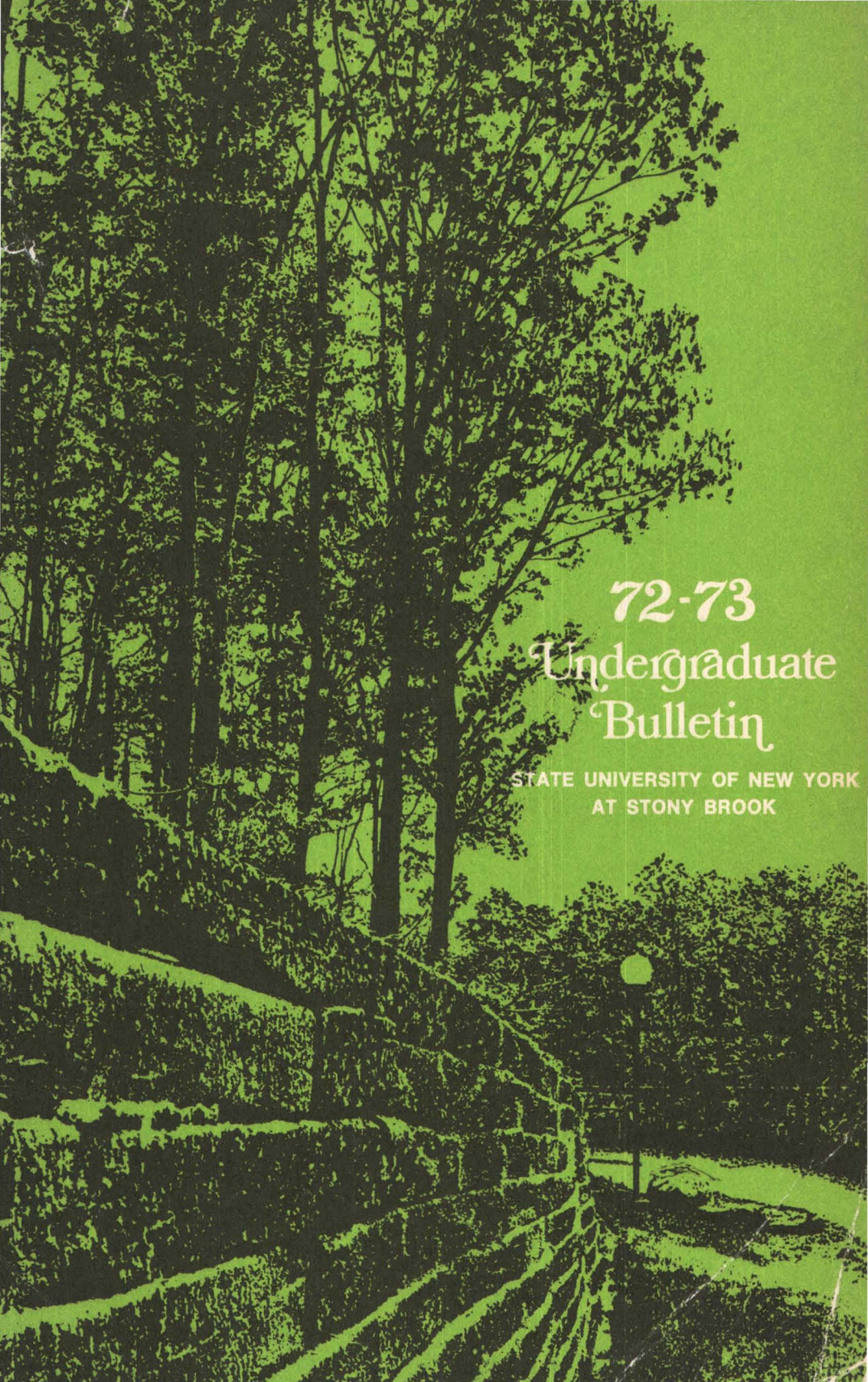
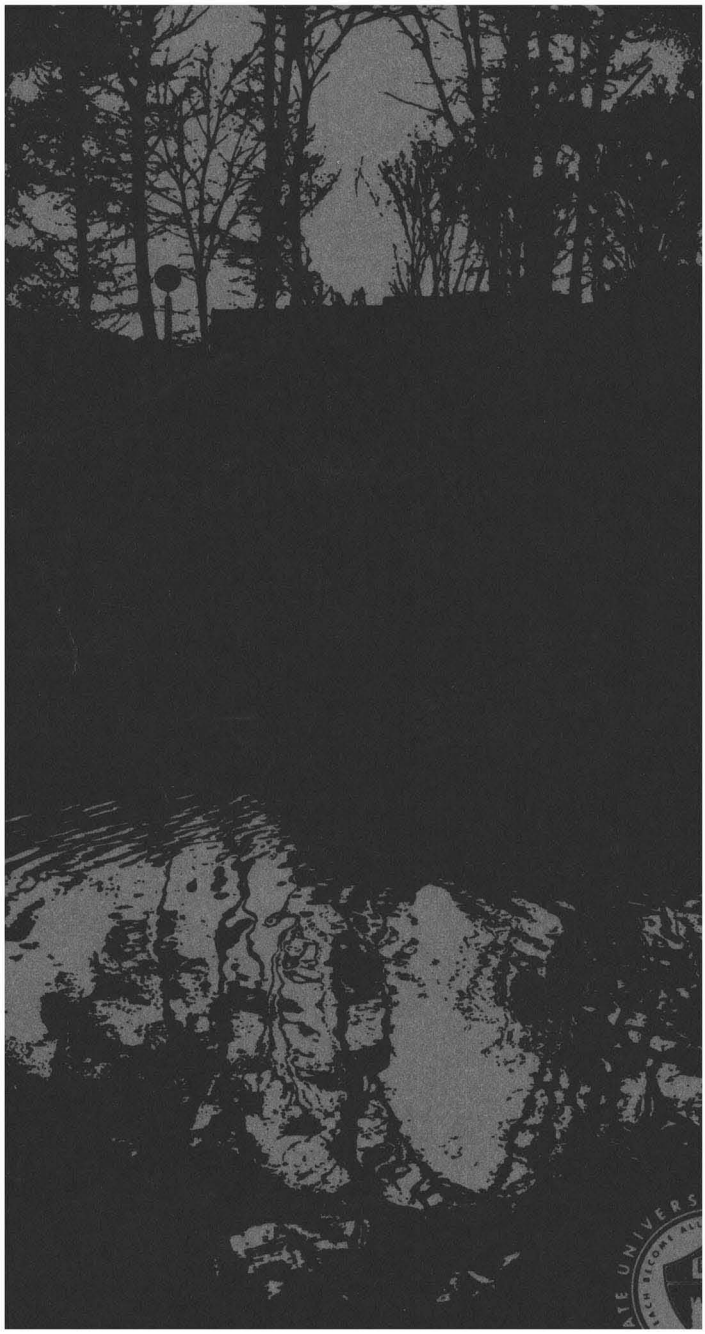


72-73 Undergraduate Bulletin

STATE UNIVERSITY OF NEW YORK
AT STONY BROOK



72-73 Undergraduate Bulletin

STATE UNIVERSITY OF NEW YORK
AT STONY BROOK

This book is printed on recycled paper.
Photographs in this edition of the Undergraduate Bulletin *have been taken by undergraduate students, capturing campus scenes as they have experienced them.*
Covers and inside front cover photos by Jook Leung

Photo by Jook Leung

VOLUME X
Press Date March 15, 1972
State University of New York at Stony Brook

Address and Phone

The mailing address of the University is:
State University of New York at Stony Brook
Stony Brook, New York 11790
The general telephone number is:
(516) 246-5000.

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