURSES IN ENVIRONMENTAL STUDIES

ENS 201 Man and His Environment

How population growth and technological change, under existing institutions, affect man's environment and its capacity to sustain human life. Studies of selected environmental problems. Examination of proposed policies for achieving a balance between man and the environment. ENS 201 may not be counted toward the general university requirement in natural science or social science.

Spring, 3 credits
Staff

ENS 251, 252 Colloquium in Environmental Studies

A weekly series of lectures and discussions dealing with the interdisciplinary approach to environmental problems and devoted to planning for senior year projects. Prerequisites: ENS 201 and junior standing.

Fall and Spring, 1 credit each semester
Staff

ENS 391, 392 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 actually concerned with the problems. Prerequisites: ENS 251, 252 *and* permission of chairman.

Fall and Spring, 3 credits each semester
Staff

ENS 399 Environmental Research

Individual or group study, with a faculty adviser, 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. No more than three credits may be taken concurrently with ENS 391, 392. Prerequisite: Permission of program chairman.

Fall and Spring, 3 credits
Staff

DEPARTMENT OF FRENCH AND ITALIAN

Professors: BIEBER, F. BROWN, BRUGMANS, HAAC, LAIDLAW, WHITNEY *(Chairman)*, ZIMMERMANN

Associate Professors: ALLENTUCH, MILLS, RIZZUTO, TURSI

Assistant Professors: BLUM, MIGNONE, PETREY, RIGGS

Instructors: BECKER, SCIABA

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 advisers 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 advisers.

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 adviser in doubtful cases. Note that no graduation credit is given 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:

	Credits
I. Required courses for a minimum total of 15 credits:	
A. Language courses	
FRN 221 Conversation and Composition	3
FRN 321 Phonetics and Diction	3
FRN 322 Stylistics	3
B. Literature courses	
FRN 295, 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 adviser. It is strongly recommended that the student select a diversified program	21
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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:

	Credits
I. Required courses for a minimum total of 12 credits:	
A. Language courses	
ITL 221 Conversation and Composition	3
ITL 321 Advanced Conversation and Composition I	3
B. Literature courses	
ITL 297, 298 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 adviser. It is strongly recommended hat the student select a diversified program 21

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Teacher Training Program

Students who wish to prepare for certification as secondary school teachers of French should consult appropriate departmental advisers concerning requirements and procedures for the teacher preparation program.

Students who wish to prepare for certification as secondary school teachers of Italian must take ITL 321, 322 Advanced Conversation and Composition. They must also take ITL 240 Curriculum Development as well as FLA 239 and six other credits in education. Before receiving permission to student teach, these students must take and pass, with a minimum score of 200, the MLA Proficiency Examination in Italian.

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, Malraux, Bernanos, Claudel, Sartre, Camus, Beckett, Genet, Sarraute, Robbe-Grillet. Each course may be taken independently of the other.

Fall and Spring, 3 credits each semester

E. Riggs and Staff

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 and Staff

COURSES IN FRENCH

FRN 111, 112 Elementary French

An introduction to spoken and written French, stressing pronunciation, speaking, comprehension, reading and writing.

Fall and Spring, 3 credits each semester

E. Riggs and Staff

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, 5 credits

S. Petrey and Staff

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

C. Blum and Staff

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, 5 credits

N. Becker and Staff

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

A. Rizzuto and Staff

FRN 221 Conversation and Composition

A course in the active use of spoken and written French. Language laboratory will supplement class work.
Prerequisite: FRN 195 or equivalent.

Fall and Spring, 3 credits

O. Haac and Staff

FRN 222 Introduction to Literary Analysis

Reading and discussion of selected authors designed to improve the comprehension of literary texts and to increase mastery of basic language skills. Recommended for students planning to spend their junior year abroad.
Prerequisite: FRN 192 or 195 or equivalent.

Spring, 3 credits

A. Rizzuto and Staff

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

A. Rizzuto and Staff

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. Whitney and Staff

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

C. Blum

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

M. Whitney and Staff

FRN 300 French Poetry

A study of the development of French poetry from the Pleiade to the 20th century. Poems will be analyzed and discussed from an historical and esthetic point of view.

Prerequisite: FRN 192 or 195 or equivalent.

Fall, 3 credits

M. Whitney and Staff

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.
Prerequisites: FRN 221, FRN 295, 296, or special permission.

Fall, 3 credits

L. Brugmans

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.
Prerequisites: FRN 221, FRN 295, 296, or special permission.

Spring, 3 credits

N. Becker

FRN 323 Advanced French Conversation

A course designed to develop and maintain complete fluency in the language.
Prerequisites: FRN 221, FRN 295, 296, or special permission.

Fall, 3 credits

N. Becker

Further Studies in French Literature

Prerequisites for the following courses: FRN 221, FRN 295, 296, or special permission.

Readings in the following courses will be in French. Discussions, too, will normally be in French. Each semester, however, one section may be specifically designated for non-majors. Discussions for the non-major section will be in English for assigned French texts.

FRN 333 Studies in 16th Century Literature

Fall, 3 credits

Staff

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, E. Zimmermann

FRN 351, 352 Studies in 18th Century Literature

Fall and Spring, 3 credits each semester

Staff

FRN 361, 362 Studies in 19th Century Literature

Fall and Spring, 3 credits each semester

S. Petrey, A. Rizzuto

FRN 373, 374 Studies in 20th Century Literature

Fall and Spring, 3 credits each semester

F. Brown and Staff

FRN 382 Literature of Commitment

Literature of commitment and the reaction against commitment in the 20th century.

Fall, 3 credits

K. Bieber

FRN 389 French Civilization

A history of French civilization with emphasis on contemporary France. The course is designed for students who plan to teach French in secondary schools.
Prerequisite: Permission of instructor.

Fall, 3 credits
K. Bieber

FRN 393, 394 Free Seminar

A detailed description of this seminar may be obtained from the department.
Prerequisite: Permission of department.

Fall and Spring, 3 credits each semester
Staff

FRN 399 Directed Readings in French

Individually supervised readings in selected topics of French language and literature.
Prerequisite: Permission of department.

Fall and Spring, 1 to 4 credits
Staff

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
A. Sciaba

ITL 115 Intensive Elementary Italian

An intensive course covering the elementary Italian program (ITL 111, 112) in one semester.

Fall and Spring, 5 credits
M. Mignone

ITL 191, 192 Intermediate Italian

An intermediate course in the reading and discussion of selected Italian texts. An intensive grammar review with practical language laboratory exercises will offer an opportunity to develop conversational ability.
Prerequisite: ITL 112 or 115 or equivalent.

Fall and Spring, 3 credits each semester
Staff

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, 5 credits
M. Mignone

ITL 221 Italian Conversation

A course in spoken Italian for advanced students. At least one hour of language laboratory is required.
Prerequisite: ITL 192 or 195 or permission of instructor.

Fall, 3 credits
Staff

ITL 222 Readings and Discussion of Modern Authors

Readings selected from the works of modern Italian authors, with explication of the texts and oral and written reports.
Prerequisite: ITL 221 or permission of instructor.

Spring, 3 credits
Staff

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 221.

Spring, 3 credits
Staff

ITL 297 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 or permission of instructor.

Fall, 3 credits
A. Sciaba

ITL 298 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 or permission of instructor.

Spring, 3 credits
A. Sciaba

ITL 301 Special Author

Tutorial or seminar format, devoted to one author such as: Lorenzo de Medici, Ariosto, Tasso, Machiavelli, Alfieri, Manzoni, Carducci and others. Essential works and significant criticism will be analysed.
Prerequisites: Senior standing, ITL 297, 298 and permission of adviser. ITL 301 may be taken only once.

Fall and Spring, 3 credits
Staff

ITL 305 Early Italian Lyric through Dante

A study of the origin, development and trends of early Italian lyric poetry, beginning with the Sicilian School, through the Dolce Stil Novo and Dante's poetry other than the *Divina Commedia*.
Prerequisites: ITL 297, 298 and permission of instructor.

Fall, 3 credits. Not offered 1973-74.

ITL 306 Petrarch and Boccaccio

Reading and discussion of the major works of Petrarch and Boccaccio, with special attention to the treatment of themes and mode of expression.
Prerequisites: ITL 297, 298.

Spring, 3 credits
Staff

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
Staff

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.
Prerequisites: ITL 221, 222 or equivalent.

Spring, 3 credits
Staff

ITL 324 History of the Italian Language

A survey of the development of the Italian language from its origin to the present day.

Spring, 3 credits
Staff

ITL 327 Dante's "Divina Commedia" I

Reading and interpretation of the *Inferno*, preceded by a study of the *Vita Nuova* as an introduction to the *Divina Commedia*.
Prerequisites: ITL 297, 298.

Fall, 3 credits
J. Tursi

ITL 328 Dante's "Divina Commedia" II

Reading and interpretation of the *Purgatorio* and the *Paradiso*.
Prerequisite: ITL 327.

Spring, 3 credits
J. Tursi

ITL 330 Humanism and Modern Man

The crisis of the Middle Ages in Italy: the growth of humanism, its revolutionary view of the role of the individual and so-

ciety, its influence on western values and attitudes, through a study of significant works of literature and art. The course will be offered in Italian.
Prerequisites: ITL 191, 192 or 195.

Fall and Spring, 3 credits
M. Mignone

ITL 332 Italian Literature of the Renaissance

The study of *Orlando Furioso* by Ariosto and the *Gerusalemme Liberata* by Tasso, together with selected works by Lorenzo de Medici, Poliziano, Machiavelli, Castiglione, Michelangelo and Bembo.
Prerequisites: ITL 297, 298.

Spring, 3 credits
M. Mignone

ITL 340 The Age of Reforms

The innovations of the 18th century—new modes of political action, the widening of the social basis of the middle class, the birth of a human model based on the philosopher and the merchant, the opening toward the life and manifestations of sentiment—as reflected in the themes, structures and language of selected works by Metastasio, Vico, Goldoni, Parini and Alfieri.
Prerequisites: ITL 297, 298.

Fall, 3 credits
M. Mignone

ITL 371, 372 Contemporary Italian Literature I, II

A study of contemporary Italian poetry, prose, and theatre. D'Annunzio, Marinetti, Ungaretti, Montale, Pirandello, De Filippo, Moravia and Silone are among the writers to be discussed and examined.
Prerequisites: ITL 297, 298 and permission of instructor.

Fall and Spring, 3 credits each semester
Staff

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.
Prerequisites: ITL 191, 192 or 195 or equivalent.

Fall, 3 credits
Staff

ITL 399 Directed Readings in Italian

Individually supervised readings in selected topics of Italian language and literature.
Prerequisites: Senior standing, ITL 297, 298, and permission of adviser. ITL 399 may be taken only once.

Fall and Spring, 1 to 4 credits
Staff

DEPARTMENT OF GERMANIC AND SLAVIC LANGUAGES AND LITERATURES

Professors: CZERWINSKI, GREEN *(Visiting)*, KARST, KOTT, SCHRÖTER, SJÖBERG

Associate Professors: BERR, R. BROWN, COCRON, RUPLIN, RUSSELL

Assistant Professors: ELLING, O'NEIL, RADLEY, VOGEL

Instructor: PRUSKA-MUNK

Requirements for the Major in Germanic and Slavic Languages and Literatures

In addition to the general university requirements for the Bachelor of Arts degree, the major in Germanic or Slavic languages and literatures

must complete the sequence GER 199-208 or RUS 199-208, for a total of 24 credits.

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; GER-RUS 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 211-230 or RUS 211-228 for those in the GER 205-208 or RUS 205-208 sequences.

Note: Students majoring in German language and literature may consider spending their junior or senior year at the University of Tuebingen, Germany, with the permission of the department.

Teacher Certification

Students wishing to prepare for certification as secondary school teachers in Germanic or Slavic languages should consult the appropriate departmental advisers. The department will urge them to take, in addition to the courses required for certification, GER 237 and GER 240, if appropriate; in addition, it will be urged that the future teacher take GER 209, 210 or RUS 209, 210.

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 adviser; 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 IN 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 two lab hours (one computer-assisted and one audio-passive).

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
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.

Fall and Spring, 3 credits each semester
D. O'Neil

GER 131-136 Offerings in Translation

(Formerly 231-236)
GER 131 German Masterworks; GER 132 German Novel; GER 133 Mann Brothers; GER 134 Hesse; GER 135 Post-War Literature: West Germany; GER 136 Post-War Literature: East Germany

Schedule to be announced, 3 credits each
Staff

GER 151, 152 Intermediate German I, II

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 audio-lingual skills.

Prerequisite: GER 112 or equivalent.

Fall and Spring, 3 credits each semester
Staff

GER 195 Intensive Intermediate German

An intensive course covering the intermediate German program (GER 151, 152) in one semester.

Prerequisite: GER 112 or 113 or equivalent.

Fall and Spring, 6 credits
Staff

GER 197, 198 German Conversation and Composition

This course consists of the active use of spoken and written German.

Prerequisite: GER 152 or 195 or permission of instructor.

Fall and Spring, 3 credits each semester
Staff

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
J. Russell 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 152 or 195 or permission of instructor.

Spring, 3 credits
S. Berr

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 152 or 195 or permission of instructor.

Fall, 3 credits
B. Elling

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 152 or 195 or equivalent.

Spring, 3 credits
B. Elling

GER 205, 206, 207 Genre Studies

Intensive study of specific genres and their sub-genres. All work will be done in German. GER 205 German Drama (Fall); GER 206 German Prose (Spring); GER 207 German Poetry (Fall).
Prerequisite: GER 204 or permission of instructor.

3 credits each

R. Brown, 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 or permission of instructor.

Spring, 3 credits

R. Karst

GER 209, 210 Advanced German Conversation and Composition

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 197, 198 or permission of instructor.

Fall and Spring, 3 credits each semester

Staff

GER 211-220 Special Author

Intensive study of specific authors. All work will be done in German. GER 211 Lessing; GER 212 Goethe; GER 213 Hölderlin; GER 214 Tieck and Hoffmann; GER 215 Minor 19th Century Authors; GER 216 Grillparzer and Hebbel; GER 217 Keller and Meyer; GER 218 Minor 20th Century Authors; GER 219 Kafka; GER 220 Brecht.
Prerequisite: GER 204 or permission of instructor.

Schedule to be announced, 3 credits each

Staff

GER 221-230 Special Period

Intensive study of specific periods. All work will be done in German. GER 221 Medieval Literature; GER 222 Reformation; GER 223 Barock; GER 224 Aufklärung; GER 225 Sturm and Drang; GER 226 Klassik; GER 227 Romantik; GER 228 Realismus; GER 229 Naturalismus; GER 230 Expressionismus.
Prerequisite: GER 204 or permission of instructor.

Schedule to be announced, 3 credits each

Staff

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 197, 198 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

COURSES IN 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

Staff

COURSES IN SCANDINAVIAN LANGUAGES AND LITERATURES

SWE 111, 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

B. Lipman-Wulf

SWE 131, 132 Offerings in Translation

(Formerly SWE 231, 232)

SWE 131 Scandinavian Masterworks (Fall); SWE 132 Scandinavian Novel (Spring).

3 credits each semester

L. Sjöberg

SWE 151, 152 Intermediate Swedish I, II

The reading and interpretation of Swedish texts, with a review of Swedish grammar, composition and conversation.
Prerequisite: SWE 112 or equivalent.

Fall and Spring, 3 credits each semester

L. Sjöberg

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

COURSES IN SLAVIC LANGUAGES AND LITERATURES

Courses in 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

M. Pruska—Munk

PSH 151, 152 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

M. Pruska—Munk

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 151, 152 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

Staff

EEL 197 Minor East European Language Conversation and Composition

This course consists of the active use of a spoken and written minor East European language. (This course may be repeated for more than one language.)
Prerequisite: EEL 152 or permission of instructor.

Fall, 3 credits

J. Kott

COURSES IN 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 113 Intensive Elementary Russian

An intensive course covering the elementary Russian program (RUS 111, 112) in one semester.

Fall, 6 credits

L. Vogel

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

Staff

RUS 131-136 Offerings in Translation

RUS 131 Russian Masterworks; RUS 132 Russian Novel; RUS 133 Tolstoy; RUS 134 Dostoevsky; RUS 135, 136 Comparative Slavic Literature I, II.

Schedule to be announced, 3 credits each

E. Czerwinski and Staff

RUS 151, 152 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

E. Czerwinski

RUS 195 Intensive Intermediate Russian

An intensive course covering the intermediate Russian program (RUS 151, 152) in one semester.
Prerequisite: RUS 112 or equivalent.

Spring, 6 credits
Staff

RUS 197, 198 Russian Conversation and Composition

This course consists of the active use of spoken and written Russian.
Prerequisite: RUS 152 or RUS 195 or permission of instructor.

Fall and Spring, 3 credits each semester
L. Vogel

RUS 199 Slavic Civilization and Culture

An introduction to the customs, history, arts, culture and linguistic history of the Slavic speaking areas. The course, offered in English, is team taught by members of the department. Guest speakers from other departments and from outside will be invited to participate.

Fall, 3 credits
F. Cocron

RUS 202 History of the Russian Language

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 151 or permission of instructor.

Spring, 3 credits
F. Cocron

RUS 203 Introduction to Slavic Studies

Using selected short texts easily read and understood by students whose background in Russian may be limited, this course is intended to introduce students to techniques of literary analysis and interpretation.
Prerequisite: RUS 152 or RUS 195 or permission of instructor.

Fall, 3 credits
Staff

RUS 204 Survey of Russian Literature

A chronological survey of Russian literature from its beginnings to the present with stress on defining the periods therein. All readings will be in Russian.
Prerequisite: RUS 152 or 195 or equivalent.

Spring, 3 credits
Staff

RUS 205, 206, 207 Genre Studies

Intensive study of specific genres and their sub-genres. All work will be done in Russian. RUS 205 Russian Drama (Fall); RUS 206 Russian Prose (Spring); RUS 207 Russian Poetry (Fall).
Prerequisite: RUS 204 or permission of instructor.

3 credits each
Staff

RUS 208 The Golden Age

An intensive study of the Golden Age of Russian literature, circa 1800 to 1840. All work will be done in Russian.
Prerequisite: RUS 204 or permission of instructor.

Spring, 3 credits
Staff

RUS 209, 210 Advanced Russian Conversation and Composition

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 197, 198 or permission of instructor.

Fall and Spring, 3 credits each semester
F. Cocron

RUS 211-218 Special Author

Intensive study of specific authors. All work will be done in Russian. RUS 211 Pushkin; RUS 212 Gogol; RUS 213

Chekhov; RUS 214 Leskov; RUS 215 Minor 19th Century Authors; RUS 216 Blok; RUS 217 Mandelstam and Akhmatova; RUS 218 Minor 20th Century Authors.
Prerequisite: RUS 204 or permission of instructor.

Schedule to be announced, 3 credits each
Staff

RUS 221-228 Special Period

Intensive study of specific periods. All work will be done in Russian. RUS 221 Old Russian Literature; RUS 222 Oral Epic; RUS 223 18th Century; RUS 224 Realism; RUS 225 Symbolism; RUS 226 Futurism; RUS 227 Impressionism; RUS 228 Soviet Realism.

Prerequisite: RUS 204 or permission of instructor.

Schedule to be announced, 3 credits each
Staff

RUS 299 Directed Study in Slavic Languages

Selected readings upon demand in minor Slavic languages, e.g., Serbo-Croatian and Czech.

Variable and repetitive credit
J. Kott

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FOREIGN LANGUAGE TEACHING

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: Junior standing.

Fall and Spring, 3 credits
B. Elling

COURSES IN YIDDISH LANGUAGE AND LITERATURE

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 151, 152 Intermediate Yiddish

The reading and interpretation of Yiddish texts, with a review of Yiddish grammar, composition and conversation.
Prerequisite: YDH 112 or permission of instructor.

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 152 or permission of instructor.

Fall, 3 credits
S. Berr

YDH 206 Yiddish Novel

Intensive study of the Yiddish novel. All work will be done in Yiddish.
Prerequisite: YDH 152 or permission of instructor.

Spring, 3 credits
S. Berr

DEPARTMENT OF HISPANIC LANGUAGES AND LITERATURE

Professors: LASTRA, LLORENS, SCHULMAN, ZAVALA *(Deputy Chairman)*

Associate Professors: GIORDANO, MCKENNA

Assistant Professors: FAINBERG, LITTLE, PERISSINOTTO

Instructor: GREENFIELD

At present the department offers a variety of courses in Portuguese and a major program leading to the Bachelor of Arts degree in Spanish. Students wishing to major in Spanish should examine the requirements listed below and should consult with a departmental advisery committee member 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. Required courses for a minimum of 12 or 15 credits:	*Credits*
A. Either SPN 221, 222 Conversation and Composition I, II	6
or SPN 227 Spanish Composition for Students of Spanish-Speaking Background	3
B. SPN 290 Hispanic Cuture and Civilization	3
C. SPN 297, 298 Introduction to Hispanic Literature I, II.	6
II. Elective Courses	
Eighteen additional credits of work which must be in courses above the 200 level, to be chosen in consultation with the departmental advisory committee	18
	30-33

Note: Requirements for fulfilling the major will be determined on an individual basis by the faculty advisory committee, thus affording the student more flexibility in individual course study. The advisory committee will consist of three faculty members—two for the departmental majors, one for the non-majors. A program will be devised for each student and periodically updated and reevaluated through consultations between members of the committee and the student. Deviations or changes in the planned course of study will need to be approved by a faculty adviser of the committee prior to registration.

Placement

Entering students who wish to continue study of Spanish started in high school should register for the appropriate college course, consulting a departmental adviser in doubtful cases. Note that no graduation credit is

given for SPN 115 Elementary Spanish, if the student has had three years of high school preparation.

Teacher Training Program

Students who wish to pepare for certification as secondary school teachers of Spanish should consult appropriate departmental advisers concerning requirements and procedures of the teacher preparation program.

COURSES IN PORTUGUESE

POR 115 Elementary Portuguese

An intensive course to present the fundamentals of Portuguese grammar and to provide practice in reading, writing and speaking.

Fall and Spring, 5 credits

POR 195 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, 5 credits

POR 299 Directed Readings in Portuguese

Individually supervised readings in selected topics of Portuguese language and literature.
Prerequisite: Permission of department.

Fall and Spring, 3 to 6 credits

Hispanic Literature in Translation

SPN 109, 110 Hispanic Literature in Translation I, II

A course designed to offer the non-specialist in Hispanic literature outstanding masterpieces in translation. Readings, lectures, discussion of texts. Course content will vary from year to year.

3 credits each semester

COURSES IN SPANISH

SPN 115 Elementary Spanish

An intensive course to present the fundamentals of Spanish grammar and to provide practice in reading, writing and speaking.

Fall and Spring, 5 credits

SPN 195 Intermediate Spanish

An intensive course to develop competence in reading, writing and speaking Spanish through the interpretation of selected literary texts.
Prerequisite: SPN 115 or equivalent.

Fall and Spring, 5 credits

SPN 196 Reading Spanish

Readings in Spanish from the social and natural sciences, designed to enable the specialist student to handle difficult material in his field. This course is intended for undergraduates majoring in other disciplines and for graduate students who are preparing for proficiency examinations.
Prerequisite: SPN 115 or equivalent.

Spring, 5 credits

SPN 197 Spanish for Students of Spanish-Speaking Background

A formal study of the fundamentals of Spanish grammar. This course is designed to develop the native speaker's competence in reading and writing the language.
Prerequisite: SPN 115 or equivalent.

Fall and Spring, 5 credits

SPN 221 Conversation and Composition I

A course in the active use of Spanish, with emphasis on precision and fluency in the spoken form.
Prerequisite: SPN 195 or equivalent.

Fall, 3 credits

SPN 222 Conversation and Composition II

A course in the active use of Spanish, with emphasis on excellence in the written form.
Prerequisite: SPN 195 or equivalent.

Spring, 3 credits

SPN 227 Spanish Composition for Students of Spanish-Speaking Background

A course intended for native speakers of the Spanish language and designed to improve their competence in written Spanish.
Prerequisite: SPN 197 or equivalent.

Spring, 3 credits

SPN 290 Hispanic Culture and Civilization

The evolution of Hispanic civilization as seen through its history, art and literature.
Prerequisite: Permission of instructor.

Spring, 3 credits

SPN 297 Introduction to Hispanic Literature I

Readings in Hispanic literature chosen from various periods and from all parts of the Spanish-speaking world. This course is designed to develop the student's competence in reading literary texts through a thorough analysis of works of some difficulty.
Prerequisite: SPN 195 or 197 or equivalent.

Fall, 3 credits

SPN 298 Introduction to Hispanic Literature II

Readings in Hispanic literature chosen from various periods and from all parts of the Spanish-speaking world. This course is designed to introduce the students to the main currents of Hispanic literature through analysis of literary texts.
Prerequisite: SPN 195 or 197 or equivalent.

Spring, 3 credits

SPN 301, 302-391, 392 Studies in Hispanic Languages and Literature

The specific content of these courses will be announced annually and printed in the schedule of classes as a sub-title each semester. SPN 301, 302 Studies in Hispanic Linguistics; SPN 311, 312 Studies in Medieval Literature; SPN 321, 322 Studies in Literaure of the Renaissance (15th and 16th Centuries); SPN 323, 324 Studies in Literature of the Golden Age (16th and 17th Centuries); SPN 331, 332 Studies in Literature of the 18th Century; SPN 341, 342 Studies in Modern Literature; SPN 343, 344 Studies in Contemporary Literature; SPN 351 Studies in Antillean Literature and Culture; SPN 352 Studies in Puerto Rican Literature; SPN 361, 362 Studies in Portuguese and Brazilian Literature; SPN 391, 392 Free Seminars.
Prerequisites: SPN 297, 298 or permission of instructor or department.

3 credits each

SPN 395, 396 Directed Individual Studies in Hispanic Languages and Literature

Prerequisite: Permission of department.

3 to 6 credits

DEPARTMENT OF HISTORY

Professors: ANGRESS, [a]CHINCHILLA-AGUILAR, LAMPARD, MAIN, J. ROSENTHAL, [a]SEMMEL, TAYLOR, TRASK *(Chairman)*

Associate Professors: ÅLIN, [a]BOTTIGHEIMER, [c]BURNER, CLELAND, FOX *(Adjunct)*, [a]KUISEL, LAM, H. LEBOVICS, R. LEE, [a]R. M. LEVINE, [c]MARCUS, PRATT, F. WEINSTEIN, [c]WELTSCH, WILDMAN, J. A. WILLIAMS

Assistant Professors: CARTER, [b]COWAN, [c]GARBER, KAVENAGH, LEMAY, MCCARTHY, RAPP, TURNER

Lecturers (Adjunct): DEMUTH, SCHUYLER

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:

A. Study within the area of the major	*Credits*
Ten one-semester courses of which at least six credits must be selected from the Levels III or IV, excluding HIS 397, 398, 399	30

Note: 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.

B. Study in a related area	
Two one-semester courses beyond the introductory level in a related discipline or disciplines	6

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.

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.

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[a] On leave academic year 1973-74.

[b] On leave fall semester 1973.

[c] On leave spring semester 1974.

COURSES IN HISTORY

Please Note: Level I courses (HIS 101-160) are designed for freshmen but open to all undergraduates. Level II courses (HIS 161-299) are open to sophomores and above; Level III courses (HIS 300-399 except 391, 392) to juniors and above; Level IV courses (HIS 400-499 and 391, 392) to seniors only.

Although not all history courses are offered every year, the department attempts to cycle its offerings so that all courses are available over a two-year period.

Detailed information about all courses, including the changing subject matter in Level III and IV courses whose content varies depending on student and faculty interest, is available in the department office and should be obtained in advance of pre-registration.

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

R. Weltsch

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

R. Rapp

HIS 103, 104 Introduction to the Study of American History: The Historian as Investigator

This course will emphasize the whole process of historical inquiry: the analysis and interpretation of the raw materials, the accumulation of evidence, the use of concepts, historical argumentation, and the explanation of historical events. While occasional lectures will be given, the student will spend most of his time in a small "laboratory" working team analyzing specific historical situations.

Fall, 3 credits

K. Kavenagh

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

K. Kavenagh

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. 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.

Spring, 3 credits

W. Turner

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.

Spring, 3 credits. Not offered 1973-74.

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. Course will stress the interdisciplinary nature of urban history through a wide range of readings.

Spring, 3 credits

M. McCarthy

HIS 120 Introduction to the History of Non-Western Societies

An introductory survey of the civilization of the Middle East, South and East Asia, and Africa, with brief coverage of non-European societies in America and the Pacific. Origins and early development of non-western civilizations. The religious, political and social situation of non-western countries on the eve of the expansion of industrialized Europe (16th-18th centuries). The impact of the West.

Spring, 3 credits

J. Williams

HIS 131 Ancient History from the Classics

A study of selected readings from the works of Greek and Roman historians, orators, poets and philosophers with interpretations directed primarily at the interests of the historian.

Fall, 3 credits. Not offered 1973-74.

HIS 132 The Greek City-State

An introduction to the study of history through a consideration of the role of the city-state in Greek civilization based upon readings in both ancient sources and modern commentaries.

Spring, 3 credits. Not offered 1973-74.

HIS 133 The Medieval Imagination

A study of how the men of the Middle Ages set themselves within the context of a Christian, anthropocentric universe, as expressed in the creative literature of the civilization.

Spring, 3 credits. Not offered 1973-74.

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. Not offered 1973-74.

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

R. Cowan

HIS 137 Classics of European Social History

An examination of important landmarks in the narrative history and theoretical analysis of modern European society. Among the authors treated will be John Locke, Karl Marx, Max Weber and Ferdinand Tonnies.

Fall, 3 credits. Not offered 1973-74.

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. Not offered 1973-74.

HIS 139 Modern Imperialism

An investigation of modern empire-building, its nature and motives; a comparison of modern "imperialism" with the empires of ancient and early modern times; and an analysis of the controversy concerning theories of imperialism.

Fall, 3 credits. Not offered 1973-74.

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. Prerequisite: Freshman standing.

Fall, 3 credits

F. Weinstein

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 Israelite 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 wth 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 understandng 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. This course is identical with EDU 160.

Fall, 3 credits

A. Baskin

HIS 161 Materials and Methods in Teaching Social Studies

Methods and materials appropriate to the teaching of a broad range of subject matter in the social sciences at the high school level, designed for prospective secondary school teachers of social studies. Prerequisite: Permission of the chairman of the student's major department.

Fall, 3 credits. Not offered 1973-74.

HIS 191 American History to 1877

From the Age of Discovery, the transplantation of European culture to America, the rise of American nationalism, the democratization of American society, the clash between the industrial North and the planting South, and the triumph of industrialism.

Fall, 3 credits

H. Cleland

HIS 192 United States Since 1877

The lectures will interpret U.S. history from the end of Reconstruction to the present with discussion of the growth of industrialism and its impact upon economic, social and political life; the rise of America as a world power; and American responses to the continuing crisis of contemporary civilization. Small group seminars will explore techniques of historical investigation in studying some of the problems of the age.

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
C. Carter

HIS 194 Latin America Since 1825

The evaluation of Latin America since independence, with emphasis on political, economic and social problems.

Spring, 3 credits
Staff

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
J. Rosenthal

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
R. Cowan

HIS 197 Far Eastern Civilization

The origin and development of Far Eastern civilization from its beginning to the mid-19th century. Emphasis will be on the intellectual, artistic and institutional foundations of the traditional societies of China, Japan and Korea.

Fall, 3 credits
R. Lee

HIS 198 The Far East in Transition

This course will concentrate on the social, political and economic developments in the Far East during the last 100 years. Special attention will be given to the relationships between the United States and the Far Eastern countries.

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.

Fall, 3 credits
P. Ålin

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.

Spring, 3 credits
P. Ålin

HIS 202 History of the Roman Republic

The development of the Roman State from its earliest beginnings to the 1st century B.C. with an emphasis upon its institutions and factors which led to Roman domination of the Mediterranean area.

Fall, 3 credits. Not offered 1973-74.

HIS 203 History of the Roman Empire

History of the Roman world from the Principate of Augustus in the 1st century B.C. to the disintegration of the Western Empire in the late 15th century.
Prerequisite: HIS 202 or permission of instructor.

Spring, 3 credits. Not offered 1973-74.

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
H. Lemay

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

J. Rosenthal

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

H. Lemay

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 some other 16th century intellectual movements.

Spring, 3 credits. Not offered 1973-74.

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. Not offered 1973-74.

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

T. Angress

HIS 210 Europe 1914-Present

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

T. Angress

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

J. Main

HIS 212 American Colonial Society

Political, economic, social and cultural characteristics of the colonies during the 18th century.

Spring, 3 credits. Not offered 1973-74.

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

J. Main

HIS 214 The Early National Era

Political, economic, social and cultural developments, from the American Revolution to the rise of Jackson.

Spring, 3 credits. Not offered 1973-74.

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.

Spring, 3 credits. Not offered 1973-74.

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.

Fall, 3 credits. Not offered 1973-74.

HIS 217 Recent U.S. History, 1877-1918

The growth of industrialism in the United States and its impact on political, economic, and intellectual life, and on American relations with the outside world through World War I.

Fall, 3 credits. Not offered 1973-74.

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.

Fall, 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 or permission of instructor.

Fall, 3 credits
E. Lampard

HIS 220 History of Canada

Examines major issues in Canadian history: Is Canadian basically distinct from American society? How does Canada develop as a separate North American State? How do the French survive as a separate group in Canada?

Fall, 3 credits
J. Williams

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. Not offered 1973-74.

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. Not offered 1973-74.

HIS 223 Latin America and the Outside World

An analysis of the role of the Latin American nations in world affairs during the 19th and 20th centuries with emphasis on intellectual, economic and diplomatic relations with the United States and Europe.

Fall, 3 credits
Staff

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
C. Carter

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. Not offered 1973-74.

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. Not offered 1973-74

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 atten-

tion 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. Not offered 1973-74.

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. Not offered 1973-74.

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. Not offered 1973-74.

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. Not offered 1973-74.

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. Not offered 1973-74.

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. Not offered 1973-74.

HIS 238 History of the British Commonwealth

The political, social and economic development of Australia, New Zealand, Canada and South Africa, studied comparatively.
Prerequisites: HIS 191, 192 or HIS 196 or permission of instructor.

Fall, 3 credits. Not offered 1973-74.

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.

Fall, 3 credits. Not offered 1973-74.

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. Not offered 1973-74.

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
A. Wildman

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

A. Wildman

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

F. Weinstein

HIS 244 East Central Europe, 1453-1945

A survey of the territorial belt between the German and Russian power bases; the rise and decline of the Polish, Bohemian and Hungarian kingdoms; the role of the Hapsburg Empire; the Eastern question; the national movements up to World War II.

Spring, 3 credits. Not offered 1973-74.

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. Not offered 1973-74.

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. Not offered 1973-74.

HIS 251, 252 History of Science

The first semester will deal with the Greek scientific tradition and with the manner in which that tradition later was transformed during the scientific revolution of the 16th and 17th centuries. The second semester will be devoted to scientific developments of the 18th and 19th centuries. Some attention will also be given to the growth of science as a social institution.

Prerequisites: For HIS 251, two semester courses in natural science or equivalent or permission of instructor; for HIS 252, HIS 251 or permission of instructor.

Fall and Spring, 3 credits each semester. Not offered 1973-74.

HIS 253 Social and Intellectual History of Europe, 1648-1848

Social and political thought in post-Reformation Europe, the Age of Enlightenment, 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. Not offered 1973-74.

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

E. Garber

HIS 256 Expansion of Europe, 1800 to the Present

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.

Prerequisite: HIS 255 or permission of instructor.

Spring, 3 credits. Not offered 1973-74.

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. Not offered 1973-74.

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. Not offered 1973-74.

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: Six credit hours of biology or permission of instructor.

Fall, 3 credits. Not offered 1973-74.

HIS 262 Contemporary China

This course will examine the history of China from the Revolution of 1911 to the present day. It will emphasize the intellectual, social and political movements of 20th century China.

Fall, 3 credits

R. Lee

HIS 263 A History of Southeast Asia to 1500

The historical development of the countries of Southeast Asia to the 15th century with reference to their political, artistic and religious components. The impact of Indian and Chinese cultures will be viewed against the background of the indigenous inheritance.

Fall, 3 credits

T. Lam

HIS 264 A History of Southeast Asia from 1500 to the Present

A study of the impact of western imperialism in Southeast Asia. The rivalry between the European powers and their pattern of economic and territorial expansion will be examined against the background of Southeast Asian historical development.

Prerequisite: Some background in early Southeast Asian history is desirable.

Spring, 3 credits

T. Lam

HIS 265 Japan Before the Modern Era

The course will examine the historical development of Japan in its major political, social, economic and cultural aspects from pre-history to the end of the Tokugawa Shogunate in 1868.

Fall, 3 credits. Not offered 1973-74.

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. Not offered 1973-74.

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.

Fall, 3 credits. Not offered 1973-74.

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. Not offered 1973-74.

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

W. Taylor

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

W. Taylor

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.

Spring, 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.

Fall, 3 credits

D. Trask

HIS 277 History of American Labor to 1900

The labor force and the labor movement from colonial times through the coming of the industrial revolution, the labor movement of the Jacksonian era, the Knights of Labor and the AFL, and the influence of agrarians, anarchists and socialists.

Fall, 3 credits

H. Cleland

HIS 278 History of American Labor Since 1900

American worker and his world in the 20th century; the IWW, AFL and CIO; the rise and decline of the American Communist Party; mass production and scientific management; unions and political action; and union interrelationships with ethnic groups.

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 or permission of instructor.

Fall, 3 credits. Not offered 1973-74.

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 or permission of instructor.

Spring, 3 credits. Not offered 1973-74.

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. Not offered 1973-74.

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 or permission of instructor.

Spring, 3 credits. Not offered 1973-74.

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. Not offered 1973-74.

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. Not offered 1973-74.

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. Not offered 1973-74.

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. Not offered 1973-74.

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
R. Rapp

HIS 289, 290 History of Spain, 711-1808

Political history set in its social, economic and international background. The first semester will consider developments in Spain from the Islamic Conquest to the accession of Charles V in 1516. The second semester will consider Spanish history under the Hapsburg and Bourbon dynasties down to the fall of the Ancien Régime with the Napoleonic invasion in 1808.
Prerequisite for HIS 290: HIS 289 or permission of instructor.

Fall and Spring, 3 credits each semester. Not offered 1973-74.

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. Not offered 1973-74.

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

R. Rapp

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 295 History of the American South, 1790 to the Present

A history of the South as a distinctive American region. The course will emphasize those features of Southern life and institutions which have distinguished the South in its development from other parts of the United States.

Fall, 3 credits. Not offered 1973-74.

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

P. Ålin

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, Revolution, Fascism, population and topics in particular national histories.

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.

Fall, 3 credits

J. Rosenthal

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.

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.

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.

Prerequisite: Varying with subject. Consult departmental list of courses.

Fall, 3 credits

E. Garber

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 subjects as Chinese communism, nationalism in Southeast Asia, and the intellectual history of China.
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 the 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
M. McCarthy

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
M. McCarthy

HIS 399 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: Junior or senior standing and permission of the department.

Fall and Spring, 1 to 3 credits
Staff

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.

Prerequisite: Senior major standing or permission of instructor.

HIS 410 Colloquium in American History

Fall, 3 credits
K. Kavenagh

HIS 411 Colloquium in American History

Fall, 3 credits
W. Turner

HIS 412 Colloquium in American History

Spring, 3 credits. Not offered 1973-74.

HIS 413 Colloquium in American History

Spring, 3 credits. Not offered 1973-74.

HIS 421 Colloquium in Latin American History

Fall, 3 credits. Not offered 1973-74.

HIS 422 Colloquium in Latin American History

Spring, 3 credits. Not offered 1973-74.

HIS 430 Colloquium in European History

Fall, 3 credits. Not offered 1973-74.

HIS 431 Colloquium in European History

Fall, 3 credits. Not offered 1973-74.

HIS 432 Colloquium in European History

Spring, 3 credits. Not offered 1973-74.

HIS 433 Colloquium in European History

Spring, 3 credits. Not offered 1973-74.

HIS 461 Colloquium in Asian History

Fall, 3 credits. Not offered 1973-74.

HIS 462 Colloquium in Asian History

Spring, 3 credits. Not offered 1973-74.

Graduate Courses

Undergraduate senior history majors may, with the permission of the instructor, be admitted to the following 500 level graduate history courses. Credits earned may be used in lieu of a Level IV course to satisfy the requirements of the major. Students should consult the instructor and the departmental list of courses to ascertain the background assumed for the course.

Offered: Fall, 1973

HIS 509 Reading Seminar in Eastern Europe Since 1801
A. Wildman

HIS 510 Reading Seminar in Intellectual European History
E. Lebovics

HIS 511 Reading Seminar in History of Science
E. Garber

HIS 516 Reading Seminar in Modern Europe: Imperialism
J. Williams

HIS 518 Reading Seminar in Economic (European) History
R. Rapp

HIS 522 Reading Seminar in The American Revolution, 1760-1789
J. Main

HIS 528 Reading Seminar in U.S. Industrial Society to 1900
E. Lampard

HIS 531 Reading Seminar in Social and Intellectual U.S. History Since 1865
W. Taylor, D. Fox

HIS 544 Reading Seminar in Latin American History
C. Carter

Offered: Spring, 1974

HIS 505 Reading Seminar in Western Europe since 1789
F. Weinstein

HIS 543 Reading Seminar in Colonial Latin America
C. Carter

INTERDISCIPLINARY PROGRAM IN IBERO-AMERICAN STUDIES

Director: SCHUYLER

Faculty Advisory Committee:

Anthropology—CARRASCO, WEIGAND

Art—CASTEDO

Economics—ZSCHOCK

History—R. LEVINE

Romance Languages—SCHULMAN

The program in Ibero-American studies (IAS) is designed to introduce students to the culture and civilization of Latin America, Spain and Portugal and to provide initial preparation for careers in education, business and government. In consultation with his adviser, the student may select a coherent program of at least ten courses (30 credits) from the wide variety of approved offerings, combining courses in two or more related fields with integrated disciplinary core courses at the introductory and upper levels required of all students in the program. Students are encouraged to combine the Ibero-American studies major with a disciplinary major and in most cases, approved courses will also satisfy departmental requirements.

IAS majors are urged to spend a semester or year in Latin America or the Caribbean. Opportunities for foreign study are provided by Stony Brook's program at the Universidad Ibero-Americana, Mexico City and by other SUNY campuses in Latin America and Puerto Rico. Every effort will be made to assist qualified students to study in Latin America.

Requirements for the Major in Ibero-American Studies

In addition to the general university requirements for the Bachelor of Arts degree, students majoring in Ibero-American studies must complete the following requirements:

I. Courses in Ibero-American Studies	*Credits*
A. IAS 121, 122 Introduction to Ibero-American Civilization I, II	6
B. IAS 401, 402 Colloquium in Ibero-American Studies (Senior standing and permission of instructor)	6
II. Related Courses	
Six courses chosen in consultation with the student's academic adviser from among the approved courses. (See list below.)	18
	30

III. Language

Demonstrated proficiency in Spanish or Portuguese. No specific course work is required but the students are expected to pass a proficiency test, under normal circumstances prior to beginning their senior years measuring ability in oral and written Spanish or Portuguese. Regular or special intensive courses will be made available to enable students to acquire or improve their language skills.

Courses Approved for Ibero-American Studies

In addition to the courses listed below, and after consultation and approval by advisers, students would also be able to take "Topics" courses, colloquia, and directed reading courses that deal with Ibero-America.

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 257 The Past of the New World
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 and Architecture in Spain and Italy
ART 214 Ibero-American Plateresque and Baroque Art and Architecture
ART 215 Latin American Art
ART 216 Modern Latin American Art
ART 217 Pre-Columbian 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 223 Latin America and the Outside World
HIS 224 Modern Mexico
HIS 227 Colonial and Neo-Colonial Brazil †
HIS 228 Modern Brazil †

† Not offered 1973-74.

HIS 229 Argentina Since 1810 †
HIS 289, 290 History of Spain, 711-1808 †
HIS 330, 331 Topics in Latin American History
HIS 355, 356 Topics in World History
HIS 421, 422 Colloquium in Latin American History†

Linguistics
LIN 251 History of the Spanish Language

Political Science
POL 209 Politics in Developing Areas
POL 392 Seminar in Advanced Topics (Latin America)

Puerto Rican Studies
PRS 101, 102 Civilization and Culture of Puerto Rico I, II
PRS 202 Educating the Puerto Rican Child
PRS 220 Government and Politics in Puerto Rico
PRS 295 Topics in Puerto Rican Studies

*Hispanic Languages and Literature**
SPN 290 Hispanic Culture and Civilization
SPN 297 Introduction to Hispanic Literature I
SPN 298 Introduction to Hispanic Literature II
SPN 321, 322 Studies in Literature of the Renaissance (15th and 16th Centuries)
SPN 323, 324 Studies in Literature of the Golden Age (16th and 17th Centuries)
SPN 331, 332 Studies in Literature of the 18th Century
SPN 341, 342 Studies in Modern Literature
SPN 343, 344 Studies in Contemporary Literature
SPN 351 Studies in Antillean Literature and Culture
SPN 352 Studies in Puerto Rican Literature
SPN 361, 362 Studies in Portuguese and Brazilian Literature
SPN 391, 392 Free Seminars

COURSES IN IBERO-AMERICAN STUDIES

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

* The specific content of courses will be announced annually and printed in the registrar's class schedule as a subtitle each semester.
† Not offered 1973-74.

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 for 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. Prerequisites: Senior standing and permission of instructor.

Fall and Spring, 3 credits each semester
Staff

Further information may be obtained from the director or from members of the faculty advisery committee.

INTERDISCIPLINARY COURSES

Note: INT courses may not be used to fulfill general university requirements in natural sciences, social and behavioral sciences, or arts and humanities. They are intended for elective credit only.

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 252 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. "Daybook" 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.

Prerequisites: Either PSY 211 or EDU 103 or the equivalent *and* permission of the instructors.

Corequisite: INT 281.

Fall and Spring, 3 credits. For elective credit only.
Staff

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 techniques for organizing group and individual energies.

Prerequisites: Either PSY 211 or EDU 103 or the equivalent *and* permission of the instructors.
Corequisite: INT 280.

Fall and Spring, 3 credits. For elective credit only.

Staff

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.

Prerequisite: EGL 107 or permission of instructor. 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

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.

JUDAIC STUDIES

Instructor: S. D. Sperling

COURSES IN HEBREW AND CIVILIZATION OF ISRAEL

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

Staff

HBW 151, 152 Intermediate Hebrew

An intermediate course in conversation, composition and the reading of texts in modern Hebrew.
Prerequisites: HBW 111, 112 or permission of instructor.

Fall and Spring, 3 credits. Not offered 1973-74.

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 or permission of instructor.

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 121 or permission of instructor.

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 121 or permission of instructor.

Fall, 3 credits

M. Lichtenstein

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.
Prerequisite: HBW 221 or permission of instructor.

Spring, 3 credits. May be repeated once for credit with permission of instructor.

D. Sperling

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, Megged, Jehosua and Oz. The course will acquaint the students with the ideological, cultural and literary background of the literature of Israel.
Prerequisite: Fluency in the Hebrew language.

Spring, 3 credits

R. Beizer

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

D. Sperling

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

G. Hundert

INT 252 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.
Prerequisite: INT 150 or INT 151 or permission of instructor.

Spring, 3 credits. For elective credit only

D. Sperling

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:

	Credits
Area or department A	12
Area or department B	12
Area or department C	9
Any area(s) or department(s)	27
	60

Notes: At least 45 of the 60 credits must be in courses in the College of Arts and Sciences.

At least 36 of the 60 credits must be taken for a letter grade; except that students who have taken part in the Residential Studies Program (Experimental College), may count 30 credits of P toward the major.
In the distribution requirements outlined above, the two semesters of the Residential Studies Program may be used to fulfill Areas A and B, but in no case may more than 30 credits of Residential Studies work be counted toward the major.

INTERDISCIPLINARY PROGRAM IN LINGUISTICS

Chairman: F. ANSHEN

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 Methods of Linguistic Description
   LIN 211 Introduction to Syntax
2. One year of a non-Indo-European language
3. Seven additional courses to be selected after consultation with the student's adviser
4. Two years of a modern foreign language

For further information about the linguistics program, consult the program chairman.

COURSES IN LINGUISTICS

LIN 102 Methods of Linguistic Description

An introduction to phonology and morphology.

Spring, 3 credits

Staff

* To help the student to identify courses beyond the introductory level, lists are available in the Undergraduate Studies Office, where academic advisers will assist in program planning. These advisers should be consulted *prior to* the student's senior year.

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. This course is identical with EGL 282.

Fall and Spring, 3 credits

F. Anshen

LIN 201 Phonetics

Special emphasis on developing the ability to recognize and produce the more commonly used sounds among the languages of the world.
Prerequisite: LIN 102.

Fall, 3 credits

A. Davison

LIN 204 Phonology

This course deals with the problem or how the sound systems of languages are structured. Major emphasis will be given to the theory of generative phonology, but the theories of the post-Bloomfieldians, the Prague School and the stratificationalists will also be considered.
Prerequisite: LIN 201.

Spring, 3 credits

A. Davison

LIN 211 Introduction to Syntax

An introduction to transformation-generative grammar. Special attention will be given to the grammar of English. This course is identical with EGL 280.

Fall and Spring, 3 credits

Staff

LIN 221 Morphological Analysis

The principles of generative phonology, applied morphophonemics and morphology.

Prerequisite: LIN 102.

Fall and Spring, 3 credits

B. Hall

LIN 241 History of Linguistics

Pānini, Greek and Roman grammarians, 19th century European comparativists, and American structuralists will be among the linguistic schools studied.

Spring, 3 credits. Not offered 1973-74.

LIN 250 History and Structure of the English Language

The development of the English language from its Indo-European origins.
Prerequisite: LIN 211/EGL 280.

Fall and Spring, 3 credits

S. Spector

LIN 251 History of the Spanish Language

This course is identical with SPN 324.
Prerequisite: LIN 102.

3 credits. Schedule to be announced.

LIN 252 Comparative Semitic Grammar

Introduction to the characteristics and the classification of the Semitic languages with special attention to Hebrew, Aramaic, Ugaritic, Akkadian and Arabic. Analysis of phonology and phonetic changes, analysis of morphology with special emphasis on tenses and moods in the verbal system as well as on patterns of noun-formation.
Prerequisite: One linguistic course or one year of any Semitic language.

Spring, 3 credits

D. Sperling

LIN 261 Introduction to Sociolinguistics

An examination of the interaction between language and society. Examples will be drawn largely from English.
Prerequisites: LIN 102 and LIN 211.

Fall and Spring, 3 credits

F. Anshen

LIN 263 Language and Culture

The study of language as an aspect of culture; the relation of habitual thought and behavior to language; the problem

of meaning. This course is identical with ANT 263.
Prerequisite: ANT 102 or permission of instructor.

Fall, 3 credits

S. Regelson

LIN 301 Mathematical Aspects of Linguistics

An introduction to the mathematical concepts and procedures which underlie much contemporary linguistic practice.
Prerequisite: LIN 211/EGL 280.

Fall and Spring, 3 credits

F. Anshen

LIN 311 Advanced Syntax

A detailed consideration of syntactical problems in English and other languages, within a transformational-generative framework.
Prerequisite: LIN 211/EGL 280.

Fall, 3 credits

Staff

LIN 320 Discourse Analysis of English

An investigation of the principal theories of grammatical constraints on units larger than the sentence.
Prerequisite: LIN 211/EGL 280.

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. This course is identical with EDU 329.
Prerequisites: A course in linguistics, in psychology and in research methodology, or permission of instructor.

Fall and Spring, 3 credits

A. Carton

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

Problem of sampling interview technique, 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.
Prerequisites: LIN 201 and LIN 211.

Spring, 3 credits

S. Regelson

LIN 399 Readings in Linguistics

Qualified juniors and seniors in linguistics will be offered the opportunity to read selectively under the guidance of a faculty member.
Prerequisite: Permission of department.

Fall and Spring, variable credit

Staff

DIVISION OF MATHEMATICAL SCIENCES

The Division of Mathematical Sciences consists of three departments: applied mathematics and statistics, computer science and mathematics. Undergraduate studies in the division are centered around the three independent programs under the direction of the departments in the division. Each department encourages its majors to take courses in the other two departments of the division 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 the programs of the division are academically in the College of Arts and Sciences. Upon graduation they receive Bachelor of Science degrees.

Secondary Teacher Preparation Program

Director of Teacher Preparation: P. KUMPEL

The division offers 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 director of teacher preparation for the division after completing MSM 151 or MSM 193, and before beginning the junior year. Requirements include:

1. Completion of one of the majors (MSA, MSC, MSM) in the division.
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 (EDU 350, 354) 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 professional course work in education as specified by the Office of Teacher Preparation: one course in social foundations (e.g., EDU 102, 160, 345, or SOC 287), and one course in pspchological foundations (e.g., EDU 201, 204, 335).

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: BELTRAMI, DICKER, DOLEZAL, GERST, TEWARSON, ZEMANIAN *(Acting Chairman)*

Associate Professors: CHEN, DUNCAN, KIM, LEIBOWITZ, SRIVASTAV

Assistant Professors: GRAN, TUCKER *(Director of Undergraduate Studies)*

The Department of Applied Mathematics and Statistics offers an undergraduate program leading to the B.S. degree. The program is intended to prepare the student for graduate study in applied mathematics or for certain positions in industry and government. It also provides a relevant and meaningful background for those planning to specialize professionally in the mathematical aspects of medicine, economics, urban science and engineering.

The course offerings in applied mathematics are designed with a view towards their utilization in the physical, social, biological and behavioral sciences. The last several decades have been witness to the increasing use of mathematical methods in nearly all fields of endeavor and the consequent need for trained applied mathematicians who can play an important role in the development of quantitative models and solution techniques for a broad array of challenging problems. To cite just a few examples of diverse areas where applied mathematics is now playing a crucial role, one can mention: space flights and ecology, where nonlinear differential equations are important tools; computer design and the allocation of urban resources, where use is made of linear programming optimization techniques and combinatorial methods; genetics and communication systems, where probabilistic and algebraic methods are employed; economic theory which employs systems analysis and operations research.

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; PSY 381, 382; PHY 343, 344.)

Recommendations for Students Majoring in Applied Mathematics and Statistics

Most courses offered by the Department of Applied Mathematics and Statistics fall into one of two general areas: Area I—natural science (physics, chemistry, engineering) related mathematics—MSA 217, 226, 227, 301, 302, 321, 324, 351, 352, 371 and MSI 201, 202; and Area II—operations research and social science related mathematics—MSA 201, 202, 251, 252, 316, 325, 331, 333, 334. However, some courses (especially MSA 217 and MSA 251) have substantial application in both areas. Normally a student majoring in applied mathematics and statistics tends to concentrate in one of these two areas. Double majors are encouraged.

The department encourages students interested in Area I to take:

1. Basic courses in the natural sciences (especially PHY 101, 102 and 151);
2. The following courses from Area I: MSA 226, 227 and 217 (plus other courses in Area I);
3. The following courses from Area II: MSA 251 and either MSA 201 or MSA 252.

The department encourages students interested in Area II to take:

1. Basic courses in the social and behavior sciences (ECO 100, PSY 101, SOC 103);
2. The following courses from Area I: MSA 217, MSA 226;
3. The following courses from Area II: MSA 201, MSA 251, 252 (plus other courses in Area II).

COURSES IN APPLIED MATHEMATICS AND STATISTICS

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 life 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

J. Alessi

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 distribu-

tions, 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

A. Friedman

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

A. Tucker and Staff

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 analysing 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 or permission of instructor.

Spring, 3 credits

A. Tucker

[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

I. Gerst, A. Tucker

[MSI 201, 202 Advanced Calculus for Scientists I, II]

(See description under Interdepartmental Courses in Mathematical Sciences.)

MSA 217 Ordinary Differential Equations

This course deals with the theory and properties of ordinary differential equations which are of importance in the application of this subject. Among the topics covered are solutions of singular equations; boundary value problems; the Green's function method; eigenvalue problems; oscillation and non-oscillation theorems, asymptotic behavior of linear systems; non-linear autonomous systems; focal, nodal and saddle points; cycles; stability; Lyapunov functions; the van der Pol, Liénard and Duffing equations; approximate solutions.
Prerequisite: MSM 151.

Fall, 3 credits

W. J. Kim

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

R. Tewarson

MSA 227 Approximation Theory

Smoothing of data, least squares methods, interpolation, polynomial approximation and quadrature formulas.
Prerequisite: MSM 152.

Spring, 3 credits
I. Gerst

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 251, 252 except by petition to department curriculum committee.)
Prerequisite: MSM 122 or MSM 191.

Fall and Spring, 3 credits
Staff

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.
Prerequisite: MSM 122 or MSM 191.

Fall and Spring, 3 credits each semester
Staff

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 1973-74.

MSA 316 Mathematical Programming

Formulation of linear programming models. The simplex method and its variations. The duality theorem. Sensitivity analysis. Solution of practical problems in blending, transportation, etc., with the help of computers.
Prerequisite: MSM 151.

Spring, 3 credits
A. Tucker

MSA 321 Mathematics of Networks

Review of complex variables and Laplace transforms. Properties of positive real functions and Hurwitz polynomial. Matrix analysis of networks. Derivation of positive real character of RLC driving-point impedances. Synthesis of two-element kind networks. Use of Bott-Duffin and Darlington techniques for synthesis of RLC networks. Synthesis of transfer functions using RC and RLC networks. Design of lossless filters with loading. Use of negative impedance converter and isolation amplifier in design of driving-point and transfer functions. Introduction to approximation techniques in the frequency and time domains. Amplitude and frequency scaling. Design of specific filters, delay lines, phase shifters and oscillators.
Prerequisite: MSM 152.

Spring, 3 credits. Not offered 1973-74.

MSA 324 Special Functions of Applied Mathematics

A study of the more common higher mathematical functions which are required for the analytical solution of engineering and scientific problems. The Bessel, Legendre, hypergeometric and Mathieu functions are among those to be considered. Topics include: orthogonal sets of functions, recursion formulas, series solution of linear differential equations, Fourier-Bessel expansions, asymptotic expansions, functional equations, application to boundary value and initial value problems.
Prerequisite: MSM 152.

Fall, 3 credits. Not offered 1973-74.

MSA 325 Introduction to Operations Research

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
E. Beltrami

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 either MSA 250 or 251.

Spring, 3 credits
D. Dicker

MSA 333, 334 Mathematical Foundations of Economics I, II

An extensive survey of mathematical economics both from a contemporary axiomatic viewpoint (Debrew-type) and from a neo-classical viewpoint (Samuelson-type). Topics include utility theory, input-output models and general equilibrium theory.
Prequisites: MSM 152 and MSM 201.

Fall and Spring, 3 credits each semester
P. Kalman

MSA 351, 352 Mathematical Models in the Physical Sciences I, II

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 and Spring, 3 credits each semester
Staff

MSA 353 Design and Analysis of Experiments

Theory of least squares, the general linear hypothesis and analysis of variance, analysis of multiple classification, randomized blocks, Latin squares.
Prerequisite: MSA 250 or 252 or permission of instructor.

Fall, 3 credits
Staff

MSA 371 Optimization Theory

Multiplier rules and constrained minimization. An introduction to the calculus of variations and control theory.
Prerequisite: MSI 201.

Spring, 3 credits
Staff

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

DEPARTMENT OF COMPUTER SCIENCE

Professors: FINERMAN, GELERNTER, HELLER, KIEBURTZ *(Chairman)*, PAZ *(Visiting)*, D. R. SMITH, TYCKO

Associate Professor: BERNSTEIN *(Director of Undergraduate Studies)*

Assistant Professors: AKKOYUNLU, CHERNIAVSKY, FIDUCCIA, ZALCSTEIN

Instructor: P. SIEGEL

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. MSC 101, 102 and three courses from among MSC 201, 302, 303, and 304
   B. MSM 121, 122, 151 (or MSM 191, 192, 193) and MSM 211
   C. MSA 201, 226 and 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.

Note: To achieve the necessary depth in specific fields students are encouraged to elect their remaining credits from the course offerings in no more than two disciplines chosen according to their sceondary interests.

Pass/No Credit Option

A student may, with permission of his or her adviser, register for a Pass/NC grade in any course not used to satisfy the requirements of I or II above.

Sample Program (required courses only)

Freshman	*Sophomore*	*Junior*	*Senior*
MSM 121	MSM 151	MSA 201	MSA 251
MSM 122	MSM 211	MSA 226	ESE 318
MSC 101	MSC 201*	MSC 303*	MSC 302*
MSC 102		MSC 304*	

COURSES IN COMPUTER SCIENCE

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

R. Kieburtz

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, 3 credits

P. Siegel

MSC 201 Advanced Programming

Advanced non-numeric problem solving techniques. List processing and string manipulation; specialized languages (such as LISP and SNOBOL); description, manipulation and use of data structure facilities; commercial and scientific applications.
Prerequisite: MSC 101.

Fall and Spring, 3 credits

Y. Zalcstein (Fall), E. Akkoyunlu (Spring)

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.
Prerequisites: MSC 102, ESE 318.

Spring, 3 credits

D. Smith

MSC 303 Introduction to the Theory of Computation

Finite state machines and regular expressions. Turing machines, the halting problem, computable numbers, recursive functions, formal languages.
Prerequisite: MSC 102.

Fall, 3 credits

C. Fiduccia

* Three of these four courses are required.

MSC 304 Introduction to Systems Programming

Topics studied include elementary data structures, including arrays and linked lists, pushdown stacks, trees and transfer vectors. Basic computer programming systems such as loaders, assemblers, compilers and simple monitors will be investigated.
Prerequisite: MSC 102.

Spring, 3 credits
D. Tycko

DEPARTMENT OF MATHEMATICS

Professors: ADLER, AX, BARCUS, CHARLAP, CHEEGER, DOSS, DOUGLAS, FARKAS, GARLAND, GROMOLL, KRA, KUGA, LISTER, MASKIT *(Chairman)*, PINCUS, SAH, J. SIMONS, STRASSER, SZÜSZ

Associate Professors: EBIN, W. FOX *(Director of the Graduate Program)*, FRIED, HILL, HOWE, KUMPEL *(Director of Teacher Preparation)*, LAUFER, MEYER, OSHER, PHILLIPS, THORPE *(Director of the Undergraduate Program)*, ZAUSTINSKY

Assistant Professors: L. BROWN, FRANK, HELTON, STONE, YAU

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 Division of 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 Division of 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 adviser 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 IN MATHEMATICS*

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.
Prerequisite: Permission of instructor.

Fall and Spring, 1 to 6 credits, repetitive.
D. Stone

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
H. Laufer

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
H. Laufer

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
J. Thorpe and Staff

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
J. Thorpe and Staff

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* Note: Staff listed are those who taught during the 1972-73 academic year. For further information consult the department.

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

J. Pincus

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

D. Ebin

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.

Fall and Spring, 3 credits

D. Frank

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

S. Osher

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

D. Prener

MSM 191, 192, 193, 194 Honors Calculus I-IV

This four-term sequence is designed for students with above-average 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 finding the material inappropriate for them will be encouraged to transfer into the regular calculus sequence in the first few weeks or after completing MSM 191, which satisfies the prerequisite for MSM 122. Students taking this honors sequence may not take for credit: MSM 121, 122, 123, 151, 152, 201 or 202.

Fall (MSM 191, 193) and Spring (MSM 192, 194), 4 credits each semester

H. Sah, H. Garland

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

D. Ebin

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

B. Maskit

[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

W. Fox

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.
Prerequisite: MSM 211.

Fall and Spring, 3 credits

W. Barcus

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

M. Kuga

MSM 216 Linear Algebra

Vector spaces over fields, linear transformations, the orthogonal and unitary groups, canonical forms for matrices, the spectral theorem, multilinear algebra.
Prerequisite: MSM 151 or MSM 192.

Fall and Spring, 3 credits

E. R. Strasser

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

M. Kuga

[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

P. Kumpel

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

D. Gromoll

MSM 241 Geometric Structures

Formal geometries, their relationship and interpretations; projective, affine, Euclidean and non-Euclidean geometries.
Prerequisite: MSM 211.

Spring, 3 credits

A. Poor

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 Division of Mathematical Sciences. Nevertheless, majors in the division are encouraged to take it.
Prerequisite: MSM 122 or MSM 191.

Spring, 3 credits
A. Adler

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
D. Prener

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
A. Phillips

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_p.
Prerequisite: MSM 202 or MSM 194.

Spring, 3 credits
C. Pearcy

MSM 303, 304 Non-Linear Ordinary Differential Equations

Singular points of vector fields, the degree and index of a mapping, limit cycles, the existence and stability of periodic solutions, differential equations of second order, approximation methods including the Poincarè 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
J. Ax

MSM 305, 306 Partial Differential Equations

Fourier series, orthogonal functions, eigenfunctions 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
J. Ax

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
H. Farkas

MSM 323 Introduction to Differential Geometry

Geometry of surfaces in 3-space. Introduction to manifolds and to Riemannian ge-

ometry.
Prerequisite: MSM 202 or MSM 194.

Fall and Spring, 3 credits

J. Simons

MSM 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

J. Cherniavsky

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. Strasser (391), S. T. Yau (392)

Graduate Courses

Junior and senior mathematics students of above average ability are encouraged to take graduate courses in mathematics. Permission of the instructor is a prerequisite for registering in a graduate course. See *Graduate Bulletin* for details.

MSM 520 Algebra I
MSM 521 Algebra II
MSM 522 Algebraic Topology I
MSM 523 Algebraic Topology II
MSM 524 Complex Analysis I
MSM 525 Complex Analysis II
MSM 526 Real Analysis I
MSM 527 Real Analysis II
MSM 530 Homological Algebra
MSM 532 Group Theory
MSM 534, 535 Theory of Numbers
MSM 536, 537 Algebraic Geometry
MSM 550, 551 Riemann Surfaces and Automorphic Functions
MSM 552, 553 Complex Manifolds
MSM 554, 555 Functional Analysis
MSM 556, 557 Harmonic Analysis
MSM 560, 561 Partial Differential Equations
MSM 566 Differential Topology
MSM 568, 569 Differential Geometry
MSM 570, 571 Lie Groups and Homogeneous Spaces
MSM 572, 573 Analysis on Manifolds
MSM 574 Minimal Varieties
MSM 576 Characteristic Classes
MSM 578 Comparison Theorems in Riemannian Geometry
MSM 580, 581 Student Seminar in Geometry
MSM 590, 591 Logic
MSM 597 Seminar
MSM 598 Independent Study
MSM 650, 651 Topics in Algebra
MSM 652, 653 Topics in Algebraic Topology
MSM 654, 655 Topics in Analysis
MSM 658, 659 Topics in Complex Analysis
MSM 660, 661 Topics in Logic

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

J. Pincus

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

S. T. Yau

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

S. P. Wang

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

P. Kumpel (237), W. Lister (238)

DEPARTMENT OF MUSIC

Professors: Arel, Layton, Lessard, [a]Lewin, Nemiroff, [b]Rosen

Associate Professors: Baron, Bonvalot, Zukofsky

Assistant Professors: Ekwueme, Fuller *(Acting Chairman)*, Lawton, Winkler

Instructors: Kramer, L. Starr, Wolf

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[a] On leave academic year 1973-74.

[b] On leave Spring semester 1974.

Director of the University Band: KARASICK

Performing Artists in Residence: ADDISON, ANDERSON, BREHM, CANIN, DES ROCHES, DUPOUY, EDDY, FROELICH, GLAZER, GREENHOUSE, G. KALISH, KREISELMAN, ROSEMAN, 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 Foundations of Musicianship II
MUS 125 Modal Counterpoint I
MUS 127, 128 Tonal Harmony I, II
MUS 201 Analysis of Tonal Music
MUS 203 Analysis of 20th Century Works

2. History and Literature
MUS 143 Western Music Before 1600
MUS 144 Western Music from 1600 to the Early 19th Century
MUS 249 Western Music of the 19th and 20th Centuries
Three additional courses numbered 341 or higher, to be chosen in consultation with the student's adviser. The courses should be distributed among a range of historical periods.

3. Performance
At least one course from the groups MUS 161-199 Secondary Instrument or Voice or MUS 261-299 Primary Instrument or Voice every semester.
MUS 114 University Chorus or MUS 115 University Orchestra or MUS 116 University Band for four semesters. (MUS 145 Collegium Musicum may count for two semesters of this requirement.)

Note: Although there is no upper limit on the number of credits a student may elect in Performance, no more than 32 credits in this area 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. A student who has not passed the proficiency test by the end of the second year of study will not be permitted to continue as a music major. The test may be waived in the case of an obviously qualified student upon the recommendation of the piano instructor.

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.

COURSES IN MUSIC

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

P. Wolf (Fall), R. Kramer (Spring)

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.

Spring, 3 credits

P. Winkler

MUS 110 Music in the Society of Sub-Saharan Africa

A survey of the role and function of music among the peoples of sub-Saharan Africa. Discussion will include traditional music in the so-called "tribal" society and contemporary trends in African music-making as affected by such external influences as Islam, Christianity, urbanization, mass communications and other aspects of western civilization.

Fall, 3 credits

L. Ekwueme

MUS 114 University Chorus

Study and performance of a repertory from the Middle Ages to the present. More than four unexcused absences from rehearsals eliminates credit.
Prerequisite: Auditions.

Fall and Spring, 1 credit

MUS 115 University Orchestra

Study and performance of works from the repertory of the concert orchestra. More than four unexcused absences from rehearsals eliminates credit.
Prerequisite: Auditions.

Fall and Spring, 1 credit

D. Lawton

MUS 116 University Band

Study and performance of works from the repertory of the concert band. More than

four unexcused absences from rehearsals eliminates credit.
Prerequisite: Auditions.

Fall and Spring, 1 credit

S. Karasick

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

Staff

MUS 229 Music of the Baroque

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 or permission of instructor.

Spring, 3 credits. Not offered 1973-74.

MUS 231 Music in the Romantic Era

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 or permission of instructor.

Spring, 3 credits. Not offered 1973-74.

MUS 232 Music and Drama

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 or permission of instructor.

Spring, 3 credits. Not offered 1973-74.

MUS 233 The Music of Beethoven

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 or permission of instructor.

Fall, 3 credits

E. A. Bonvalot

MUS 234 Music of the 20th Century

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 or permission of instructor.

Spring, 3 credits

L. Starr

MUS 243, 244 The Structural Principles of Music I, II

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 243 may be taken alone.
Prerequisite: MUS 119 or permission of instructor.

Fall and Spring, 3 credits each semester. Not offered 1973-74.

II. Courses Primarily for Music Majors

MUS 114 University Chorus

Study and performance of a repertory from the Middle Ages to the present.
More than four unexcused absences from rehearsals eliminates credit.
Prerequisite: Auditions.

Fall and Spring, 1 credit

MUS 115 University Orchestra

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.
Prerequisite: Auditions.

Fall and Spring, 1 credit
D. Lawton

MUS 116 University Band

Study and performance of works from the repertory of the concert band. More than four unexcused absences from rehearsals eliminates credit.
Prerequisite: Auditions.

Fall and Spring, 1 credit
S. Karasick

MUS 121 Foundations of 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.

Fall and Spring, 3 credits
Staff

MUS 122 Foundations of 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.

Fall and Spring, 3 credits
Staff

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 127, 128 Tonal Harmony I, II

Practice in homophonic writing, including the harmonization of chorales.
Prerequisite: MUS 125.

Fall and Spring, 3 credits each semester
Staff

MUS 143 Western Music Before 1600

The history of western music from antiquity to the late 16th century.
Prerequisite or corequisite: MUS 122.

Fall, 3 credits
P. Wolf

MUS 144 Western Music from 1600 to the Early 19th Century

A survey of style and form from early opera through the late quartets of Beethoven.
Prerequisite: MUS 143.

Spring, 3 credits
P. Wolf

MUS 145 Collegium Musicum

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.
Prerequisite: MUS 122 or permission of instructor.

Fall and Spring, 1 credit
R. Kramer

MUS 151 Basic Piano

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.
Prerequisite: Permission of instructor.

Fall and Spring, 1 credit
Staff

MUS 161 to 199 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.
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 167 Violin—P. Zukofsky
MUS 168 Viola—J. Dupouy
MUS 169 Cello—B. Greenhouse, T. Eddy
MUS 170 String Bass—A. Brehm
MUS 174 Flute—S. Baron
MUS 175 Oboe—R. Roseman
MUS 176 Clarinet—D. Glazer, J. Kreiselman
MUS 177 Bassoon—A. Weisberg
MUS 183 Horn—R. Froelich
MUS 184 Trumpet—R. Anderson
MUS 185 Trombone—S. Karasick
MUS 186 Tuba—S. Karasick
MUS 191 Percussion—R. Des Roches
MUS 199 Voice—A. Addison

MUS 201 Analysis of Tonal Music

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 128.

Fall and Spring, 3 credits
I. Nemiroff (Fall), Staff (Spring)

MUS 203 Analysis of 20th Century Works

Music to be studied will be selected from representative works by Debussy, Bartok, Schoenberg, Stravinsky, Webern and others.
Prerequisite: MUS 201.

Fall and Spring, 3 credits
L. Starr (Fall), Staff (Spring)

MUS 205 Analysis of Medieval and Renaissance Works

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 128.

3 credits. Not offered 1973-74.

MUS 211 Modal Counterpoint II

Counterpoint in 16th century style for three or more voices.
Prerequisite: MUS 125.

Spring, 3 credits. Not offered 1973-74.

MUS 213 Tonal Counterpoint

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 128.

Fall, 3 credits
J. Lessard

MUS 219 Beginning Composition

Individual projects in composition, discussed and criticized in class. Enrollment limited to eight.
Prerequisite: Permission of instructor.

Fall and Spring, 3 credits
P. Winkler and Staff

MUS 249 Western Music of the 19th and 20th Centuries

A survey of music from the early 19th century until the present day with emphasis on major currents of stylistic development.
Prerequisite: MUS 144.

Fall, 3 credits
S. Fuller

MUS 259 Chamber Music (Secondary)

Ensembles formed by students enrolled in secondary instrument or voice, receiving approval of a faculty instructor and assignment of a repertory, will rehearse two hours a week under the supervision of a graduate trainee.
Prerequisite: Permission of instructor.

Fall and Spring, 1 credit

T. Eddy and Staff

MUS 261 to 299 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.
Prerequisites: Audition and permission of instructor.

Fall and Spring, 4 credits

MUS 261 Piano—M. Canin, G. Kalish
MUS 267 Violin—P. Zukofsky
MUS 268 Viola—J. Dupouy
MUS 269 Cello—B. Greenhouse, T. Eddy
MUS 270 String Bass—A. Brehm
MUS 274 Flute—S. Baron
MUS 275 Oboe— R. Roseman
MUS 276 Clarinet—D. Glazer, J. Kreiselman
MUS 277 Bassoon—A. Weisberg
MUS 283 Horn—R. Froelich
MUS 284 Trumpet—R. Anderson
MUS 285 Trombone—S. Karasick
MUS 286 Tuba—S. Karasick
MUS 291 Percussion—R. Des Roches
MUS 299 Voice—A. Addison

MUS 303 Fugue

Application of the skills of tonal counterpoint to fugal composition.
Prerequisite: MUS 213.

3 credits. Not offered 1973-74.

MUS 305 Orchestration

The possibilities and limitations of the commonly used instruments. Conventions of notation. Practice in scoring for various ensembles.
Prerequisite: MUS 128.

Spring, 3 credits

J. Lessard

MUS 313 Composition

Open only to students demonstrating sufficient aptitude and capacity for original work.
Prerequisite: Permission of instructor.

Fall and Spring, 3 credits

J. Lessard and Staff

MUS 314 Chamber Chorus

Performance of works for small chorus. Repertory to be chosen from all periods.
Prerequisites: Audition and permission of instructor.

Fall and Spring, 1 credit

MUS 316 Choral Conducting

Manual technique and the analysis and preparation of vocal scores for performance.
Prerequisites: MUS 128 and permission of instructor.

Fall, 3 credits

Staff

MUS 318 Orchestral Conducting

Baton technique and the analysis and preparation of orchestral scores for performance.
Prerequisites: MUS 316, 305 and permission of instructor.
Corequisite: MUS 305, optional.

Spring, 3 credits

D. Lawton

MUS 319 Chamber Music (Primary)

Chamber music ensembles such as the string quartet, solo vocal ensemble, piano trio, piano duo and other ensembles, including the mixed groupings characteristic of the 20th century. Each meet one hour per week under the direction of a member of the performance faculty for the study and preparation of works from the repertories of the respective groups. The work of the course is normally directed toward the performance of the compositions studied. Open only to students with adequate preparation in their primary instrument or voice.
Prerequisite: Permission of instructor.

Fall and Spring, 2 credits

MUS 321, 322 Piano Literature I, II

(Now offered as MUS 575)

MUS 323, 324 Violin Repertory I, II

(Now offered as MUS 575)

MUS 325 Vocal Repertory

Performance and analysis of works from the vocal repertory.

Fall and Spring, 2 credits

A. Addison

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 143.

Spring, 3 credits

E. A. Bonvalot

MUS 345 Classical Chamber Music

The string quartets of Haydn, Mozart and Beethoven provide a central point of reference in the course.
Prerequisites: MUS 128, 144.

3 credits. Not offered 1973-74.

MUS 347 Johann Sebastian Bach

A study of selected vocal and instrumental works.
Prerequisites: MUS 128, 144.

Spring, 3 credits

P. Wolf

MUS 348 Dramatic Music of the Baroque

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 128, 144.

3 credits. Not offered 1973-74.

MUS 350 Mozart

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 128, 144.

3 credits. Not offered 1973-74.

MUS 351 Beethoven

Works of differing scope and medium drawn from every period of his life will be studied.
Prerequisites: MUS 128, 144.

Fall, 3 credits

R. Kramer

MUS 354 Orchestral Music of the 19th Century

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 128, 249.

3 credits. Not offered 1973-74.

MUS 356 19th Century Opera

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 128, 249.

Fall, 3 credits

D. Lawton

MUS 357 The Lied from Schubert to Wolf

This course explores a peak of German tradition in the matching of text and music.
Prerequisites: MUS 128, 249.

3 credits. Not offered 1973-74.

MUS 362 The Generation of 1830

Chopin, Schumann, Liszt, Mendelssohn and Berlioz, including their stylistic sources in earlier music and influence on later generations.
Prerequisites: MUS 128, 249.

3 credits. Not offered 1973-74.

MUS 363 Stravinsky

The changing stylistic manners adopted by a pivotal composer of the 20th century.
Prerequisites: MUS 128, 249.

3 credits. Not offered 1973-74.

MUS 364 Schoenberg, Berg, Webern

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 128, 249.

Spring, 3 credits. Not offered 1973-74.

MUS 367 Major 20th Century Composers

An intensive study of one or more of those composers who have shaped the musical language of our epoch. The topic for 1973-74 will be Bartok.
Prerequisites: MUS 128, 249.

Spring, 3 credits
L. Starr

MUS 369 Music Since 1945

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 128, 249.

3 credits. Not offered 1973-74.

MUS 391 African Music—Its Theory and Practice

The course is aimed at bringing an understanding of the music of the peoples of sub-Saharan Africa from a study of its qualities and an analysis of its theoretical peculiarities with special reference to form, rhythm, melody and scales, harmony, instrumentation and performance techniques.
Prerequisite: MUS 122 or permission of instructor.

Spring, 3 credits
L. Ekwueme

MUS 399 Independent Project

Individual study under the guidance of a staff member leading to a major essay or composition.
Prerequisites: Permission of instructor and approval of department's Undergraduate Studies Committee.

Fall and Spring, 1 to 4 credits
J. Lessard in charge

DEPARTMENT OF PHILOSOPHY

Distinguished Professor: BUCHLER

Professors: GELBER, HEELAN *(Chairman)*, IHDE, STERNFELD, TEJERA, ZYSKIND

Associate Professors: DILWORTH, SLOTE, SPECTOR, WATSON, ZEMACH

Assistant Professors: BENFIELD, A. DALLERY, C. DALLERY, DE NICOLAS, HILL, HOWARD

Instructor: ALLISON

Lecturer: ACKLEY

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:

A. Study within the area of the major	*Credits*
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 IV. Two courses relating philosophy to particular disciplines	6
Category III. One course defined in terms of a particular style, approach, movement or tradition	3
Category V. One course devoted to a single philosopher or text	3
Two additional courses chosen from any of the five categories	6
Senior seminar, PHI 395 Seminar X	1
	31

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 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 adviser. 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.

Philosophical Retreat

A weekend long, off-campus gathering of junior and senior level philosophy majors and the philosophy faculty in which the philosophical dimensions of a theme will be explored, and the pursuit of wisdom celebrated appropriately in noninstitutional surroundings.

COURSES IN PHILOSOPHY

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 many 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)

Readings and discussions on three topics concerning man: man's identity; man's understanding; man's values.

Fall and Spring, 3 credits

R. Sternfeld

PHI 101 Ancient and Medieval Philosophic Classics (I)

Readings and discussions of major philosophic texts of ancient and medieval philosophers such as Plato, Aristotle, Cicero, Marcus Aurelius, Plotinus, Lucretius, St. Augustine, St. Thomas.

Spring, 3 credits

Staff

PHI 102 Modern Philosophic Classics (I)

Readings and discussions of selected philosophic texts from the 17th century to the present by such philosophers as Descartes, Hume, Kant, Hegel, Nietzsche, Wittgenstein and Sartre.

Fall, 3 credits

Staff

PHI 103 Philosophic Problems (II)

A philosophical inquiry into one or more of the basic problems of philosophy.

Fall and Spring, 3 credits

E. Erwin

PHI 104 Contemporary Morality (IV)

Introductory inquiry into moral questions raised by contemporary personal and social issues such as the justification of social protest, the right to complete sexual freedom, and the morality of new life styles. The student will be expected to master methods of philosophical inquiry and analysis and to apply them to the moral questions under discussion.

Fall and Spring, 3 credits

D. Benfield, M. Slote

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, 3 credits

C. Dallery

PHI 106 Radical Thought (IV)

A systematic historical and critical introdduction 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

R. Howard

PHI 108 Contemporary Philosophical Sensibilities (III)

A range of philosophic problems will be presented through contemporary philosophers representing different sensibilities or styles of philosophic reasoning. The focus of interest will be on the diverse ways in which philosophic problems are raised and treated. The course will be organized around a set of appropriate readings.

Spring, 3 credits

P. Heelan

PHI 109 East and West: A Comparative Philosophical Inquiry (III)

(Formerly PHI 305)

This course surveys the ontologies of classical western writers (Plato and Aristotle) and of the classical Confucian, Taoist and Buddhist traditions. Against that background one major representative of the east (e.g., Nishida Kitaro) and one major representative of the west (e.g., Heidegger) will be studied in detail.

3 credits

W. Watson, D. Dilworth

PHI 114 Introduction to Metaphysics (II)

An introduction to some of the main topics of metaphysics—for example, mind and matter, appearance and reality, freedom and determinism.

Fall, 3 credits

E. Zemach

PHI 118 The Uses of Philosophy (IV)

Introductory study of the bearing of philosophic considerations on the special arts and sciences.

Fall, 3 credits

Staff

PHI 161 Introduction to Symbolic Logic (II)

The emphasis in the first course in logic is on the development of systematic techniques for assessing the validity of arguments: truth tables and truth value analysis, Venn circles, elementary quantification theory and deduction in both the propositional calculus and quantification theory.

Fall and Spring, 3 credits

Staff

Intermediate Level Courses

PHI 200 Ancient Philosophy (I)

Study of the major thinkers from Thales to Aristotle.
Fall, 3 credits

A. Dallery, V. Tejera

PHI 201 Hellenistic and Roman Philosophy (I)

Study of representative writings of Stoicism, Epicureanism, Skepticism and Neo-Platonism.

Fall, 3 credits. Not offered 1973-74.

PHI 202 Greek Life and Thought (I)

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 carefully 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 CLS 350.

Spring, 3 credits

V. Tejera

PHI 204 Medieval Philosophy (I)

Study of the writings of major thinkers from Augustine to William of Ockham.

Spring, 3 credits

W. Watson

PHI 206 Modern Philosophy (I)

The shifting relationships between philosophy and science which characterize the modern period 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.

Fall, 3 credits

M. Spector

PHI 208 19th Century Philosophy (I)

Study of major representative figures of the 19th century such as: Hegel, Schopenhauer, Marx, Mill, Nietzche, Kierkegaard, Spencer and Comte.
Prerequisite: Sophomore standing and/or one course in philosophy.

Spring, 3 credits

A. Dallery

PHI 210 Introduction to Indian Philosophy: Classical Texts (III)

This course is centered on the fundamental themes which emerge from the classical texts of India. It will cover from the Rig Veda to the Gita (2500 B.C. to 400 B.C.), including such other texts as the Upanishads, Buddhism and Yoga.
Prerequisite: Sophomore standing and/or one course in philosophy.

Fall, 3 credits

A. De Nicholas

PHI 211 Introduction to Indian Philosophy: Philosophical Schools (III)

This course is a continuation of PHI 210 but may be taken independently of 210. It carries the student through the systematic philosophies of India. Such philosophies as Carvaka, Madhyamika Buddhism, Mimamsa, Nyaya-Vaiseshika, Samkhya Yoga and Vedanta are here examined with emphasis on such presuppositions as freedom, causality, language, etc., which are implicit in them. (100 A.D. to 1400 A.D.)
Prerequisite: Sophomore standing and/or one course in philosophy.

Spring, 3 credits

A. DeNicholas

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.

Fall, 3 credits
Staff

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 multiple assumptions of the artist and for the basis they offer for critical judgments.

Fall, 3 credits
V. Tejera

PHI 214 Philosophy of Literary Form (IV)

Study of the philosophic bases of such literary concepts as tragedy and comedy and of their relevance to practical experience and history. Such authors are read as Aristotle, Hume, Kant, Nietzche, Bergson, and Unamuno.
Prerequisite: Sophomore standing.

Spring, 3 credits
Staff

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.

Schedule to be announced, 3 credits each semester
Staff

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.

Schedule to be announced, 3 credits
Staff

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 social science and one course in philosophy.

Fall, 3 credits
Staff

PHI 222 Philosophical Foundations of 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.

Spring, 3 credits
Staff

PHI 226, 227 Basic Moral Philosophies (IV)

The major ethical viewpoints in western philosophy. Various conceptions of goodness, rightness, human norms and human goals will be discussed both theoretically and in their significance for recurrent social crises. Readings to be chosen from

such philosophers as Plato, Aristotle, the Epicureans, the Stoics, Augustine, Hobbes, Kant, Mill, Kierkegaard, Bradley, Royce, Santayana, Hartmann, Dewey; and from several non-philosophic sources.
Prerequisite: Sophomore standing.

Fall and Spring, 3 credits each semester

J. Buchler

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.

Fall, 3 credits

D. Dilworth

PHI 231 Philosophy of Perception (IV)

An inquiry into the philosophical problems pertaining to the sensing, perceiving and observing of the world. Various historial solutions (e.g., phenomenalism, 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.

Spring, 3 credits

D. Ihde

PHI 234 Search for a Perfect Science in the West (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 permission of instructor.

Spring, 3 credits

P. Heelan

PHI 235 Philosophy of Science: Concepts (IV)

An inquiry into the function of philosophic 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) or permission of instructor.

Spring, 3 credits

Staff

PHI 236 Philosophy of Science: Structure (IV)

A systematic study of some central problems in the methodology of the sciences. The focus is on the general structure of scientific knowledge.
Prerequisites: Two semesters of philosophy (PHI 161 is recommended) or permission of instructor.

Fall, 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, 102, or 103.

Fall, 3 credits

M. Slote

PHI 238 Indian Buddhism: Its Essence and Development (III)

The analysis of the basic tenets of Buddhism with the added corollaries of language, space and time, as brought out by the different philosophical Buddhist systems, will be the main aim of this course.
Prerequisite: PHI 210.

Spring, 3 credits

A. de Nicholas

PHI 239 Chinese and Japanese Buddhism (III)

The course will trace the main philosophical and institutional stages of Chi-

nese 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 241 Philosophy of Rhetoric (IV)

The nature and role of philosophic principles in determining various theories of rhetoric and propaganda are studied, with attention to the relation of rhetoric to political strategy, psychological manipulation and literary devices. Such authors are read as Plato, Aristotle, Francis Bacon, Cicero, Machiavelli and I. A. Richards.
Prerequisite: Sophomore standing.

Schedule to be announced, 3 credits
Staff

PHI 242 Concepts of Equality (IV)

(Formerly PHI 141)

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.

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: One course in philosophy.

Spring, 3 credits
A. Dallery, C. Dallery

PHI 247 Existentialism (III)

Study of origins and relevance of contemporary existentialist philosophers. The implications for modern thought of Kierkegaard, Nietzsche, Buber, Marcel, Jaspers and Sartre will be examined.
Prerequisites: Sophomore standing and one course in philosophy.

Fall and Spring, 3 credits
A. Dallery and Staff

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, 102, or 103 or permission of instructor.

Spring, 3 credits
Staff

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. This course is identical with CLT 221.

Prerequisite: One course in philosophy and/or sophomore standing.

Schedule to be announced, 3 credits

Staff

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.

Fall, 3 credits

S. Ackley

PHI 291, 292 Individual Systems of the Great Philosophers (V)

A detailed study of the works of a single great philosopher.
Prerequisites: Sophomore standing and one course in philosophy or permission of instructor.

Fall and Spring, 3 credits each semester

D. Allison (291), D. Dilworth (292)

PHI 293, 294 Analysis of Philosophic Texts (V)

Detailed analysis of a major philosophic text.
Prerequisites: Sophomore standing and one course in philosophy or permission of instructor.

Fall and Spring, 3 credits each semester

E. Zemach

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, or permission of instructor.

Spring, 3 credits

Staff

PHI 303 The Surrounding World: Philosophy and Environment (IV)

A systematic study of how human beings experience the surrounding world of life-space, 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.

Schedule to be announced, 3 credits

A. Dallery

PHI 307, 308 Japanese Philosophy and Aesthetics (III)

(Formerly PHI 304)

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

PHI 310 Contemporary Philosophies of Experience (II)

This course is a study of recent philosophies which have made important contributions to the study of the concept of experience. Works from such thinkers as Dewey, Bradley, Husserl, James, Whitehead, Bergson, Sartre, Santayana, Heidegger will be used.
Prerequisite: PHI 206.

Spring, 3 credits

H. Zyskind

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
W. Watson

PHI 312 Studies in Dialectical Thought (III)

A study in the development of dialectical thought from its philosophic origins to its use in various of the contemporary social sciences. A critical examination of dialectical thought represented by some of the following will be made: Plato, German idealism from Kant to Hegel, the Left Hegelians including Marx, Lukacs, Korsch, Gramschi, the Frankfurt School and Sartre. Relations of dialectical thought to the work of Freud, Weber, Levi-Strauss and Mannheim will be noted.
Prerequisite: PHI 106 or two other courses in philosophy.

Fall, 3 credits
R. Howard

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.

Spring, 3 credits
D. Allison

PHI 315 American Philosophy (III)

An evaluation of the major contributions made in the golden age of American philosophic thought as reflected in the works of such figures as William James, Josiah Royce, C. S. Peirce, George Santayana, G. H. Mead, Alfred N. Whitehead and John Dewey.
Prerequisite: PHI 206 or permission of instructor.

Spring, 3 credits
Staff

PHI 316 The Structure of Controversy (II)

A sustained inquiry into the nature and patterns of persistent disagreements and into the capacity of reason to deal with them. Focus is on the obstacles blocking communication and the development of genuine understanding. Extensive opportunities will be provided to participate in outside-class dialogues so that the student may apply and develop the insights of the course in practical situations.
Prerequisite: PHI 108, or 110, or 218, or 219, or 234, or 241; or junior standing and two courses in philosophy.

Spring, 3 credits
Staff

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.

Spring, 3 credits
Staff

PHI 318 The Philosophical Methodology of the Rig Veda (V)

This course aims at bringing out what the Rig Vedic composers had in mind, i.e., the need to structure experience; the different forms of these structures; the dynamism of insight generated by contrasting structures; and the efficient-continuous-viewpoint which mounting insights produce.
Prerequisites: PHI 210 or two courses in philosophy, Oriental history, anthropology, psychology, or sociology.

Fall, 3 credits
A. de Nicholas

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

E. Erwin

PHI 321 Philosophic Bases of Argument (II)

An inquiry into how principles affect or determine the structure as well as content 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 218 or 219 or 241 or 316 or three courses in philosophy.

Fall, 3 credits

H. Zyskind

PHI 322 The Philosophy of Modern Physics (IV)

Investigation of the historical development, logical structure and interpretation of quantum mechanics; its relation to classical physics; the Interdeterminacy Principle; context and sentential logic; measurement and the subject-object relation. Also the investigation of the historical development, logical structure and interpretation of the special theory of relativity; simultaneity; causality; group invariances.
Prerequisites: One philosophy course and two years of college physics.

Spring, 3 credits

P. Heelan

PHI 323 20th Century Anglo-American Philosophy (III)

A survey of main themes of Anglo-American philosophical thought in the 20th century. Focus primarily on metaphysical and epistemological problems, such as: knowledge of an external world, logical atomism, philosophical "analysis," the problem of universals, etc. Philosophers to be discussed will include: Moore, Russel, Lewis, Ayer, Austin and others.
Prerequisites: Nine hours of philosophy, including PHI 161 and PHI 206.

Fall, 3 credits

Staff

PHI 324 European Philosophical Criticism (IV)

An analysis and interpretation of recent trends in contemporary European thought, including structuralism, neo-Freudianism, new criticism, as well as later phenomenology. Discussion will also relate to the philosophical implications of literature, aesthetics, anthropology and linguistics. Readings will include Levi-Strauss, Foucault, Lacan, Deleuze, Barthes, Butor, Levinas, Ricoeur and Merleau-Ponty.
Prerequisites: Two courses in philosophy.

Spring, 3 credits

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.

Schedule to be announced, 3 credits each semester

L. Gardner (345), E. Hedley (346)

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

Staff

PHI 394 Seminar in Individual Projects

An upper-level seminar, the content of which will be determined by the projects which the students wish to develop. Purpose of seminar is to assist the student to develop his ideas through periodic written presentations of his work-in-progress to the other students of the seminar. Students may choose topics from among the following fields: ethics, aesthetics, metaphysics, social and political philosophy, the history of philosophy or the philosophies of science, religion, man and law. Prerequisites: Five successfully completed philosophy courses.

Fall and Spring, 3 credits

Staff

PHI 395 Seminar X

An informal seminar conducted in connection with the Philosophy Club for majors only. The seminar will bring to focus the philosophical interests which the students have acquired and will develop the students' capacities for philosophical discussion. Neither the form nor the content of the seminar is determined in advance, but will be a function of the interests of the participants from whom the principal initiatives will come.
Prerequisites: Philosophy major standing, with at least five successfully completed philosophy courses.

Fall and Spring, 1 credit

D. Ihde

PHI 397 Readings and Research in Methodology (Normally III)

Advanced level inquiry with individualized instruction in one particular philosophical style of reasoning. Consult undergraduate adviser for specific details.
Prerequisites: Senior philosophy major standing and permission of department.

Fall and Spring, 1 to 6 credits

Staff

PHI 398 Readings and Research in the Uses of Philosophy (Normally IV)

Advanced level inquiry with individualized instruction in the application of philosophical tools to one of the special disciplines. Consult undergraduate adviser for specific details.
Prerequisites: Senior philosophy major standing and permission of department.

Fall and Spring, 1 to 6 credits

Staff

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 adviser for specific details.
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 department chairman. Please consult the bulletin boards outside the departmental offices for course descriptions and prerequisites.

PHYSICAL EDUCATION

Associate Professors: RAMSEY, L. THOMPSON *(Chairman)*, VON MECHOW

Assistant Professors: DUDLEY, K. LEE, SMOLIAK, SNIDER

Instructors: COVELESKI, CROSS, DUDZICK, HIGASHI *(Part-time)*, [a]HUTTON, LUKEMIRE *(Part-time)*, MORI *(Part-time)*, WEEDEN

Physical Education Requirement

The university physical education requirement is that each undergraduate student, if not officially exempted, must satisfactorily complete two semesters of physical education courses. The requirement can also be fulfilled, in whole or in part, by participation in intercollegiate athletics. Although the student may choose any two semesters to complete the requirement, it is advisable to do so before the end of the sophomore year.

The physical education department awards 50 points for each successfully completed semester course in physical education and for each semester of satisfactory participation in an intercollegiate sport. A total of 100 points represents satisfactory completion of the physical education requirement. Only Pass/No Credit grades are given for physical education courses. The grade is determined by evaluating the student's attendance and attitude during the semester. Awarding of 50 points for participation in an intercollegiate sport is based upon attitude and attendance during practice and games.

COURSES IN PHYSICAL EDUCATION

Physical education courses for men are indicated as PEM; courses for women are PEW; those courses that are co-educational are PEC. These courses aim to develop knowledge, understandings and skills as well as strategy and social behaviors of a sport or dance activity selected by the student from a wide range of offerings. Unless otherwise indicated, courses are offered in both fall and spring semesters, but the appropriate class schedules should be consulted for details.

Individual and Team Sports

Courses will consist of two or three sports as scheduled by the Physical Education Department according to the availability of staff and facilities. Instruction will include the techniques, rules, strategy and social behaviors involved in team and individual sports activities. Selections will include the following: archery, badminton, baseball, basketball, fencing, field hockey, golf, gymnastics, handball, karate, paddle-ball, physical conditioning, soccer, softball, squash, tennis, touch football, track and field, volleyball, weightlifting.

PEM, PEW 100 Golf/Squash
PEM, PEW 101 Paddleball/Squash
PEM, PEW 102 Badminton/Squash/Paddleball
PEM, PEW 103 Squash/Tennis
PEM 104 Handball/Squash/Paddleball

[a] On leave academic year 1973-74

PEC 106 Basic Karate (M. Mori)
PEC 107 Intermediate Karate (M. Mori)
PEM, PEW 108 Judo*
PEM, PEW 109 Self Defense*
PEC 110 Horseback Riding*
PEC 111 Intermediate Equitation*
PEC 112 Bowling*
PEC 113 Basic Fencing*
PEC 114 Intermediate Fencing*
PEM, PEW 140 Basketball/Softball
PEM, PEW 141 Volleyball/Softball
PEM 142 Soccer/Volleyball
PEM 143 Touch Football/Basketball
PEM 144 Basketball/Track & Field
PEM 145 Touch Football/Volleyball
PEW 146 Field Hockey/Volleyball
PEC 150 Archery/Badminton
PEM, PEW, PEC 151 Tennis/Badminton
PEM, PEW, 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 160 Archery*
PEC 161 Tennis*
PEC 163 Recreational Games*

PEM, PEW 108 Judo

Separate courses for men and women in the instruction and practice of the fundamentals of judo: breakfalls, throws and grappling techniques. Limited application of skills to competitive randori (sparring) and shiai (contest). PEW 108 is adapted to the special needs and capacities of young women.

N. Higashi

PEM, PEW 109 Self-Defense

(Formerly PEM, PEW 107)

Separate courses for men and women in the instruction and practice of basic self-defense techniques of judo, aikido and jujitsu. PEW 109 is adapted to the special needs and capacities of young women.

N. Higashi

PEC 110 Horseback Riding (Equitation)

This course is designed to equip students at the beginner level with the theory and practical application of equitation. This course meets for a double period (2½ hours) once a week and a special fee of $45 is necessary for enrollment.

G. Lukemire

PEC 111 Intermediate Equitation

Riding techniques covering basic dressage and jumping, including stadium jumping and riding hunter courses. An introduction to stable management, including the training of young horses.
Prerequisite: PEC 110 or permission of instructor.

G. Lukemire

PEC 112 Bowling

A basic course in bowling including rules, scoring and basic techniques of the game. Bowling fees will be paid by the students at the conclusion of each class.

PEC 113 Basic Fencing

(Consult department for details.)

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.

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* See course description below.

GYMNASTICS

PEW 115 Movement Fundamentals

(Formerly PEW 133)

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.

C. Cross

PEC 116 Tumbling and Trampolining

(Formerly PEC 139)

Basic through intermediate tumbling and trampolining, including dual stunts, balancing and pyramid building for men and women.

C. Cross

PEC 117 Basic Gymnastics

(Formerly PEW 140)

A basic course covering the four olympic pieces: free exercise, uneven parallel bar, horse and balance beam.

Fall

C. Cross

PEW 118 Intermediate Gymnastics

(Formerly PEW 141)

An intermediate course covering the four olympic pieces, including adaptation of techniques in compositional performances.

Spring

C. Cross

SWIMMING AND WATER SAFETY

PEC, PEM, PEW 120 Basic Swimming

Separate as well as co-educational courses for men and women designed to equip students at the beginner level with basic swimming skills and knowledge. (See also PEC 128.)

PEC 121 Intermediate Swimming

A co-educational course designed to equip the novice swimmer with more advanced strokes and water skills.

PEC 122 Advanced Swimming and Life Saving

A course designed to equip the student with advanced strokes, life saving and water safety skills. A prerequisite is demonstration of a skill level necessary for participation in this course.

PEC 123 Water Safety Instructor

This course is designed to help the student meet the requirements for certification as a Red Cross water safety instructor.
Prerequisite: PEC 122 or equivalent.

PEC 124 Synchronized Swimming

Synchronized swimming, individual and group techniques including routine composition and participation.

L. Hutton

PEC 125 Aquatic Sports

Instruction and practice in water sports, including such areas as water basketball, water polo, stunts and recreational games.
Prerequisite: PEM 121 or equivalent.

H. von Mechow

PEC 126 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 123 Water Safety Instructor or permission of instructor.

H. von Mechow

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. Prerequisite: Swimming proficiency acceptable to instructor.

K. Lee

PEC 128 Basic Swimming for Non-Swimmers

Basic swimming course limited to non-swimmers.
(See also PEC 120)

DANCE

PEC 130 Beginning Modern Dance

A study of the fundamentals of modern dance, including an analysis of movement, conditioning techniques and simple compositional forms.

B. Dudley

PEC 131 Intermediate Modern Dance

(Formerly PEC 134)

Development of modern dance techniques and movement awareness.
Prerequisite: PEC 130 or permission of instructor.

B. Dudley

PEC 132 Advanced Modern Dance

(Formerly PEC 138)

Modern dance techniques on an advanced level, including work in dance composition.
Prerequisite: PEC 130 or permission of instructor.

B. Dudley

PEC 133 Dance Technique and Composition I

A study of advanced dance techniques and beginning dance composition.

B. Dudley

PEC 135 Folk and Social Dance

(Formerly PEC 138)

A basic course in dance divided into two phases, folk and social dance. Course will include traditional American and European folk dances and the fundamentals of ballroom dancing.

Spring
B. Dudley

PEC 138 Dance Teaching Methods for Elementary School Teachers

(Formerly PEC 135)

A study of the teaching methods and materials used for teaching dance for ages 6-13. Simple body-building techniques and methods to develop freedom of expression and therapeutic values.

B. Dudley

PHYSICAL CONDITIONING

PEC 139 Physical Education in the Elementary School

(Formerly PEC 104)

A course to help prospective classroom teachers conduct physical education activities for the first six grades. The course will include the responsibilities of the classroom teacher in meeting the needs of the elementary child in an activity program.

PEM 147 Physical Conditioning

(Consult department for details.)

PEM 148 Weight Training

(Formerly PEM 106)

A basic course in weight training using aerobic and anerobic activities to improve physical strength, appearance and range of movement through the use of various types of weight training equipment and individualized counseling.

PEM 149 Weightlifting

(Formerly PEM 109)

A basic course in the techniques and fundamentals of weightlifting, exercises for specific muscle groups and development of personal work-out schedules.

PEC 160 Archery

(Formerly PEC 136)

A comprehensive course in the history, nomenclature of equipment, basic rules and fundamental skills of archery for men and women.

PEC 161 Tennis

(Formerly PEC 137)

A comprehensive course in the basic rules, fundamentals and playing strategy in the sport of tennis for men and women.

PEC 163 Recreational Games

Course designed to acquaint the student with a variety of leisure time recreational activities such as boccie, table tennis, pool, kite flying, horseshoes, croquet, deck tennis and shuffle board, Frisbee, broom hockey and others.

DEPARTMENT OF PHYSICS

Professors: O. AMES *(Chairman)*, [a]ARIMA *(Visiting)*, BALAZS, BLUME, G. E. BROWN, COURANT, DRESDEN, EISENBUD, FEINGOLD, FINOCCHIARO, FOSSAN *(Director of Graduate Program)*, D. FOX, M. GOLDHABER *(Adjunct)*, M. L. GOOD, KAHN, KAO, KIRZ, KUO, LAMBE, [a]B. W. LEE, L. L. LEE, MUETHER *(Director of Undergraduate Program)*, NATHANS, PAUL, POND, SILSBEE, STRASSENBURG, SWARTZ, TOLL, WEISBERGER, WILCOX, C. N. YANG *(Einstein Professor)*

[a] On leave academic year 1973-74.

Associate Professors: DEZAFRA, FREEDMAN, A. GOLDHABER, GRAF, GRANNIS, JACKSON, LEE-FRANZINI, MOULD

Assistant Professors: ALLEN, ENGELMANN, FEIBELMAN, LUKENS, R. MCCARTHY, MCCOY, MCGRATH, METCALF, NIEH, PALDY, QUIGG, J. SMITH, [a]SPROUSE, [a]J-M. WANG

A student wishing to major in physics may elect either the research program, the general program or an appropriate combination of the 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

All of these courses must be taken for a letter grade. In addition, we strongly recommend that majors take all physics and math courses for letter grade only.

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 chosen from the junior or senior laboratories.
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 adviser.

Students wishing to major in physics must, at the end of their sophomore year, consult with their departmental advisers 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 adviser's approval.

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[a] On leave academic year 1973-74.

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 recommended. Variations in the program are acceptable with the approval of the student's adviser.

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 Introductory Chemistry
CHE 102 or 104 Introductory Chemistry
(Chemistry may be taken equally well in the sophomore year.)

Sophomore Year

PHY 151 General Physics III
PHY 152 Electromagnetic Theory
PHY 206 Thermodynamics, Kinetic Theory, Statistical Mechanics
MSM 151 or 193 Calculus III or Honors Calculus III
MSM 152 or 194 Calculus IV or Honors Calculus IV

Junior Year

PHY 203 Optics and Waves
PHY 205 Mechanics
PHY 208 Quantum Physics
PHY 336 Topics in Electrodynamics
At least one semester of Junior Lab (PHY 235, 236)
MSI 201* Advanced Calculus for Scientists I
MSI 202** Advanced Calculus for Scientists II

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*Prerequisite for PHY 208, 336 and 343; corequisite for PHY 205.

** Corequisite for PHY 208; prerequisite for PHY 343.

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 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 recommended. Other choices are acceptable with the adviser's approval.

PHY 131, 132 Introductory Physics
PHY 141, 142 Topics in Intermediate Physics
MSM 121, 122 and 151, 152 *or* MSM 191-194
PHY 241, 242 Topics in Modern and Quantum Physics
PHY 321, 322 Advanced Laboratory
PHY 361, 362 Senior Seminar
PHY 301, 302 Contemporary Physics from an Elementary Viewpoint

The Astrophysics Program

A student electing the astrophysics track would take a program of study which satisfies the 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. Those seeking to pursue a graduate or research career are strongly advised to take ESS 242, ESS 244, ESS 381, ESS 382, ESS 383, and ESS 384 in partial fulfillment of the course requirements for the bachelors degree.

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 IN PHYSICS

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

The first semester will be largely a study of mechanics. Emphasis is on the conservation laws and topics will include kinematics and vectors; momentum, force and energy; rotational motion; gravitation and planetary motion; oscillations, wave motion and sound. Use of the calculus will be introduced concurrently with its exposition in MSM 121. A high school physics course is not required background but is desirable. The second semester will be a study of electromagnetism and optics. Topics include the electric field, Gauss's law and electrical potential; currents; the magnetic force, sources of the magnetic field and inductance; oscillations and electromagnetic waves; the nature and propagation of light, interference and diffraction. The laboratory program introduces elementary experimental techniques and provides an opportunity for the observation of the phenomena on which the theory is built. Two lecture hours, two recitation hours (one for the laboratory) and two laboratory hours per week.

Corequisites: MSM 121, 122.

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., magnetohydrodynamic 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. Prerequisites: One year of general physics or permission of the director of the undergraduate 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

PHY 131, 132 Introductory Physics

This course consists of an introductory survey of standard physics topics, arranged for individualized study. All students begin with topics in mechanics, including kinetics, Newton's laws and energy. Most students will study thermodynamics during the first semester and during the second semester will take up topics in 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. Faculty tutors are available to assist students with their independent study. Faculty evaluators administer proficiency tests on each assignment; proficiency on one unit must be demonstrated before the student proceeds to more advanced work. The level of study may range from that of a good high school course to that of a rigorous first-year course for physics majors using calculus. There is one lecture each week on a general physics topic. Laboratory apparatus, library references, taped lectures and film loops are available for student use many hours each week.

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, or permission of the director of the undergraduate program in physics.

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.
Prerequisites: PHY 141 or permission of the director of the undergraduate program in physics.

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 152 Electromagnetic Theory

Electromagnetic phenomena and the elementary equations describing them are reviewed. Vector calculus is introduced and is used to develop these relationships into Maxwell's equations. The transformations of electric and magnetic fields in the special theory of relativity are discussed. Topics studied will include: electrostatic fields, fields of moving charges, magnetic fields, electro-magnetic induction, electric currents and electric and magnetic fields in matter. Three lecture hours and one three-hour laboratory per week.
Prerequisites: PHY 101, 102.
Corequisite: MSM 151.

Fall and Spring, 4 credits

PHY 203 Optics and Waves

A survey of geometrical and physical optics. The basic phenomena of optics—ray optics, interference, diffraction and polarization—will be demonstrated and discussed in terms of the wave theory of light. Applications will be made to the design and performance of optical instruments, crystal optics, lasers and holography. Three class hours per week.
Prerequisites: PHY 152, MSM 151.

Fall and Spring, 3 credits

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, 152.

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, Schroedinger's equation in time dependent and time independent forms, one and three dimen-

sional 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. Prerequisites: PHY 203, PHY 205, MSI 201.

Fall and 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 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 Schroedinger 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 or permission of the director of the undergraduate program in physics.

Fall, 3 credits

PHY 242 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 or permission of the director of the undergraduate program in physics.

Spring, 3 credits

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 super-conductivity, 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 credits each semester

PHY 303 Selected Studies of Urban and Environmental Problems

The seminar is designed to provide the physics major with an overview of a number of outstanding urban and environmental problems and the mathematical and physical methods being currently applied to such problems. Topics include water resource management, health delivery systems, transportation and nuclear safeguards. In addition to attendance at lectures, a term paper on one of the subjects covered or a related topic will be a course requirement.
Prerequisites: Mathematics through differential equations and two years of physics and/or chemistry.

Fall, 2 credits

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 208.

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.
Corequisites: PHY 241, 242.

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 and Spring, 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 152, PHY 203, and 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 152, 205, and MSI 201, 202 or permission of the director of the undergraduate program in physics.

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.
Prerequisites: PHY 203, 208, or permission of the director of the undergraduate program in physics.

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 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, or permission of the director of the undergraduate program in physics.

Fall and Spring, 2 credits 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 152, PHY 206, PHY 208, or permission of instructor.

Spring, 3 credits

PHY 391, 392 Research

With the approval of the faculty, a student 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.
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 upperclass 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.
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.

Classical Physics
Quantum Mechanics
Statistical Mechanics
Nuclear Physics
Astrophysics
Solid State Physics
Elementary Particle Physics

DEPARTMENT OF POLITICAL SCIENCE

Professors: KOPPELMAN *(Part-time)*, KOTTLER *(Part-time)*, PESONEN, SCARROW, TANENHAUS, TRAVIS, TURSKY, [a]WILDENMANN, J. C. WILLIAMS *(Chairman)*

Associate Professors: LODGE, MULLER, [a]MYERS

Assistant Professors: CIMBALA, FRIEDLAND, GROFMAN, JACKNIS, MUNK, POOL

Adjunct Professors: DOGAN, REICHLER

Requirements for the Major in Political Science

Students majoring in political science must complete a minimum of 39 credit hours in political science and related areas to be divided as follows:

1. From 24 to 30 credits in political science, at least 18 of which must be at the 200 level or higher;
2. Included in the 18 200-level credits, must be at least one political science course in three of the following four areas: American politics, comparative politics, international relations and political theory and methodology;
3. From nine to 15 credits in related courses in other departments, usually at the 200 level.

Programs of Study

All majors are strongly advised to take each of the four introductory courses: POL 120, 140, 151 and 191. In addition, they should follow the recommendations for the programs of their choice:

Pre-Law

Students planning to attend Law School are advised to take POL 230, as well as at least one additional course relating to American, comparative

[a] On leave academic year 1973-74.

or international law. In addition, they should take POL 271, or a statistics course given by another social science department. Students should consult the university pre-law adviser.

Public Policy, Administration and Planning

Students planning a career in government service should take POL 244, 250, 254 and 256, as well as either POL 271 or a comparable course in statistics offered by another social science department.

International and Public Affairs

Students planning careers in the foreign service, journalism or communications are advised to take POL 221, 225 and courses in political philosophy.

Social Science Research

Students considering graduate work in one of the social sciences should concentrate on POL courses which stress quantitative techniques and the various conceptual approaches to the discipline. They are also advised to take MSA 101 and either MSA 102 or MSA 121; and either ECO 211 or ECO 215. Other courses should be selected after consultation with a faculty adviser.

COURSES IN POLITICAL SCIENCE

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 111 Contemporary Political Problems

Analysis of current and recurrent issues in the politics of civil rights, urban problems, race relations, great power alliances, arms development and control, the Vietnam War and the problems political institutions face in meeting and managing social change. Especially recommended for non-majors.

3 credits

Staff

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

S. Cimbala

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

H. Scarrow

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

Staff

POL 190 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 191 Political Behavior

Survey of the types, modes, and conditions of political activity (political participation, apathy, alienation); political consensus 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 195 Introduction to Mathematical Applications in Political Analysis

(Formerly POL 281)

Basic introduction to the use of finite mathematical structures and stochastic models as tools for political analysis. Applications to organization theory, inequality, ideology, communications networks, etc. High school algebra required; MSA 101 is helpful.

3 credits

B. Grofman

POL 196 Formal Models of Political Choice

(Formerly POL 282)

Basic introduction to the formal study of power and social choice, especially economic and game theory models of social conflict. Applications to coalition theory, committees and elections, bargaining theory, etc. High school algebra required. ECO 211 or ECO 215 would be helpful.

3 credits

B. Grofman

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 students considering advanced work in any of the social sciences.

3 credits

B. Grofman, E. Muller, J. Pool

POL 201 American Political Thought

An analysis of the major policy problems from the Revolution to the present with the aim of discovering the prevailing concerns, methods and spirit of American thought in civic matters.

3 credits

Staff

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.

3 credits

J. Williams

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 BLS 240.

Prerequisites: Two semesters of introductory BLS 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.

Spring, 3 credits

R. Wildenmann

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?

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 nonwestern political process.

3 credits

Staff

POL 210 Politics in 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 BLS 258.

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

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 nonwestern and upon party history, electoral behavior, election campaigns and pressure group activity. Analysis of cross-national public opinion survey data using card sorter.

3 credits

P. Personen, R. Wildenmann

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.
3 credits

F. Myers, H. Scarrow

POL 216 Politics in France and Italy

Examination of the political process in France and Italy. The course will focus on selected problems rather than presenting a country-by-country summary. Emphasis will be placed upon the interplay of institutions, ideas and personalities, as they affect the vitality of democratic politics and the future of Western European unity.

3 credits

F. Myers

POL 218 Politics of Germany and Austria

Study of politics and government of divided Germany and Austria, with emphasis on the social and psychological bases of politics, and their relationship to pressure groups, parties and the working of governmental institutions.

3 credits

R. Wildenmann

POL 219 Revolution and Reform in the Middle East

The Middle East has been the scene of several attempts to make radical social and cultural transformations by political means. This course will examine the fate of both Communist and non-Communist strategies of change in selected areas of the Middle East, including regions which are part of the Soviet Union. The course will also provide an occasion for background reading on Middle Eastern politics and societies, including the political roles of the military and the intelligentsia and the relationship between religion and politics. POL 151 is advised but not required.

3 credits

Y. El-Ayouty

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.

3 credits

D. 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.

3 credits

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.

3 credits

Staff

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.

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.

3 credits

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.

3 credits

S. Cimbala

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.

Fall, 3 credits

M. Reichler

POL 230 Constitutional Law and Politics: United States

A study of the role of the modern Supreme Court within the political and governmental process; its relations 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.

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 Comparative Political Culture and Socialization

Discussion of principal concepts, methods and findings in the related fields of political culture and political socialization. Political learning at all ages.

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.

3 credits

H. Scarrow

POL 235 Regional Organizations in Europe

Analysis of structure and policies of European organizations: EEC, EFTA, Comecon, etc. Problems of European unity and integration, peace settlement and crisis management. Emphasis is given to empirical phenomena in the light of economic, social and political theories.
Prerequisite: POL 151 or permission of instructor.

3 credits

R. Wildenmann

POL 238 Politics in Scandinavia

Analysis of the governmental institutions and political powers and of the functions of democratic political systems in Northern Europe. The course will emphasize cross-national research. Comparisons are made within Scandinavia as well as with other smaller European democracies.
Prerequisite: POL 151 or permission of instructor.

3 credits

P. Pesonen

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.

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 BLS 255.
Prerequisite: Two previous courses in the social sciences or sophomore standing.

Fall and 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.

3 credits

Staff

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 significance of parties and pressure groups for democratic idealogy and the problems of political leadership in a democracy.

3 credits

Staff

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.

3 credits

J. Kottler

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.

3 credits

Staff

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 antipoverty programs.

3 credits

M. Munk

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.

3 credits

M. Munk

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 Estimates; City Council; civil service; taxation and budgeting; selected policy problems, including problems of the metropolitan region.

3 credits

F. Rosenberg

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.

3 credits

N. Jacknis

POL 249 American Federalism and Intergovernmental Relations

A survey of the constitutional, institutional and political interrelationships among federal, state and local governments; covering grant-in-aid and interstate compacts.

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.

3 credits

E. Friedland

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.
Prerequisites: POL 254 and senior standing.

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."

3 credits

N. Jacknis

POL 253 New York State Internship

Advanced students travel to Albany in a group once a week to work a full day as staff members for legislators. Staff assignments will be made so as to insure the compatibility of the student's and legislator's interests, while guaranteeing the students meaningful work.
Prerequisites: Senior standing and permission of instructor and of department.

3 credits

J. Kottler

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.

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.

Fall, 3 credits

Staff

POL 256 The Budgetary Process

Budgetary process at all levels of government. 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.

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 decisions, decision tools, the empirical study of decision making, social criticism and the decisionist perspective.

3 credits

E. Friedland

POL 260 Classical Political Theory: Plato to Mill

Plato, Aristotle, St. Thomas, Machiavelli, Hobbes, Locke, Montesquieu, Hume, Mill, Rousseau are to be read and discussed to the end of discovering their relevance to the understanding of political behavior.

3 credits

Staff

POL 261 Contemporary Political Theory

How has political theory assimilated the advances and discoveries in the other social sciences and developments in the analysis of language and reversals in Hegelianism and anarchism? Original writing from Mosca to Marcuse.

3 credits

J. Williams

POL 263 Utopias

Inquiry into the political bases and purposes of community via exploration of major utopian social models and experiments. Appraisal of the political significance and scientific status of utopian thoughts.

3 credits

E. Friedland

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).

3 credits

J. Williams

POL 271 Introduction to Methods of Political Research

An introduction to the development, use and testing of simple quantitative models of political phenomena and systems. Emphasis is placed on the intelligent application of elementary mathematical-statistical theory. Students will develop their own models and relate the models to relevant political data. Opportunity to use the computer.

Prerequisites: POL 200 and high school algebra.

3 credits

N. Jacknis

POL 272 Advanced Research Methods

Continuation of 271. Analysis of and solutions to various statistical problems that arise in the use and testing of both linear and non-linear quantitative models of political phenomena and systems. Work will be focused on research chosen by each student. Extensive utilization of statistical programs on the computer. Opportunity for experience in various data collection methods.
Prerequisite: POL 271.

3 credits

Staff

POL 275 Political Psychology

Focuses on the relevance of psychological phenomena and the application of general theories of individual human behavior to the study of politics. Consideration of theories of: obedience and influence; political concept and issue formation; perceptual, learning and motivational phenomena as they apply to political behavior.
Prerequisite: Permission of instructor; PSY 219 is helpful but not required.

3 credits

N. Jacknis

POL 276 Experimental Political Behavior

The course will focus on selected topics in political psychology, employ experimental techniques and emphasize psychophysiological measures of response patterns. Laboratory projects will be carried out by students in the department's psychophysiological laboratory.
Prerequisites: POL 191, PSY 101, 102 or permission of instructor.

3 credits

M. Lodge, B. Tursky

POL 299 Directed Readings in Political Science

Individually supervised reading in selected topics of the discipline.
Prerequisites: Permission of department chairman and instructor.

Fall and Spring, 1 to 3 credits

Staff

POL 315 European Politics

Analysis, at an advanced level and in systematic theoretical terms, of the variety of European governmental structures, their interrelationships and the basic issues of constitutional politics.
Prerequisites: POL 151 and one other course in the general area of European politics.

Fall, 3 credits

R. Wildenmann

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.
Prerequisite: POL 230.

Spring, 3 credits

J. Tanenhaus

POL 332 Problems in Constitutional Law and Politics: Comparative

An advanced treatment of the work of constitutional courts in selected countries (e.g., Argentina, Australia, Canada, India, Ireland, Japan, United States and West Germany). A major research paper is required.
Prerequisite: POL 232.

Fall, 3 credits

J. Tanenhaus

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 department.

3 credits each semester

Staff

POL 399 Directed Research

Qualified advanced undergraduates in political science may carry out individual research projects under the direct super-

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. Prerequisite for PSY 102: PSY 101.

Fall and Spring, 3 credits each semester

R. Kestenbaum, S. Weintraub, S. Sternglanz, R. Friend, F. Levine, J. Tweedy

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, 102 and MSM 121 or MSA 101.

Fall and Spring, 3 credits

T. Doll, M. Johnson, H. Morrison, R. Schvaneveldt, J. Tweedy

PSY 199 Experimental Methodology

Problems of experimental psychology: the design and execution of experiments and the relation of experiments and theories in the area of perception, learning and memory, decision making and group interaction.
Prerequisites: PSY 101, 102, 162.
Corequisite: PSY 200.

Fall and Spring, 2 credits

M. Johnson

PSY 200 Experimental Methodology Laboratory

Coordinated with PSY 199 to provide an introduction to experimental methodology as applied to psychological processes.
Prerequisites: PSY 101, 102, 162.
Corequisite: PSY 199.

Fall and Spring, 2 credits

D. Cross

PSY 201 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 invesigated.
Prerequisite: PSY 200.

Fall and Spring, 4 credits

D. Emmerich

PSY 202 Laboratory in Physiological Psychology

Techniques and experimental problems in the neurophysiological correlates of behavior including sensation, perception, motivation, learning and memory.
Prerequisite: PSY 200.

Fall and Spring, 4 credits

R. Kestenbaum, E. Menzel

PSY 203 Laboratory in Personality

Techniques and experimental problems in personality and emotion. Experiments will cover the major propositions from prominent theories of personality.
Prerequisite: PSY 200.

Fall and Spring, 4 credits

J. Geer

PSY 204 Laboratory in Social Psychology

Techniques and experimental problems in social psychology, including natural observation, surveys and experimental design.
Prerequisites: PSY 200, 309.

Fall and Spring, 4 credits

S. Valins

PSY 206 Laboratory in Learning and Performance

Experimental methodology as applied to associative and motivational processes: re-

sponse acquisition and extinction, reward and punishment, discrimination learning, retention, perceptual-motor skills and cognitive processes.
Prerequisite: PSY 200.

Spring, 4 credits

R. Schvaneveldt

PSY 208 Theories of Personality

Contemporary theories of personality with emphasis on the experimental literature pertaining to personality development and current methods of personality assessment 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

D. Bramel, C. Polite, S. Valins

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.

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

H. Kaye, S. Sternglanz, R. Whitehurst

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

R. Kent, A. Ross

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.
Prerequisite: PSY 101, 102 or permission of instructor.

Spring, 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 and Spring, 3 credits

T. Doll, 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 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.

Fall, 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

C. Polite

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.
Prerequisites: PSY 162 and permission of instructor. Not open to students who have taken PSY 209.

Fall, 3 credits

S. Valins

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.
Prerequisite: PSY 213. May be repeated once with permission of instructor.

Fall, 3 credits

A. Ross

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 at least junior 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.

Spring, 3 credits

L. Krasner

PSY 322 Advanced Statistics

Survey of probability and sampling theory, descriptive and inferential sta-

tistics and introduction to experimental design.
Prerequisite: PSY 162 or permission of instructor.

Fall and Spring, 3 credits

H. Morrison

PSY 330, 331 Research in Psychology

Laboratory or field work under the direct supervision of a faculty member in the Department of Psychology.
Prerequisites: Advanced standing in psychology and *written* permission of the faculty supervisor on file in the department.

Fall and Spring, 1 to 3 credits each semester, may be repeated.

Staff

PSY 332, 333 Readings in Psychology

Directed readings under the guidance of a faculty member.
Prerequisites: Major in psychology, senior or junior standing, *written* permission of the faculty supervisor on file in the department.

Fall and Spring, 1 to 3 credits each semester, may be repeated.

Staff

PSY 340 Physiological Psychology

The functions of the primate brain in behavioral processes covering sensation, 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.

Spring, 3 credits

R. Kestenbaum

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 and Spring, 3 credits

J. Tweedy

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 or permission of instructor.

Fall, 3 credits

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 362 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 370 The Psychology of Language

Examination of language and a consideration of its implications for cognitive psychology.

Prerequisites: PSY 101, 102, 219 or permission of instructor.

Fall and Spring, 3 credits

J. Bransford, T. Doll

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

R. Friend, C. Polite

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 or permission of ininstructor.

Spring, 3 credits

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 or permission of instructor.

Fall and Spring, 3 credits each semester. Not offered 1973-74.

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.

Prerequisites: Senior psychology major and permission of instructor.

Fall and Spring, 3 credits

Staff

PSY 391, 392, 393 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. No more than six credits from this series may be offered toward the major requirement.

Prerequisites: PSY 200 and written permission of instructor and the department.

Fall and Spring, 3 credits each semester

Staff

PUERTO RICAN STUDIES PROGRAM

Staff to be announced.

The Puerto Rican studies program, which began offering courses in the fall of 1971, is designed as a series of course offerings dealing with the totality of the Puerto Rican experience.

The dual goal of the program may be defined as the creation of a genuine and viable atmosphere of cultural pluralism, while providing a vehicle for the Puerto Rican student to know himself. Although no major can be offered at present, students may view these courses as complementary to their major and to their career goals.

Note: All of the following PRS courses may be used to fulfill the general university requirement in social sciences except PRS 202.

COURSES IN PUERTO RICAN STUDIES

PRS 101, 102 Civilization and Culture of Puerto Rico I, II

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 each semester

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

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: Sophomore standing.

3 credits

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.
Prerequisites: Six credits in PRS or permission of instructor. May be repeated once.

3 credits

INTERDISCIPLINARY PROGRAM IN RELIGIOUS STUDIES

Chairman: 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 adviser, may combine them in a variety of ways to create a program which meets individuals' 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 course in *either* of the following:	6
A. Symposium in religious studies *or*	
B. Directed study in a special area	
	30

COURSES APPROVED FOR THE PROGRAM IN RELIGIOUS STUDIES

Detailed course descriptions appear under appropriate departmental listings and should be examined there.

ANT 251 Comparative Religious Systems
BLS 211 Comparative African Religions
CLS 115 Classical Mythology
EGL 242 Milton
EGL 261 The Bible as Literature
HIS 204 Medieval History, 300-1100
HIS 207 The Age of Reformation
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 Philosophy: 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
PHI 389 Mysticism and Humanism in Western Philosophy
(Not offered 1973-74)
POL 263 Utopias
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 protestant and radical theology. Prerequisite: RLS 201.

Spring, 3 credits

T. Altizer

RLS 220 Spanish Mystics in Translation

A study of representative figures in the Spanish mystical tradition, such as St. John of the Cross, St. Teresa of Avila and Miguel de Unamuno with special attention to the doctrinaire foundations, philosophical tenets, psychological matrix and religious symbolism of mystical experience.

3 credits. Schedule to be announced.

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

Staff

RLS 299 Readings in Religious Studies

Intensive study of a special topic in religious studies undertaken under close faculty supervision.
Prerequisite: Permission of program chairman.

1 to 6 credits

Staff

RESIDENTIAL STUDY PROGRAM (Experimental College)

Co-Directors (1972-73): SCHROER, WILLIAMS

The Residential Study Program, commonly called the Experimental College, attempts to integrate living and learning into a single experience which contributes to personal and emotional growth as well as to intellectual development. At present the program occupies the entire top floor of Kelly D, a university dormitory, in which student rooms, academic areas, and faculty offices form an educational community. Responsibility for administrative decisions, initiation and continuance of seminars and study groups and other academic and non-academic activities, is primarily borne by the students, individually and in groups; faculty are regarded as resource persons and as facilitators. Emphasis is placed on the development of a strong sense of community.

The program is regarded as a one year program and students entering are asked to make a year commitment to the RSP. This does not preclude one semester's involvement. Students participating in the RSP for two semesters will receive 30 upper division credits on a Pass/No Credit basis. (Students who are Liberal Arts Majors are allowed 30P/NC credits toward that major.)

The exact nature of the program varies from year to year, as guided by a charter written by members of the RSP in the previous year. Interested students should consult the Charter as well as visit the RSP in Kelly D before applying for membership.

INTERDISCIPLINARY PROGRAM IN SOCIAL SCIENCES

Chairman: ROSENTHAL *(Department of History)*

This recently established 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, 301, etc.) may be used to satisfy *one* of the requirements for a departmental concentration (as in A or 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 sciences departments distributed as folllows:

	Credits
A. Two courses in *each* of any two departments	12
B. Four courses in *each* 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 sciences department or departments	12

(With permission of the adviser, two of these courses may be chosen from appropriate offerings in black studies, environmental studies, social welfare and several other departmental or interdisciplinary programs.)

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Further information about the SSC major may be obtained in the Undergraduate Studies Office.

INTERDISCIPLINARY COURSES IN THE SOCIAL SCIENCES

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 or permission of instructor.

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 or permission of instructor.

Spring, 3 credits

SSC 301 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.
Prerequisites: Junior or senior standing and 18 hours of social sciences credit.

Spring, 3 credits

SSC 302 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.
Prerequisites: Junior or senior standing and 18 hours of social sciences credit.

Fall, 3 credits

SSC 330 Topics in Modern Latin America

A topical examination of 19th and 20th century Latin America emphasizing social and political institutions and their receptivity or resistance to change. Two or three topics will be chosen from among the following: land tenure, the Church, education, population growth, the role of the middle sectors, race, immigration, industrialization, urbanization, nationalism, the military, guerilla warfare and counter-insurgency.
Prerequisite: Nine hours of Latin American history or the equivalent.

Spring, 3 credits
Staff

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.
Prerequisites: Upper level standing, 18 hours in the social sciences and permission of program chairman.

Fall and Spring, 1 to 6 credits
Staff

SOCIAL STUDIES SECONDARY TEACHER PROVISIONAL NEW YORK STATE CERTIFICATION PROGRAM

In the selection of courses to satisfy the requirements listed below, a student and his or her adviser 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 Stony Brook General University Requirements

Credits

C. Preparation in Social Science 45
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 American history; six credits in European history; and three credts in non-Western history (Latin American, African, Asian).

2. The major requirements of one of the following departments or interdisciplinary programs: Anthropology, Asian Studies, Black Studies, Economics, History, Ibero-American Studies, Political Science, Social Sciences Interdisciplinary Program, Sociology. Only the majors specified here are acceptable for the Social Science 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.

D. Preparation in Related Fields (not Social Science) 9
Nine credits to be selected in other appropriate related fields with permission of the Social Studies Teacher Certi-

fication Program adviser. At least three credits of the total must be chosen from courses beyond the introductory level.

E. Preparation in Education 24

1. EDU 204 Adolescent Growth and Development (three credits)
2. Six credits in methods of teaching social studies in secondary schools: EDU 397 or HIS 397 *and* EDU 375 or EDU 398 or HIS 398
3. EDU 350 Supervised Secondary School Teaching (12 credits) *and* EDU 354 Student Teaching Seminar (three credits)

DEPARTMENT OF SOCIOLOGY

Distinguished Professor: L. COSER

Professors: R. COSER, DOGAN *(Adjunct)*, GAGNON, KELMAN *(Adjunct)*, K. LANG, PERROW *(Director of Graduate Studies)*, SCHILD *(Adjunct)*, SELVIN, SINGER, WEINSTEIN

Associate Professors: COLE, [a]COLLVER, FELDMAN, [a]GOODE, GOODMAN *(Chairman)*, POLSKY, SUTTLES, WEITMAN

Assistant Professors: BRYSON, DILL, HARRISON, PHILLIPS, SCHWARTZ, TANUR

Lecturers: LOGAN, WEDOW

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

A. SOC 103 Introduction to Sociology

B. SOC 201 Research Methods in Sociology (to be taken in sophomore year)

[a] On leave academic year 1973-74.

C. *Either* of the following sequences:

1. SOC 361 Historical Development of Contemporary Sociology and SOC 362 Introduction to Sociological Theory, *or*

2. SOC 396, 397 Sociological Theory and Research I, II

Note: The sequence chosen should be taken in the junior or senior year. The SOC 396, 397 sequence is intended for majors who wish to participate in the departmental honors program, which is described below.

D. Additional credits in sociology courses.

SOC 202 is strongly recommended but is not required. Qualified seniors may register for graduate courses with the approval of the departmental adviser.

Note: Six of these additional credits required for the major may be taken for a Pass/No Credit grade.

II. Study in related areas

A. MSM 121 Calculus I or MSA 101 Introduction to Finite Mathematical Structures I or *two* other courses in mathematics chosen in consultation with the departmental adviser.

B. At least three appropriate courses chosen from a single social science in consultation with the adviser.

Note: Any of these courses may be taken for a Pass/No Credit grade.

Honors Program

Students interested in graduating with honors in sociology should discuss the honors program with a departmental adviser. The following requirements must be met:

1. A 3.3 cumulative grade point average in all sociology courses through the junior year.

2. Enrollment in SOC 396, 397 rather than the sequence SOC 361, 362.

3. Completion of a senior honors essay under the direction of one or more faculty members. The subject and scope of the essay will be jointly determined by the student and faculty sponsor(s), who will judge the quality of the completed essay.

COURSES IN SOCIOLOGY

SOC 103 Introduction to Sociology

A survey of the main concepts in sociological analysis. This course is the prerequisite for all further sources in sociology.

3 credits

L. Coser and Staff

SOC 121 American Society

Important characteristics of American social structure; power and patterns of inequality; emphasis on economic and political institutions.
Prerequisite: SOC 103 or permission of instructor.

3 credits

Staff

SOC 161 Ethnic Relations

The formation, migrations and conflicts of ethnic and other minority groups; prejudice, discrimination and minority self-hatred.
Prerequisite: SOC 103 or permission of instructor.

3 credits

Staff

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.
Prerequisite: SOC 103 or permission of instructor.

3 credits

J. Logan, T. Rosenberg, H. Selvin

SOC 202 Statistical Methods in Sociology

An introduction to the use and interpretation of statistical methods in social research; descriptive and inferential statistics.
Prerequisite: SOC 103 or permission of instructor.

3 credits

J. Tanur

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 or permission of instructor.

3 credits

Staff

SOC 204 Courtship and Marriage

Social factors affecting courtship, mate-selection and engagement; dynamics of marital adjustment and parenthood.
Prerequisite: SOC 103 or permission of instructor.

3 credits

J. Gagnon, N. Goodman

SOC 205 Principles of Sociology

An introduction for non-sociology majors emphasizing major sociological works and ideas.
Prerequisite: Junior or senior standing or permission of instructor.

3 credits

Staff

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 or permission of instructor.

3 credits

Staff

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 explanations for their situation; and study of the effects of social welfare institutions upon the poor.

Prerequisite: SOC 103 or permission of instructor.

3 credits

J. 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 or permission of instructor.

3 credits

D. Phillips

SOC 220 Population Problems

Sources and consequences of changes in population size and composition; the "demographic explosion."
Prerequisite: SOC 103 or permission of instructor.

3 credits

T. Rosenberg

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 or permission of instructor.

3 credits

Staff

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 or permission of instructor.

3 credits

M. Harrison

SOC 236 Social Change

The impact of technological, generational and cultural forces on social organization from a historical and comparative perspective.
Prerequisite: SOC 103 or permission of instructor.

3 credits

K. Bryson

SOC 237 Deviance and Delinquency

Social factors related to juvenile crime, non-victim crime and legal but stigmatized behavior; competing theories and research methods.
Prerequisite: SOC 103 or permission of instructor.

3 credits

N. Polsky

SOC 239 Sociology of Crime

Crime as a social institution; problems of research method; types of criminal behavior systems and subcultures; sociology of law enforcement; theories of crime causation and control.
Prerequisite: SOC 103 or permission of instructor.

3 credits

N. Polsky

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 or permission of instructor.

3 credits

J. Tanur, E. Weinstein

SOC 243 Sociology of Youth

Adolescent socialization; age structures and intergenerational conflict; peer groups and youth subcultures.
Prerequisite: SOC 103 or permission of instructor.

3 credits

S. Wedow

SOC 247 Women and Men

The roles of women and men in different societies. Changing relations between the

sexes. Women's liberation and related movements.
Prerequisite: SOC 103 or permission of instructor.

3 credits

Staff

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 or permission of instructor.

3 credits

K. Bryson

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 or permission of instructor.

3 credits

Staff

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 or permission of instructor.

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 or permission of instructor.

3 credits

J. Logan

SOC 260 Comparative Social Structures

The principal complex societies and their central institutions, with emphasis on industrialization and economic development.
Prerequisite: SOC 103 or permission of instructor.

3 credits

Staff

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 or permission of instructor.

3 credits

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 or permission of instructor.

3 credits

K. Lang

SOC 281 Sociology of Organizations

Bureaucracy as a form of organization; the structure of relations between and within organizations.
Prerequisite: SOC 103 or permission of instructor.

3 credits

Staff

SOC 282 Small Groups

The structure and functioning of face-to-face groups in field and laboratory settings.
Prerequisite: SOC 103 or permission of instructor.

3 credits

Staff

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 or permission of instructor.

3 credits

Staff

SOC 291 Special Topics

Lectures on topics of current sociological interest which will be announced before the start of the term.
Prerequisite: SOC 103 or permission of instructor.

Fall and Spring, 3 credits

Staff

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 for a total of nine credits.
Prerequisite: Permission of instructor and, if for 4-6 credits, written permission of department.

Fall and Spring, credit variable

Staff

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 or permission of instructor.

3 credits

R. Coser

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.

3 credits

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.

3 credits

S. Weitman

SOC 358 War and Military Institutions

The role of violence in social affairs; military organizations; civil-military relations.
Prerequisite: SOC 103 or permission of instructor.

3 credits

K. Lang

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 or permission of instructor.

3 credits

D. Phillips

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 or permission of instructor.

3 credits

S. Weitman

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.
Prerequisite: Permission of department.

3 credits each semester

Staff

SOC 396, 397 Sociological Theory and Research I, II

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: SOC 103 and SOC 201, junior or senior standing and permission of department.

6 credits each semester

K. Lang

SOC 398 Honors Thesis

Weekly seminar, conferences with advisers, research and writing of report on a topic chosen in consultation with a faculty adviser and the director of the honors program. May be repeated up to a total of nine credits.

Prerequisite or corequisite: SOC 396, 397.

Staff

Fall and Spring, 1 to 6 credits

DEPARTMENT OF THEATRE ARTS

Professor: NEWFIELD

Associate Professors: AUERBACH *(Chairman)*, BRUEHL, DYER-BENNET, R. HARTZELL, NEUMILLER, PETERSON

Assistant Professors: DELL, FINLAYSON, OLF

Instructors: BOND, D. BROWN

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:

	Credits
A. 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
B. Either THR 114 Rehearsal and Performance or THR 116 Technical Production	1
C. THR 201, 202 The Pro-Seminar	6
D. *A Minimum of Nine Credits from Courses on the 300 level	9
E. *Courses from the remaining departmental offerings to total 12 credits	12
	41

* Some theatre-related courses outside the departmental offerings may be substituted, with the approval of the departmental adviser.

COURSES IN THEATRE ARTS

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 presentations of films, lectures by specialists and live and electronic theatre events. All such presentations will be followed by discussion.

Fall and Spring, 3 credits

J. Olf

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

Staff

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 or permission of instructor.

Fall and Spring, 1 credit

Staff

THR 130 Voice Training for Actors

Individualized training designed to strengthen and clarify the speaking voice. Students arrange weekly tutorials with instructor. Open only to students with a professional commitment to acting or other professional users of the speaking voice. 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

R. Bond

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

Staff

THR 137 Film Expression

An introduction to those formative means unique to film by which the director-author expresses 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 filmmakers. 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

C. Dell

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

D. Brown

THR 150 Stage Costume

(Formerly THR 236)

An introduction to the history of costume, with emphasis on the esthetics of costume design and costume rendering techniques.
Prerequisite: Permission of instructor.

Fall and Spring, 3 credits

D. Brown

THR 201, 202 Pro-Seminar I, II

A reading list from the world dramatic repertoire will be distributed at the outset of each semester. Students will meet periodically with members of the theatre faculty to discuss specific plays from the viewpoints of performance and production. Additional meetings by appointment with advisory staff required prior to seminar presentations.
Prerequisite: THR 101.

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

Staff

THR 221, 222 History of Theatre I, II

A survey of the history of theatre from early ritual to 1900. Evolving architectural concepts, scenic conventions, technology and production techniques will be studied with references to corresponding literary, social and cultural trends. History of Theatre I: Ritual to 1660. History of Theatre II: 1660 to 1900.
Prerequisite: THR 101.

Fall (221) *and Spring* (222), *3 credits each semester*

J. Olf

THR 230 Voice and Diction

(Formerly THR 133)

Students who have made sufficient progress in THR 130 now proceed to combine those advances with methodical reconstruction of habits of articulation and idiomatic usage toward the goal of a cleanly articulated, standard American usage.
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

R. Bond

THR 234 The Moving Image

This first course in film-making technique requires students to explore the esthetics 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 or permission of instructor.

Fall and Spring, 3 credits

Staff

THR 238 Stage Lighting

Basic theories of stage lighting approached from a technical and an esthetic viewpoint, leading to the practical planning of light plots for individual plays.
Prerequisite: THR 132 or permission of instructor.

Spring, 3 credits

R. Bond

THR 239 Directing I

An introduction to the work of the director in selecting and preparing the play for production. Problems of style, interpretation and execution. The director's

approach to the actor.
Prerequisites: THR 132 and 136.

Fall, 3 credits

M. Finlayson

THR 243 Stage Design II

Principles of design for the theatre including color composition and rendering techniques. These techniques are related to the esthetics both of dramatic composition and the flexibility of modern staging.
Prerequisites: THR 132 and 143.

Spring, 3 credits

D. Brown

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.
Prequisites: 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.
Prerequisite: Permission of instructor.

Spring, 3 credits

W. Bruehl

THR 257 Evolution of Modern Theatre and Drama

An examination of the evolving forms in the modern western theatre from 1900 to the present and how these evolutionary trends are embodied in dramatic literature.
Prerequisite: THR 101 or EGL 193 or equivalent.

Fall, 3 credits

W. Bruehl

THR 261 Movement for Actors

(Formerly THR 139)

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

C. Dell

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 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

M. Finlayson

THR 350 The Art of Minstrelsy

An exploration of the art of performing narrative poetry to music, together with a close look at the traditions of minstrelsy, its place in the social context and in the history of the performing arts generally. Sessions will include lecture, musical illustration and discussion.
Prerequisite: Permission of instructor.

Spring, 3 credits

R. Dyer-Bennet

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.
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 playscript for stage production: includes intensive literary and historical studies of the script, its adaptations, translations and previous productions.
Prerequisite: Permission of instructor.

Spring, 3 credits

J. Newfield

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.
Prerequisite: Permission of instructor.

Spring, 3 credits

W. Bruehl

THR 358 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.
Prerequisite: Permission of instructor.

Fall, 3 credits

J. Newfield

THR 359 Topics in the History of the Theatre

Each semester will treat in depth a special topic to be announced. For example, spe-

cial topics might be The 19th Century British Theatre, The Theatre of Naturalism, Restoration Theatre.
Prerequisites: THR 221, 222 or permission of instructor.

Fall and Spring, 3 credits
J. Newfield

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 221, 222 and permission of instructor.

Spring, 3 credits
J. Olf

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 or permission of instructor.

Spring, 3 credits
C. Dell

THR 362 Topics in Theory and Aesthetics of the Theatre

A detailed study of a specific theoretical and/or aesthetic problem. A topic might include the parallel study of the theories of Artaud and the theory and practice of such men as Beck, Brook and Grotowski.
Prerequisite: Permission of instructor.

Fall, 3 credits
J. Olf

PROJECTS COURSES

(Admission to these courses is by permission of departmental projects committee only.)

THR 390 Projects in Theatre Production

(Formerly THR 336, 341 and 344)

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
Staff

THR 391 Projects in History, Dramatic Literature and Theory

(Formerly THR 347)

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
Staff

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.
Prerequisite: Permission of projects committee.

Fall and Spring, 1 to 6 credits
L. Peterson

PROGRAM IN YOUTH AND COMMUNITY STUDIES

Director: MARTIN TIMIN

Faculty Advisory Committee:

Social Work (Community Representative)—ANDREW CASAZZA
English, Continuing Education—DAVID DICKSON
Sociology—NORMAN GOODMAN
Philosophy—PATRICK HEELAN
Human Development and Psychiatry—JOSEPH KATZ
Cooperative College Centers—RICHARD ROBINSON
Education—INGRID TIEGEL
Psychiatry—STANLEY YOLLES

The core program courses listed below aim 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. The program is not offered as a major, but rather as an academic concentration. It is expected that the program courses will help prepare students for a variety of human service occupation choices at the B.A. level (e.g., youth services, 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 program courses and other University courses and to explore occupational and professional choices. In both University and community settings, the courses will draw on the resources of graduate students in the social sciences, humanities and health sciences; community-based human services professionals; community residents from a range of racial, ethnic and social class backgrounds.

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 selected 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 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.
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.
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.
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.
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 reflections and in encouraging ongoing communication among students and faculty around ideas and experiences generated in the program. Three hours per week.
Prerequisites: Sophomore standing and permission of instructor.

Fall and Spring, 2 credits

COLLEGE OF ENGINEERING

Program in 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 science, mechanics or materials science.
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.

Programs of graduate work in the various engineering disciplines are offered within the College and also in cooperation with other parts of the University.

The College of Engineering with five departments—applied mathematics and statistics, computer science, electrical sciences, materials science and mechanics—grants the Bachelor of Engineering degree.

Degree Requirements

All candidates for the Bachelor of Engineering 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.*

I. General University Requirements

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 credits

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: anthropology, Asian studies, black studies,** economics, education, history, Ibero-American studies, 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 credits

D. Arts and Humanities

Two semester courses, to be chosen from among the offerings of the following departments or interdisciplinary programs: art, black studies,** Chinese, classics and classical languages, comparative literature, English, French, Germanic and Slavic languages, Hebrew, Hispanic languages, Italian, linguistics, music, philosophy and theatre arts ..... 6-8 credits

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* See information on advanced placement and the Challenge Program examinations as a means of earning semester hour credit toward graduation, page 32 this *Bulletin*.

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

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

1. Art: the first two semesters of the studio courses ART 120, 121, 122, 123, 124, 126.
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. Physical Education
Two semester courses, which may be taken at any time prior to graduation, or participation in intercollegiate athletics. No academic credit is given.

The physical education requirement may be waived for students presenting appropriate documentation to the Office of Records confirming their having met one of the following conditions: (1) previous active military, Peace Corps, or VISTA service, (2) 27 years of age or older at the time of matriculation, (3) motherhood. Students may petition the Department of Physical Education for a waiver of the physical education requirement for medical reasons.

F. Academic Standing
For graduation at least 120 credit hours of passing work must have been completed, with a cumulative grade point average during the last four semesters of at least 2.00, i.e., C-level.

G. Residence Requirements
To be certified for a degree, candidates must be registered as full-time students at the University for the two semesters immediately preceding graduation.

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 E may be granted upon recommendation of the department or other agency supervising the course.

II. Required Preparatory Courses in the Natural Sciences (32 credits)

The following courses provide the necessary preparation for the engineering concentration requirements:

A. Chemistry: CHE 101, 105, 102, or CHE 103, 109, 104 . 9 credits

B. Mathematics: MSM 121, 122, 153 ..... 11 credits

C. Physics: PHY 101, 102, 151 ..... 12 credits

(Note that any two of the above courses may be used to meet the general university requirement in natural sciences.)

III. Engineering Concentration Requirements

Every student must meet the requirements of a program of concentration in engineering approved by the faculty of the College of Engineering.

A. Required courses (51 credits)

Credit for, or exemption from, each of the following is required of all candidates:

	Credits
MSC 101 Introduction to Computer Science	3
MSM 154 Mathematics for Engineers I	4
MSI 155 Mathematics for Engineers II (or approved upper divisional course in mathematics)	3-4
ESG 111, 212 Engineering Laboratory I, II	4
ESG 213, 214, 215, 216 or 217 Engineering Experimentation	2
ESG 201 Thermodynamics	4
ESG 232, 233 Materials Science I, II	8
ESG 161, 263, 264 Mechanics	8
ESG 171, 272 Electrical Sciences I, II	8
ESG 340, 341 Engineering Design I, II	6

B. Required distribution of elective courses (33 credits)

The distribution of the 33 credits in elective courses required of all candidates is given below:

1. Technical electives (21 credits)

   Any engineering departmental or interdepartmental courses listed as technical electives or recommended by a student's adviser as appropriate to his or her academic program and approved by the College of Engineering curriculum committee.

2. Non-technical electives (6 credits)

   Any courses in the areas of the arts and humanities or the social and behavioral sciences except those listed as not acceptable in section I.C. and I.D. above. Three credits must be at a level beyond the introductory sequence in a given area.

3. Open electives (6 credits)

   Any courses offered by the University for credit at any level.

Exemptions

A student can gain an exemption from any of the course requirements specified in section III above by submitting a petition together with supporting material to the College of Engineering curriculum committee and getting committee approval.

A student can gain an exemption from a required engineering course by petitioning the College of Engineering curriculum 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 curriculum committee's decision.

Typical Undergraduate Sequence of Required Courses

Freshman Year

EGL 101
MSM 121, 122
PHY 101, 102
†CHE 101, 105, 102 or CHE 103, 109, 104
*MSC 101

Sophomore Year

ESG 111
ESG 161
ESG 171
MSM 153, 154
PHY 151

Junior Year

ESG 212 and one of ESG 213-217
MSI 155 or approved upper-divisional course in mathematics
ESG 233
Any two of these core courses: ESG 201; ESG 232; ESG 263, 264; ESG 272

Senior Year

ESG 340, 341
Remaining two core courses not taken in junior year

It is recommended that a student consult with an academic adviser when preparing a program for his or her junior and senior years. This program must include seven technical electives.

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* May be taken anytime before the fourth semester.
† May be taken in the sophomore year.

The following courses may be taken in any semester:

Two arts and humanities courses
Two social and behavioral sciences courses
Two non-technical elective courses (one must be beyond introductory sequence)
Two open electives

Programs of Specialization

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 science, mechanics and materials engineering, as well as in interdisciplinary fields of ocean, urban, computer or biomedical engineering or preparation for graduate studies in business, law and medicine. Recommended sequences of courses in these fields are listed below. Although variations in sequence can readily be accommodated through the elective program, students who plan a career in industry are advised to consult departmental advisers before choosing their own programs.

Electrical Sciences

Students interested in specializing in the area of electrical sciences should include in their elective sequence four of the six basic courses listed below. These basic courses along with the required engineering core sequences are designed to provide students with a thorough background in those areas of knowledge fundamental to the field of modern electrical engineering.

ESE 311 Electronic Circuits Design
ESE 315 Introduction to Feedback Control Theory
ESE 318 Digital Systems Design
ESE 319 Introduction to Electromagnetic Fields and Waves
ESE 340 Basic Communication Theory
ESE 350 Electrical Power Systems

Additional electives may be chosen to provide specialization in fields such as communications and control systems, digital electronics and systems, computer systems engineering, electronic circuits, lasers and optical electronics, and semiconductor devices. Detailed information concerning specific elective sequences may be obtained by consulting the "Undergraduate Guide to Electives in Electrical Sciences" which is available from the office of the Department of Electrical Sciences.

Materials Science

A student may acquire professional preparation in the field of materials science by taking a four course elective sequence consisting of ESM 302, 336 and any *two* of ESM 306, 309, 325 listed below:

ESM 302 Materials Design and Techniques
ESM 306 Mechanical Properties of Engineering Materials
ESM 309 Thermodynamics of Solids
ESM 325 Diffraction Techniques and the Structure of Solids
ESM 336 Modern Theory of Solids

Further specialization in the fields of electronic materials, strength of materials, environmental effects on materials, nuclear materials and biomedical materials may be obtained by taking two additional elective courses. Students are advised to obtain a list of recommended course sequences from the departmental office.

Mechanics

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 adviser 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, ESC 392, ESS 347

Structural Engineering
ESC 330, ESC 332, ESC 334, ESC 342, ESC 381, ESM 306

Interdisciplinary Programs

The flexibility of the elective system in the engineering curriculum allows students to plan a program adapted to their particular career goals. Hence, it is possible to plan an emphasis in an interdisciplinary field involving other departments or divisions of the University. Students may wish to plan programs in order to take advantage of developing areas of engineering. Current programs of interest to students are those of ocean engineering and urban and policy science as illustrated below. Other programs in computer science, applied mathematics and statistics, and biomedical engineering may be developed in consultation with faculty advisers. Students should insure that electives taken outside of the College of Engineering have been approved as technical electives.

Ocean Engineering

Students interested in professional careers in ocean engineering or graduate studies in oceanography may specialize in an interdepartmental major in ocean engineering. The student is advised to take the following core sequence as electives:

ESI 280 Introduction to Ocean Engineering
ESC 330 Structural Analysis
ESC 372 Experimental Fluid Mechanics
ESC 392 Dynamical Oceanography

Students may further specialize in this field by selecting from the following courses. Complementary courses in other departments are suggested and should be chosen in consultation with a faculty adviser in the field.

ESC 361 Vehicular Dynamics
ESC 305 Materials for Ocean Engineering

Urban and Policy Sciences

The Program for Urban and Policy Sciences was originally established as a graduate program for urban science and engineering in the College of Engineering. It has recently been enlarged to include a number of social scientists with allied interests and now functions as an all-campus unit.

The program is designed to provide quantitative training, through course work and practical experience for students interested in professional careers associated with problems in the public sector. The program is characterized by its emphasis on the need for combining skills and techniques of technical and mathematical disciplines with an understanding of the economic, political and social driving forces that pervade all public problem analysis. Students planning an emphasis in this field may take UPS 320, 321 as technical electives and UPS 351 and PHY 303 as open or non-technical electives.

Preparation for Graduate Studies in Law, Medicine, Business

With the increasing technical basis of society, engineering can be valuable preparation for a career in other professions, notably those of business administration, law and medicine. A student may obtain a degree in engineering while preparing for continuation in these professions through the use of open electives. Additional preparation in these fields may be obtained by taking up to two technical electives from the courses listed below. Special adivsers are available for the following three programs. It is emphasized that these programs are intended as a guide and that alternatives may be arranged through the advisers. Use of technical electives may be granted by the curriculum committee to any sequence which constitutes a cohesive program.

ACADEMIC PROGRAM

Major: Engineering

Minor: Pre-medicine—Adviser V. A. Marsocci; Pre-law—Adviser S. S. L. Chang; Pre-business administration—Adviser S. N. Levine

CURRICULUM

Same as engineering with the following additional courses:

Pre-law POL 140, 224, 230, 232
Pre-medicine: BIO 101, 102; CHE 201, 202
Pre-business administration: ESI 290, 291; ECO 100, 114

Computer Science

The Department of Computer Science is associated with the College of Engineering and maintains its research facilities within the graduate engineering building. It is possible for engineering students to achieve two baccalaureate degrees, one in engineering and one in computer science, by selecting electives as suggested below. The requirments for the Bachelor of Science degree with the major in computer science can be found on page 192. The electives required for an engineering student to satisfy requirements for a B.S. in computer science are:

ESI 202, MSM 211, MSA 201, MSA 226, ESE 318 and *three* courses chosen from among:

MSC 201, MSC 302, MSC 303, MSC 304. In addition 30 credits must be taken in humanities or social sciences.

Applied Mathematics and Statistics

The Department of Applied Mathematics and Statistics is associated with the College of Engineering. It is possible for engineering students to achieve two baccalaureate degrees, one in engineering and one in applied mathematics and statistics, by selecting electives as follows:

Seven MSA technical electives and one additional math course above the 200 level. MSI 200 and 202 are recommended and may be taken as open electives.

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 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 degreees must fulfill the requirements of the undergraduate program in engineering in the College of Engineering and the requirements of an established degree program in the College of Arts and Sciences.

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 curriculum committee of the College of Engineering.

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 by engineering majors are those fulfilling the arts and humanities, social and behavioral sciences, technical elective, non-technical elective and open elective requirements.

Courses of Instruction

Course designations are abbreviated according to the following scheme:

ESG: Required engineering courses for program of concentration

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 Mechanics

ESI: Interdepartmental courses offered by the College of Engineering

MSA: Courses offered by the Departmest 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

UPS: Courses offered by the Program in Urban and Policy Sciences

Courses are numbered in accordance with the following general pattern:

101-199 freshman-sophomore courses
200-399 junior-senior courses
500-699 graduate courses

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 cricuits.
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 kinematics 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 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. Herley

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 adviser'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 of are applied to the control of the properties of semiconductors, commercial plastics and engineering alloys by thermomechanical 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 description of the fundamental types of lattices and simple crystal structures the problem of crystal diffraction is discussed and the concept of reciprocal lattice introduced. Emphasis is placed on the quantum nature of matter and the resulting properties of molecular and crystalline systems. Properties of perfect crystals such as band formation are developed and the electronic structure is discussed. The related properties of metals, semiconductors, superconductors and insulators are derived, attention being also devoted to the problem of lattice vibrations, thermal and elastic characteristics, magnetic and optical properties of materials.
Prerequisites: CHE 102, PHY 151. (Materials Science I is not a prerequisite.)

Spring, 4 credits

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. Cess

ESG 264 Introduction to Fluid Mechanics

Concepts and applications of fluid mechanics leading to areas of special current interest. Planetary atmospheres; oceanography; high speed transportation. The potential flow and the boundary layer. Environmental sciences and structural loads. Subsonic versus supersonic flows. Magnetic fluids, non-Newtonian fluids and super fluids.
Corequisite: ESG 263 for ESG majors.

Fall, 2 credits
Mr. Lee

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 ENGINEERING 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

ESI 100 Engineering Orientation Seminar

One-hour lecture each week by a speaker from outside or from the College of Engineering faculty, which may be followed by an informal discussion hour with the speaker. All students enrolled are expected to attend the lectures, but only those students sufficiently interested to learn more from the speaker should attend the discussion. 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.

Spring, 1 credit repetitive

ESI 190, 191 Man, Technology, and Society I, II

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, transporation, health delivery 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. Technology assessment and futurology are considered in relation to the social control of technology development. Three hours of lecture each week. Primarily intended for non-engineering majors.

Fall and Spring, 3 credits

Messrs. Liao and Truxal

ESI 200 Independent Study Project

See page 281.

Fall and Spring, variable up to 18 credits each semester, repetitive

Staff

INTERDEPARTMENTAL TECHNICAL ELECTIVES

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, in-

ventory 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, production standards, forecasting and inventories, quality control, automation techniques in production.

Spring, 3 credits

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: BELTRAMI, DICKER, DOLEZAL, GERST, TEWARSON, ZEMANIAN *(Acting Chairman)*

Associate Professors: CHEN, DUNCAN, KIM, LEIBOWITZ, SRIVASTAV

Assistant Professors: GRAN, TUCKER *(Director of Undergraduate Studies)*

The Department of Applied Mathematics and Statistics offers an undergraduate program leading to the B.S. degree. The program is intended to prepare the student for graduate study in applied mathematics or for certain positions in industry and government. It also provides a relevant and meaningful background for those planning to specialize professionally in the mathematical aspects of medicine, economics, urban science and engineering.

The course offerings in applied mathematics are designed with a view towards their utilization in the physical, social, biological and behavioral sciences. The last several decades have been witness to the increasing use of mathematical methods in nearly all fields of endeavor and the consequent need for trained applied mathematicians who can play an important role in the development of quantitative models and solution techniques for a broad array of challenging problems. To cite just a few examples of diverse areas where applied mathematics is now playing a crucial role, one can mention: space flights and ecology, where nonlinear differential equations are important tools; computer design and the allocation of urban resources, where use is made of linear program-

ming optimization techniques and combinatorial methods; genetics and communications systems, where probabilistic and algebraic methods are employed; economic theory which employs systems analysis and operations research.

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; PSY 381, 382; PHY 343, 344.)

Recommendations for Students Majoring in Applied Mathematics and Statistics

Most courses offered by the Department of Applied Mathematics and Statistics fall into one of two general areas: Area I—natural science (physics, chemistry, engineering) related mathematics—MSA 217, 226, 227, 301, 302, 321, 324, 351, 352, 371 and MSI 201, 202; and Area II—operations research and social science related mathematics—MSA 201, 202, 251, 252, 316, 325, 331, 333, 334. However, some courses (especially MSA 217 and MSA 251) have substantial application in both areas. Normally a student majoring in applied mathematics and statistics tends to concentrate in one of these two areas. Double majors are encouraged.

The department encourages students interested in Area I to take:

1. Basic courses in the natural sciences (especially PHY 101, 102 and 151);
2. The following courses from Area I: MSA 226, 227 and 217 (plus other courses in Area I);
3. The following courses from Area II: MSA 251 and either MSA 201 or MSA 252.

The department encourages students interested in Area II to take:

1. Basic courses in the social and behavior sciences (ECO 100, PSY 101, SOC 103);
2. The following courses from Area I: MSA 217, MSA 226;
3. The following courses from Area II: MSA 201, MSA 251, 252 (plus other courses in Area II).

COURSES IN APPLIED MATHEMATICS AND STATISTICS

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 life 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

J. Alessi

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

A. Friedman

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

A. Tucker and Staff

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 student: the biological and social science student, who views mathematical modeling as a necessary tool for analysing 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 or permission of instructor.

Spring, 3 credits

A. Tucker

[MSI 155 Mathematics for Engineers II]

(See description on page 201.)

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

I. Gerst, A. Tucker

[MSI 201, 202 Advanced Calculus for Scientists I, II]

(See description under Interdepartmental Courses in Mathematical Sciences.)

MSA 217 Ordinary Differential Equations

This course deals with the theory and properties of ordinary differential equations which are of importance in the application of this subject. Among the topics covered are solutions of singular equations; boundary value problems; the Green's function method; eigenvalue problems; oscillation and non-oscillation theorems, asymptotic behavior of linear systems; non-linear autonomous systems; focal, nodal and saddle points; cycles; stability; Lyapunov functions; the van der Pol, Liénard and Duffing equations; approximate solutions.
Prerequisite: MSM 151.

Fall and Spring, 3 credits

W. J. Kim

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

R. Tewarson

MSA 227 Approximation Theory

Smoothing of data, least squares methods, interpolation, polynomial approximation and quadrature formulas.
Prerequisite: MSM 152.

Spring, 3 credits

I. Gerst

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 251, 252 except by petition to department curriculum committee.)
Prerequisite: MSM 121 or 191.

Fall and Spring, 3 credits

Staff

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.
Prerequisite: MSM 122 or MSM 191.

Fall and Spring, 3 credits each semester

Staff

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 1973-74.

MSA 316 Mathematical Programming

Formulation of linear programming models. The simplex method and its variations. The duality theorem. Sensitivity analysis. Solution of practical problems in blending, transportation, etc., with the help of computers.
Prerequisite: MSM 151.

Spring, 3 credits

Staff

MSA 321 Mathematics of Networks

Review of complex variables and Laplace transforms. Properties of positive real functions and Hurwitz polynomials. Matrix analysis of networks. Derivation of positive real character of RLC driving-point impedances. Synthesis of two-element kind networks. Use of Bott-Duffin and Darlington techniques for synthesis of RLC networks. Synthesis of transfer

functions using RC and RLC networks. Design of lossless filters with loading. Use of negative impedance converter and isolation amplifier in design of driving-point and transfer functions. Introduction to approximation techniques in the frequency and time domains. Amplitude and frequency scaling. Design of specific filters, delay lines, phase shifters and oscillators.
Prerequisite: MSM 152.

Spring, 3 credits. Not offered 1973-74.

MSA 324 Special Functions of Applied Mathematics

A study of the more common higher mathematical functions which are required for the analytical solution of engineering and scientific problems. The Bessel, Legendre, hypergeometric and Mathieu functions are among those to be considered. Topics include: orthogonal sets of functions, recursion formulas, series solution of linear differential equations, Fourier-Bessel expansions, asymptotic expansions, functional equations, application to boundary value and initial value problems.
Prerequisite: MSM 152.

Fall, 3 credits. Not offered 1973-74.

MSA 325 Introduction to Operations Research

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

E. Beltrami

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 either MSA 250 or 251.

Spring, 3 credits

D. Dicker

MSA 333, 334 Mathematical Foundations of Economics I, II

An extensive survey of mathematical economics both from a contemporary axiomatic viewpoint (Debrew-type) and from a neo-classical viewpoint (Samuelson-type). Topics include utility theory, input-output models and general equilibrium theory.
Prerequisites: MSM 152 and MSM 201.

Fall, 3 credits

P. Kalman

MSA 351, 352 Mathematical Models in the Physical Sciences I, II

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 and Spring, 3 credits each semester

Staff

MSA 353 Design and Analysis of Experiments

Theory of least squares, the general linear hypothesis and analysis of variance, analysis of multiple classification, randomized blocks, Latin squares.
Prerequisite: MSA 250 or 252 or permission of instructor.

Fall, 3 credits

Staff

MSA 371 Optimization Theory

Multiplier rules and constrained minimization. An introduction to the calculus of variations and control theory.
Prerequisite: MSI 201.

Spring, 3 credits

Staff

MSA 390 Research in Applied Mathematics

A course which will give the student an opportunity to be involved in an independent research project with supervision

by the faculty. Permission to register will require that the students have average grades of B in their courses and that they obtain the agreement of faculty members to supervise their research.

Prerequisite: Permission of instructor and department.

Fall and Spring, 3 credits

Staff

TECHNICAL ELECTIVES IN APPLIED MATHEMATICS AND STATISTICS

MSA 390 Research in Applied Mathematics

MSA 201, 202 Finite Mathematical Structures I, II

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 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

DEPARTMENT OF COMPUTER SCIENCE

Professors: FINERMAN, GELERNTER, HELLER, KIEBURTZ *(Chairman)*, PAZ *(Visiting)*, D. R. SMITH, TYCKO

Associate Professor: BERNSTEIN *(Director of Undergraduate Studies)*

Assistant Professors: AKKOYUNLU, CHERNIAVSKY, FIDUCCIA, ZALCSTEIN

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 computing 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 flexibilty 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. MSC 101, 102 and three courses from among MSC 201, 302, 303 and 304
   B. MSM 121, 122, 151 (or MSM 191, 192, 193) and MSM 211
   C. MSA 201, 226 and 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.

   Note: To achieve the necessary depth in specific fields students are encouraged to elect their remaining credits from the course offerings in no more than two disciplines chosen according to their secondary interests.

Pass/No Credit Option

A student may, with permission of an adviser, register for a Pass/NC grade in any course not used to satisfy the requirements of I or II above.

Sample Program (required courses only)

Freshman	*Sophomore*	*Junior*	*Senior*
MSM 121	MSM 151	MSA 201	MSA 251
MSM 122	MSM 211	MSA 226	ESE 318
MSC 101	MSC 201*	MSC 303*	MSC 302*
MSC 102		MSC 304*	

* Three of these four courses are required.

COURSES IN COMPUTER SCIENCE

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

Mr. Kieburtz

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, 3 credits

Mr. P. Siegel

MSC 201 Advanced Programming

A comprehensive survey of several high-level programming languages and their applications, such as ALGOL for algebraically oriented problems; LISP for list processing; SNOBOL for processing textual information.
Prerequisite: MSC 101.

Fall and Spring, 3 credits

Mr. Akkoyunlu (Spring), Mr. Zalcstein (Fall)

MSC 301 Research in Computer 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, UPS 301) may be counted towards fulfillment of technical elective requirements.

Fall and Spring, 3 credits, repetitive

Staff

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.
Prerequisites: MSC 102, ESE 318.

Spring, 3 credits

Mr. D. Smith

MSC 303 Introduction to the Theory of Computation

Finite state machines and regular expressions, Turing machines, the halting problem, computable numbers, recursive functions, formal languages.
Prerequisite: MSC 102.

Fall, 3 credits

Mr. Fiduccia

MSC 304 Introduction to Systems Programming

Topics sutdies include elementary data structures, including arrays and linked lists, pushdown stacks, trees and transfer vectors. Basic computer programming systems such as loaders, assemblers, compilers and simple monitors will be investigated.
Prerequisite: MSC 102.

Spring, 3 credits

Mr. Tycko

TECHNICAL ELECTIVE IN COMPUTER SCIENCE

MSC 201 Advanced Programming
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

DEPARTMENT OF ELECTRICAL SCIENCES

Professors: BRAUN, CHANG, MARSOCCI *(Chairman)*, D. R. SMITH, STROKE, TRUXAL

Associate Professors: CARLETON, C. T. CHEN, DOLLARD, RAPPAPORT, THOMAS, TUAN

Assistant Professors: BARRY, HARRISON, SHORT, WAYNE

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, UPS 301) may be counted towards fulfillment of technical elective requirements.

Fall and Spring, 3 credits, repetitive

Staff

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. Prerequisite: Senior standing or permission of instructor.

Spring, 3 credits

ESE 304 Electronic Instrumentation Engineering

Elements of the design of electronic instrumentation. Structure of basic measurement systems; requirements for distortionless systems; transducers; instrumentation amplifiers; analog and digital signal conditioning; measurements in the presence of noise; sampling multiplexing; recorders and display devices; automated measurement systems. Applications of measurement system to pollution, biomedical and industrial monitoring will be considered. Prerequisite: ESG 252.

Fall, 3 credits

Mr. Short

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. Non-linear and time varying circuits. State variable representation.
Prerequisite: ESG 251 or 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 252.

Spring, 3 credits

ESE 315 Introduction to Feedback Control Theory

This course comprises an introduction to the concepts of system control through feedback and the mathematical techniques required in the modeling, analysis and design of feedback control systems. Using examples from such fields as electronics, aircraft guidance, economics, biology and machine control.
Prerequisite: ESG 171.

Spring, 3 credits

ESE 316 Digital Devices and Circuits

Survey of active switching devices, circuit models, large signal amplification, simple logic circuits, design of regenerative circuits, survey of storage devices, circuit systems of logic and design problems of circuit interconnection. Laboratory on construction and testing of simple circuits in latter half of semester.
Prerequisite: ESG 252.

Fall, 3 credits

ESE 317 Digital Logic and Systems

Switching algebra and its relation to digital circuits, logic and sets. Analysis and synthesis of combinational and sequential networks. Techniques for economical circuit implementation. Counting devices, arithmetic units and algorithms. Simple codes. Algebraic manipulation of simple logical statements with applications.

Spring, 3 credits

ESE 318 Digital Systems Design

A course intended to be of use to nonspecialists, and in addition, to be part of the digital-circuits and systems sequence. It starts from a description of digital circuits regarded as functional blocks and leads to a consideration of the more commonly-encountered systems. The material is presented from an applied point of view, utilizing demonstrations and laboratory experiments. Topics included are: basic Boolean algebra, gate types, counters, registers, arithmetic circuits, data communication.
Prerequisite: Senior standing or permission of instructor.

Fall, 3 credits
Mr. Short

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.

Spring, 3 credits
Mr. Tuan

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 252.

Fall, 3 credits

Mr. Wayne

ESE 331 Physical Electronics

A study of the physical principles involved in the operation of electronic devices such is bipolar transistors, field effect transistors, lasers, superconducting devices 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.

Prerequisites: ESG 251 and 252 or ESG 171 and 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.

Spring, 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 345 Computer Architecture

A study of computer elements and structure with emphasis on computer designs both for general purposes and special applications. Simulation of computer systems. Organization of multiprocessor systems and computer networks.

Corequisite: ESE 317 or ESE 318.

Fall, 3 credits

Mr. Smith

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.

Prequisite: Junior or senior engineering majors; senior standing (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 101.

Fall, 3 credits
Mr. Chang

ESE 360 Introduction to Coherent Optics and Holography I

A course introducing the field of modern optics and electro-optical science, together with all required mathematics. Particular emphasis is placed on generally applicable fundamentals, as well as on similarities with electrical sciences and radio-astronomy techniques. The theory is developed and illustrated with examples drawn from the most recent applications of holography (3-D laser imaging) including optical computing, image deblurring, optical correlators, holographic interferometry (vibration and stress analysis), microwave, radar and acoustical imaging. Prerequisite: Senior standing or permission of instructor.

Fall, 3 credits
Mr. Stroke

ESE 361 Coherent Optics and Holography II

The field of modern optics and electro-optical sciences together with all required mathematics, including additional fundamentals and ramifications based on the material presented in ESE 360.
Prerequisite: ESE 360.

Spring, 3 credits
Mr. Stroke

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, economic and urban systems.
Prerequisites: ESG 171 or equivalent.

Fall, 3 credits

DEPARTMENT OF MATERIALS SCIENCE

Professors: Jona, S. Levine, Nathans, [a]Seigle, F. Wang *(Chairman)*

Associate Professors: [a]Bilello, [a]Carleton, Herman, Jach, R. Siegel

Assistant Professors: Preece, Strozier

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, UPS 301) may be counted towards fulfillment of technical elective requirements.

Fall and Spring, 3 credits, repetitive
Staff

[a] On leave spring semester 1974

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 controling treatments.

Fall, 3 credits

Mr. Herley

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

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

ESM 309 Thermodynamics of Solids

The basic laws and thermodynamic relationships are briefly reviewed, with emphasis on the computation of standard free energy changes of reactions and application to equilibrium calculations. Current knowledge regarding the thermodynamic properties of condensed phases is discussed, including the thermodynamics of first and higher order phase transitions in solids. The thermodynamic treatment of ideal, regular and real solutions is reviewed. Use of the foregoing in the estimation of reaction free energies and equilibria in condensed phase reactions such as diffusion, oxidation and phase transformations is emphasized. Finally, the thermodynamic analysis of phase equilibrium diagrams is considered. Prerequisite: ESG 101 or ESG 201.

Fall, 3 credits

Mr. Jach

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 is also included to illustrate the methods.

Prerequisite: ESG 232.

Fall, 3 credits

Mr. Herman

ESM 326 Materials and the Environment

Interactions between materials and their environments including corrosion, oxidation, absorption and adsorption reactions. The influence of these reactions on the properties of materials, the design of materials resistant to these phenomena, alternative methods of protection and the utilization of these reactions in promoting breakdown and deterioration of materials.
Prerequisite: ESG 232.

Spring, 3 credits

ESM 328 Nuclear Technology and Materials

This course covers broadly the field of nuclear engineering and emphasizes the principles which form the basis of today's knowledge of nuclear materials. The course covers such topics as radioactivity, fission, reactor theory and materials, radiation effects and shielding, industrial applications of nuclear energy and the general use of radiation.

Fall, 3 credits
Mr. Jach

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

ESM 336 Modern Theory of Solids

A development of the modern theory of solids from the quantum nature of matter. After a review of basic concepts, the band structure of solids is derived as a consequence of the Bloch theorem. The band theory is then applied to the interpretation of the properties of metals and alloys, semi-conductors and ionic crystals. Topics include dielectric and magnetic properties, electrical and thermal conductivity and the interpretation of resonance techniques.
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

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 an electron microscope for the determination of microstructure in engineering materials. The course will be divided into two hours each of lecture and laboratory per week. 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, 3 credits

DEPARTMENT OF MECHANICS

Professors: BERLAD, BRADFIELD, CESS, IRVINE, R. S-L. LEE *(Chairman)*, O'BRIEN, STELL, TASI, C. H. YANG

Associate Professors: CHEVRAY, CHIANG, HARRIS, VARANASI, L-S. WANG

DEPARTMENTAL TECHNICAL ELECTIVES

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, UPS 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.
Prerequisites: ESG 201 and ESG 264.

Fall, 3 credits

Mr. T. F. Irvine

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 explosions. Applications to modern systems.
Prerequisite: ESG 201.

Fall, 3 credits

Mr. A. Berlad

ESC 330 Structural Analysis

Structural stability. Statically determinate and indeterminate structures. Analysis of trusses and frames in two dimensions. Transport, flexibility and stiffness matrix analysis of structures. Energy methods.

Use of influence lines for variable load conditions.
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 which 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. 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 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 photoelasticity, 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 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 maneuvering; 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 Experimental Fluid Mechanics

Operating principles and performance characteristics of instruments for measurement of geophysical quantities. Flow visualization in liquids and gases. Introduction to acoustics. Measurement and analysis of random variables. Applications to oceanographic and atmospheric measurements. Laboratory demonstration.
Prerequisite: Permission of instructor.

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.
Prerequisites: ESG 101, 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.

Fall, 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 functions and various perturbative procedures. During the latter half of the course one or more particular systems and/or problems (e.g., ionic or polar fluids, critical phenomena) are examined in some detail to illustrate the use of the general methods developed.
Prerequisites: ESG 202 and permission of instructor.

Spring, 3 credits

Mr. G. Stell

ESC 392 Dynamical Oceanography

The hydrodynamic equations in rotating systems; status and dynamics of functionless ocean currents; thermohaline circulations and frictional coupling between wind and water; radiation budget of the Northern Hemisphere; windwaves, gravitational and tidal forces, turbulent diffusion at the surface and the role of density stratification in dynamical oceanography.
Prerequisites: ESG 101 or equivalent and 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: With Applications to 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 IN URBAN AND POLICY SCIENCES

Professors: BELTRAMI, NATHANS *(Chairman)*

Associate Professors: ALTMAN, BLUM, EHLERS

Assistant Professor: BODIN

TECHNICAL ELECTIVES

UPS 301 Research in Urban and Policy Sciences

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, UPS 301) may be counted towards fulfillment of technical elective requirements.

Fall and Spring, 3 credits, repetitive

UPS 320, 321 Analysis of Public Systems

An introduction to the quantitative analysis of systems in the public sector. Topics will include: modeling and simulation of public systems; optimization techniques including linear and dynamic programming; economic factors in public systems; decision theory; structure and interaction in complex systems. Particular emphasis will be placed upon developing the student's ability to organize unstructured problems for systematic analysis and the ability to evaluate public policy alternatives. Examples will be chosen from the areas of regional planning, education, criminal justice systems and housing, among others.
Prerequisite: Permission of instructor.

Fall and Spring, 3 credits each semester

HEALTH SCIENCES CENTER

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* applicable 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. The *Health Sciences Center Bulletin* can be secured by writing or telephoning the Health Sciences Center Office of Student Services (516-444-2113) or the Office of the Dean of a specific School.

The Health Sciences Center (HSC) consists of the Schools of Allied Health Professions, Basic Health Sciences, Dental Medicine, Medicine, Nursing, and Social Welfare. These six schools are served by a Division of Health Sciences Communications, a Laboratory Animal Medicine Division, a Health Sciences Library, and the Office of Student Services.

The Clinical resources of the Health Sciences Center, in addition to a projected 600-bed University Hospital to be constructed as part of the basic health sciences megastructure, include four clinical campuses. These are the Nassau County Medical Center, the Long Island Jewish-Hillside Medical Center/Queens Hospital Center, the Veterans Administration Hospital at Northport, and the Hospital of the Brookhaven National Laboratory. In addition, the six schools have special affiliation agreements with other hospitals in the region.

In 1972-73, all of the schools, except dental medicine, were in the initial or second year of operation, and their combined student enrollment totalled over 600. By 1975-76, when Phase I of the construction program will be completed, full-time student enrollment will total almost 3000, plus more than 2000 part-time students. At the completion of Phase II construction sometime in 1978-79, the number of full-time students accommodated will increase to 3500, and part-time students to more than 3000.

Program Offerings

Current offerings include both undergraduate and post-baccalaureate programs. All undergraduate programs, with the exception of the Physicians' Associate certificate program, begin in the upper division.

In academic year 1973, the School of Allied Health Professions is offering baccalaureate degree programs in Cardiopulmonary Technology/ Respiratory Therapy; Medical Technology; Physical Therapy; and Community and School Health Education. (The School will also offer a two-year certificate program for Physicians Associates.)

Baccalaureate degree programs are also being offered by the Schools of Nursing and Social Welfare.

Also in academic year 1973, the Health Sciences Center is enrolling M.D. candidates in the School of Medicine, D.D.S. candidates in the School of Dental Medicine and masters degree candidates in the Schools of Social Welfare and Allied Health Professions (Health Services Administration). Planning has begun in each of the schools for additional undergraduate, graduate and post-baccalaureate programs to be added as the Health Sciences Center expands in the coming years.

Admissions

Procedures

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 55 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 undergradutae programs is *not* simply a "change of major."

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.

Applicants to the two-year Physicians' Associate certificate program need not have completed any formal college work but are expected to be able to undertake instruction at an upper-division college level. A prerequisite unique to this program is at least one full year of participation in the delivery of health care.

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(one vacancy)

STATE UNIVERSITY OF NEW YORK AT STONY BROOK

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Director of Internal Audit

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Assistant Vice President for Student Affairs

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Acting Associate Dean, College of Engineering

ERNEST CHRISTENSEN, A.A., B.S., M.A.
Director of the Stony Brook Union; Administrator, Faculty Student Senate

DAVID W. D. DICKSON, A.B., A.M., Ph.D.
Dean of Continuing and Developing Education

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Assistant Academic Vice President for Undergraduate Studies

GEORGE G. FOGG, A.B., M.S., Ph.D.
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REX G. FRANCIOTTI, B.S., M.E.
Director of the Computing Center

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Associate Dean for Admissions

JOSEPH GANTNER, A.B., M.A., M.L.S.
Acting Director of Libraries

JOSEPH HAMEL, B.B.A., M.A.
Assistant Vice President for Finance and Management; Business Manager; Acting Director of Physical Plant

CARL E. HANES, JR., B.S.C.
Assistant Vice President for Finance and Management; Controller

CHARLES HOFFMANN, B.A., M.A., Ph.D.
Assistant Academic Vice President for Resource Planning and Utilization

RAYMOND F. JONES, B.Sc., Ph.D.
Provost, Biological Sciences; Acting Director, Marine Sciences Research Center

HARRY KALISH, B.A., M.A., Ph.D.
Acting Dean for Professional and Para-Professional Programs

JOSEPH P. KIMBLE, A.A.
Director of Security, Special Assistant to the Executive Vice President

EDWARD LAMBE, B.Ap.Sc., M.Ap.Sc., Ph.D.
Director of the Instructional Resources Center

JOSEPH MCCONKEY, B.B.A.
Assistant Vice President for Finance and Management; Director of Management Systems

JAMES MCKENNA, B.A., M.A., Ph.D.
Assistant Academic Vice President for Liberal Studies

RALPH MORRISON, B.A., M.A.
Dean for Student Relations; Director of International Student Affairs

ROBERT MOELLER, B.A., M.A.
Acting Assistant Vice President for Student Affairs

ROGER PHELPS, B.S., M.S.
Director, University Housing

VERA RONY, B.S., M.A.
Assistant Executive Vice President for Equal Opportunity and Director, Division of Regional Studies and Projects, Economic Research Bureau

MAX B. ROSSELOT, A.B., A.M.
Dean for Student Administrative Services

R. W. SIEGEL, B.S.
Assistant Executive Vice President

JEROME E. SINGER, B.A., Ph.D.
Associate Dean of the Graduate School

WILLIAM STROCKBINE, A.B.
Associate Dean for University Records

GARY L. THOMAS, B.S., M.A., Ph.D.
Associate Dean for Research

JOHN G. TRUXAL, A.B., B.S., Sc.D.
Dean, College of Engineering

CHARLES R. WAGNER, A.B.Arch.
Director of Facilities Planning

HERBERT WEISINGER, A.B., M.A., Ph.D.
Dean of the Graduate School

DAVID WOODS, B.A., M.A.
Director of University Relations

FACULTY, COLLEGE OF ARTS AND SCIENCES AND COLLEGE OF ENGINEERING

This faculty listing contains the teaching faculty and their academic positions as of March 15, 1973.

KENNETH T. ABRAMS
Associate Professor of English
B.A., Washington and Jefferson College; Ph.D., Cornell University

ADELE ADDISON
Performing Artist in Residence and Part-time Lecturer, Department of Music

B.M., Westminster Choir College, New England Conservatory of Music

ALFRED ADLER
Professor of Mathematics
S.B., Massachusetts Institute of Technology; Ph.D., University of California at Los Angeles

ERALP A. AKKOYUNLU
Assistant Professor of Engineering
B.S.E.E., M.S.E.E., Ph.D., Columbia University

ASANO ALBERTSON
Assistant Librarian, Acquisitions
B.A., University of Hawaii; M.L.S., Carnegie Library School

JOHN M. ALEXANDER
Professor of Chemistry
B.S., Davidson College; Ph.D., Massachusetts Institute of Technology

PER A. ÅLIN
Associate Professor of History
B.A., University of Stockholm; M.A., University of Chicago; Ph.D., University of Vienna

PHILIP B. ALLEN
Assistant Professor of Physics
B.A., Amherst College; Ph.D., University of California, Berkeley

HARRIET R. ALLENTUCH
Associate Professor of French
B.A., University of Rochester; M.A., Radcliffe College; Ph.D., Columbia University

DAVID B. ALLISON
Instructor in Philosophy
B.A., University of Montana; M.A., Pennsylvania State University

LAWRENCE ALLOWAY
Professor of Art and Director of Art Gallery
Art Critic, and Former Curator of Solomon R. Guggenheim Museum

THOMAS J. J. ALTIZER
Professor of English and Chairman, Religious Studies Program
B.A., A.M., Ph.D., University of Chicago

LAWRENCE JAY ALTMAN
Associate Professor of Chemistry
B.S., California Institute of Technology; Ph.D., Columbia University

STANLEY M. ALTMAN
Associate Professor of Urban and Policy Sciences
B.E.E., City College of New York; M.S.E.E., Purdue University; Ph.D., Polytechnic Institute of Brooklyn

DONNA AMARIGLIO
Assistant Librarian, Reference
A.B., Cornell University; M.L.S., Columbia University

EDWARD AMES
Professor and Chairman, Department of Economics
B.A., A.M., M.P.A., Ph.D., Harvard University

OAKES AMES
Professor and Chairman, Department of Physics
B.A., Harvard University; Ph.D., Johns Hopkins University

RONALD ANDERSON
Performing Artist in Residence and Part-time Lecturer, Department of Music
B.M.E., Central Missouri State College; B.S., M.S., Juilliard School of Music; M.A., Ed.D., Columbia University

WERNER T. ANGRESS
Professor of History
B.A., Wesleyan University; M.A., Ph.D., University of California, Berkeley

DOMINIC ANNACONE
Lecturer in Education
B.S., M.S., State University College of New York at New Paltz; Certificates: Elementary Education NYS, Administration NYS

FRANK ANSHEN
Assistant Professor of English and Chairman, Linguistics Program
B.A., University of California, Berkeley; Ph.D., New York University

BULENT AREL
Professor of Music
State Conservatory of Ankara

WILLIAM ARENS
Assistant Professor of Anthropology
B.A., Long Island University; Ph.D., University of Virginia

[d]AKITO ARIMA
Visiting Professor of Physics
B.S., D.Sc., University of Tokyo

NORMAN ARNHEIM, JR.
Assistant Professor of Biological Sciences
B.A., M.S., University of Rochester; Ph.D., University of California, Berkeley

LEONARD AUERBACH
Associate Professor and Chairman, Department of Theatre Arts

KOFI AWOONOR
Assistant Professor of English
B.A., M.A., University of London

JAMES AX
Professor of Mathematics
B.S., Polytechnic Institute of Brooklyn; Ph.D., University of California, Berkeley

MIRIAM BAKER
Assistant Professor of English
B.A., Smith College; M.A., Ph.D., State University of New York at Stony Brook

NANDOR L. BALAZS
Professor of Physics
M.A., Scientific University of Budapest; Ph.D., University of Amsterdam

WILLIAM D. BARCUS
Professor of Mathematics
S.B., Massachusetts Institute of Technology; Ph.D., Oxford University

JACQUELINE BARNITZ
Part-time Lecturer in Art
Institut Michot, Brussels; New School for Social Research

SAMUEL BARON
Associate Professor of Music
B.S., Juilliard School of Music; Pupil of Georges Barrere and Arthur Lora

PATRICK E. BARRY
Assistant Professor of Engineering
B.E., M.S., Ph.D., State University of New York at Stony Brook

BRUCE W. BASHFORD
Assistant Professor of English
B.A., University or Rochester; M.A., Ph.D., Northwestern University

ALEX BASKIN
Assistant Professor of Education
B.A., M.A., Ed.D., Wayne State University

BARBARA BASKIN
Assistant Professor of Education
B.A., Wayne State University; M.A., University of Michigan; Ed.D., Wayne State University

EDWIN H. BATTLEY
Associate Professor of Biological Sciences
B.A., Harvard University; M.S., Florida State University; Ph.D., Stanford University

EDWARD R. BAYLOR
Professor of Biological Sciences and Member, Marine Sciences Research Center
B.S., M.S., University of Illinois; Ph.D., Princeton University

NICOLE BECKER
Instructor in French
B.A., M.A., Hofstra University

RUTH R. BEIZER
Instructor in Linguistics
B.A., Hebrew University, Jerusalem; M.R.E., Jewish Theological Seminary

EDWARD J. BELTRAMI
Professor of Engineering
B.S., Polytechnic Institute of Brooklyn; M.S., New York University; Ph.D., Adelphi University

A. EDWARD BENCE
Associate Professor of Petrology
B.S., University of Saskatchewan; M.A., University of Texas; Ph.D., Massachusetts Institute of Technology

DAVID W. BENFIELD
Assistant Professor of Philosophy
B.A., St. John's College; M.A., Ph.D., Brown University

BETTY T. BENNETT
Adjunct Assistant Professor of Comparative Literature
B.A., Brooklyn College; M.A., Ph.D., New York University

[c]JOSEPH T. BENNETT
Associate Professor and Director of M.A. Program, Department of English

B.A., New School for Social Research; M.A., Ph.D., New York University

CATHERINE BENNIDES
Associate Librarian, Cataloging
B.S., Queens College; M.L.S., University of Pittsburgh

ABRAHAM L. BERLAD
Professor of Engineering
B.S., Brooklyn College; Ph.D., Ohio State University

GRETA BERMAN
Lecturer in Art
B.A., Antioch College; M.A., University of Stockholm

ARTHUR J. BERNSTEIN
Associate Professor of Engineering
B.A., M.S., Ph.D., Columbia University

SAMUEL BERR
Associate Professor of Germanic and Slavic Languages
B.S., City College of New York; M.A., Ph.D., New York University

JAMES L. BESS
Adjunct Assistant Professor of Education and Member, Research Group for Human Development and Educational Policy
B.A., Cornell University; M.B.A., Harvard University; M.A., New York University; Ph.D., University of California, Berkeley

LEBERT BETHUNE
Assistant Professor in the Black Studies Program
B.S., New York University; M.A., Columbia University

KONRAD BIEBER
Professor of French and Comparative Literature
License, Paris; Ph.D., Yale University

[c]JOHN C. BILELLO
Associate Professor of Engineering
B.Met.E., M.S., New York University; Ph.D., University of Illinois

BEVERLY BIRNS
Associate Professor of Education
M.A., University of Geneva; Ph.D., Columbia University

DONALD BLACKMAN
Assistant Professor and Chairman, Black Studies Program
B.L., Lincoln's Inn School of Law; B.A., York University; M.A., New York University

RICHARD D. BLOOM
Lecturer in Education
B.A., M.A., Wayne State University; Ph.D., University of Michigan

CAROL BLUM
Assistant Professor of French
B.A., Washington University; M.A., Ph.D., Columbia University

MARTIN BLUME
Part-time Professor of Physics
A.B., Princeton University; A.M., Ph.D., Harvard University

LAWRENCE D. BODIN
Associate Professor of Engineering
A.B., Northeastern University; M.S., Ph.D., University of California, Berkeley

DAVID BOLOTINE
Associate Librarian, Cataloging
B.A., New York University; M.L.S., Pratt Institute

ROGER BOND
Instructor in Theatre Arts
B.S., University of Rhode Island; M.A., University of Delaware

FRANCIS BONNER
Professor of Chemistry
B.A., University of Utah; M.S., Ph.D., Yale University

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STATE UNIVERSITY OF NEW YORK

GENERAL STATEMENT

State University of New York, which celebrates its 25th anniversary in 1973, is unique in its organization and the breadth of its educational mission. It is the largest coordinated, centrally managed multi-level system of public higher education in the nation.

In a recent report to the University's Trustees, Chancellor Ernest L. Boyer 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 film, 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."

Since its founding in 1948, the State University has grown from 29 State-supported but unaffiliated campuses into an organized system of higher education comprising 72 institutions which enrolled over 226,000 full-time and 125,000 part-time students in academic 1972-73.

Specifically, the University encompasses 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; and 38 locally-sponsored community colleges. Together, they offer students a choice of more than 3,100 academic specializations, representing more than 1,500 different degree programs. Twelve of the campuses offer graduate study at the doctoral level, 22 at the masters level.

Advanced degree study encompasses a wide spectrum, including agriculture, business administration, criminal justice, dentistry, education, engineering, forestry, life and physical sciences, medicine, nursing, optometry, pharmacy and veterinary medicine.

Four-year programs emphasize the liberal arts and sciences and include such specializations as teacher education, business, forestry, physical education, maritime service, ceramics and the fine and performing arts.

The two-year colleges offer associate degree opportunities in arts and science and in technical areas such as agriculture, business, civil technology, data processing, police science, nursery education, nursing, medical laboratory technology and recreation supervision. The two-year colleges also provide transfer programs within the University for students wishing to continue study toward a baccalaureate degree.

Responding to the needs of New York State's economically and educationally disadvantaged, State University has also established six urban centers and six cooperative college centers. The former provide training for skilled and semi-skilled occupations as well as college foundation courses for youths and adults in inner-city areas. The latter combine the resources of public and private colleges within a region in a joint effort to prepare students for full-time college programs.

Educational innovation has from the first been a University watchword.

With funding support from a private educational foundation, five of the University's senior campuses are experimenting with programs to shorten substantially the traditional four-year period of baccalaureate study.

Empire State College, the 72nd and newest institution, is a non-residential college whose students earn degrees without being attached to a specific campus or attending traditional classes. Its coordinating center at Saratoga Springs reaches out to students through regional learning centers.

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 38 community colleges operating under the program of State University have their own local boards of trustees. The State contributes one-third to 40 per cent 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
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
Upper Division College

NON-RESIDENTIAL COLLEGE

Empire State College at Saratoga Springs

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)

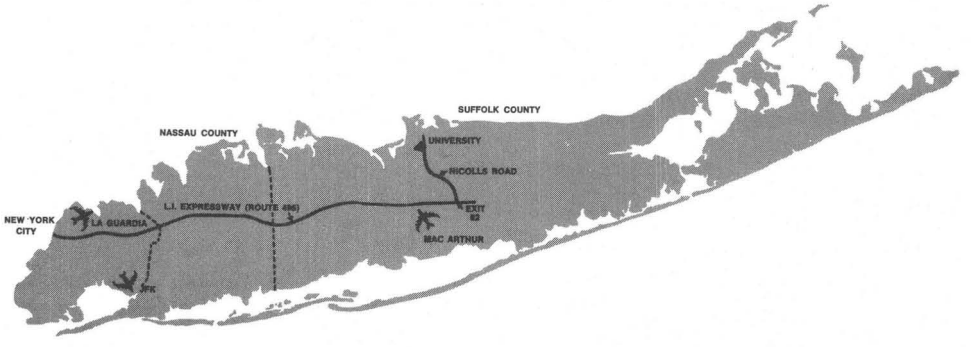
Alfred
Canton
Cobleskill
Delhi
Farmingdale
Morrisville

STATUTORY COLLEGES

College of Ceramics at Alfred University
College of Agriculture and Life Sciences at Cornell University
College of Human Ecology at Cornell University
School 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



TRANSPORTATION TO STONY BROOK

By Air

Stony Brook is located ten miles from Long Island-MacArthur Airport and 50 miles from Kennedy International and LaGuardia Airports.

By Car

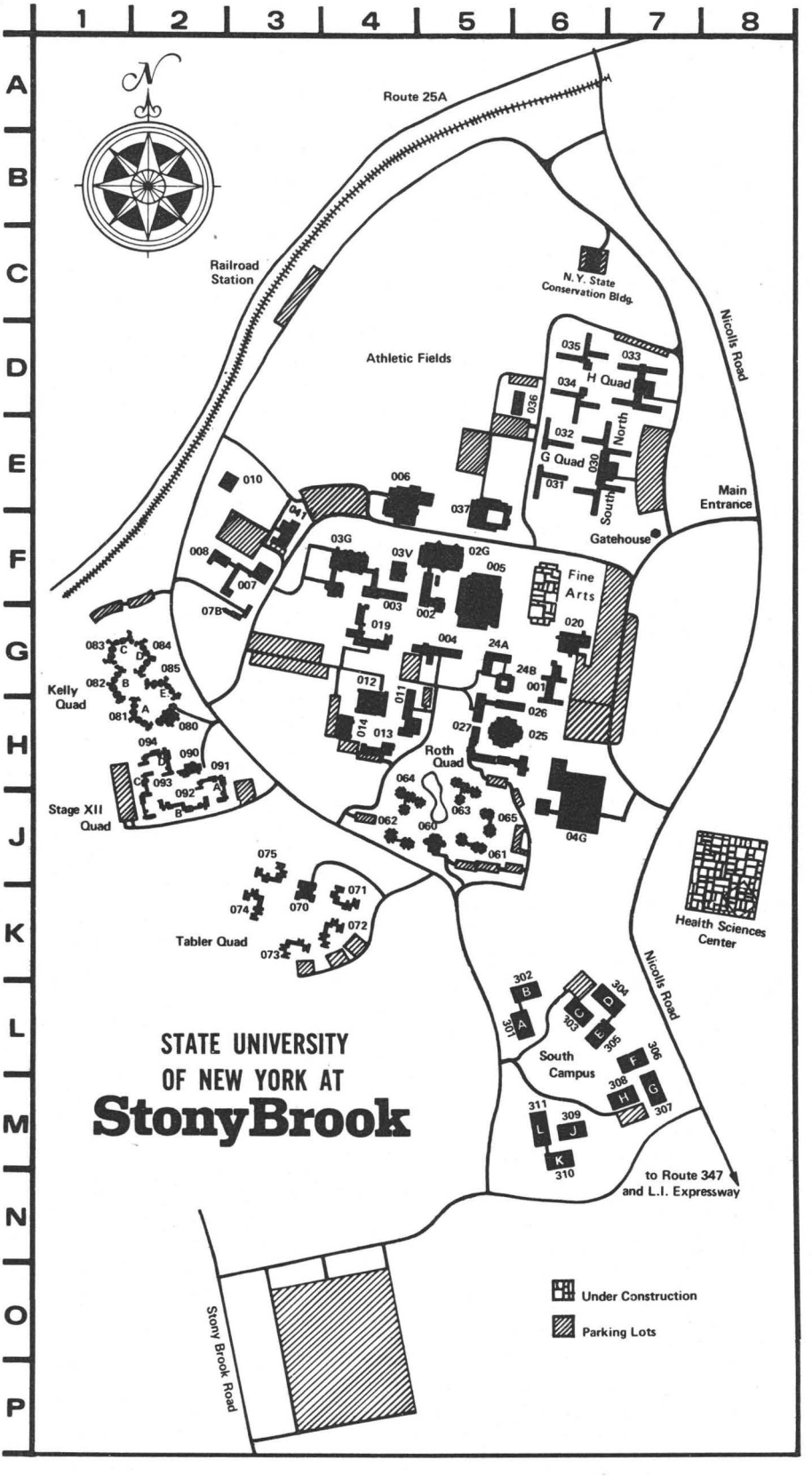
Take the Long Island Expressway (Route 495) east from the Queens-Midtown Tunnel in Manhattan. Leave Expressway at Exit 62 and follow Nicolls Road north for nine miles. Turn left at the main entrance to the University and stop at the gatehouse for a parking permit.

By Railroad

Take the Long Island Railroad'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.

CAMPUS GUIDE

Official Bldg. No.	Building Index	Map Location
020	Administration Building	G 6
032	Ammann College (G Quad)	E 6
082	Baruch College (Kelly Quad)	G 1
033	Benedict College (H Quad)	D 7
04G	Biological Sciences Graduate Bldg.	J 6
004	Biology Building	G 5
062	Cardozo College (Roth Quad)	J 4
002	Chemistry Building	F 5
02G	Chemistry Graduate Building	F 5
041	Commissary	F 3
014	Computing Center	H 4
081	Dewey College (Kelly Quad)	H 1
072	Douglass College (Tabler Quad)	K 4
073	Dreiser College (Tabler Quad)	K 3
019	Earth and Space Sciences Building	G 4
083	Eisenhower College (Kelly Quad)	G 1
010	Electric Sub-Station	E 3
011	Engineering Building	H 4
013	Engineering Heavy Laboratory	H 4
012	Engineering Light Laboratory	G 4
	Fine Arts	G 6
030	G-Cafeteria	E 6
07B	Garage	G 2
	Gatehouse	F 7
065	Gershwin College (Roth Quad)	J 5
031	Gray College (G Quad)	E 6
093	Greeley College (Stage XII Quad)	J 2
006	Gymnasium	E 4
033	H-Cafeteria	D 7
085	Hamilton College (Kelly Quad)	G 2
071	Hand College (Tabler Quad)	K 4
	Health Sciences Center	J 8
008	Heating Plant	F 2
063	Henry College (Roth Quad)	J 5
001	Humanities Building	G 6
036	Infirmary	D 5
026	Instructional Resources Center	H 6
030	(South) Irving College (G Quad)	E 6
034	James College (H Quad)	D 6
092	Keller College (Stage XII Quad)	J 2
080	Kelly Cafeteria	H 2
027	Laboratory-Office Building	H 5
035	Langmuir College (H Quad)	D 6
025	Lecture Hall Center	H 6
005	Library, Frank Melville Jr. Memorial	F 5
064	Mount College (Roth Quad)	H 4
030	(North) O'Neill College (G Quad)	E 6
003	Physics Building	F 4
03G	Physics/Math Graduate Building	F 4
060	Roth Cafeteria	J 5
074	Sanger College (Tabler Quad)	K 3
084	Schick College (Kelly Quad)	G 2
007	Service Building	F 3
24A	Social Sciences Laboratory	G 5
24B	Social Sciences Office	G 6
301	South Campus A	L 6
302	South Campus B	L 6
303	South Campus C	L 6
304	South Campus D	L 7
305	South Campus E	L 6
306	South Campus F	L 7
307	South Campus G	M 7
308	South Campus H	M 7
309	South Campus J	M 6
310	South Campus K	M 6
311	South Campus L	M 6
090	Stage XII Cafeteria	H 2
091	Stimson College (Stage XII Quad)	H 2
037	Stony Brook Union	E 5
070	Tabler Cafeteria	K 3
302	Theatre (South Campus B)	M 6
075	Toscanini College (Tabler Quad)	J 3
03V	Van de Graaff Accelerator	F 4
094	Wagner College (Stage XII Quad)	H 2
007	Warehouse	G 2
061	Whitman College (Roth Quad)	J 5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Route 25A
Railroad Station
N.Y. State Conservation Bldg.
Athletic Fields
Nicolls Road
H Quad
North
South
G Quad
Main Entrance
Gatehouse
Fine Arts
Kelly Quad
Roth Quad
Stage XII Quad
Tabler Quad
Health Sciences Center
South Campus
STATE UNIVERSITY
OF NEW YORK AT
StonyBrook
to Route 347
and L.I. Expressway
Stony Brook Road
Under Construction
Parking Lots

Index

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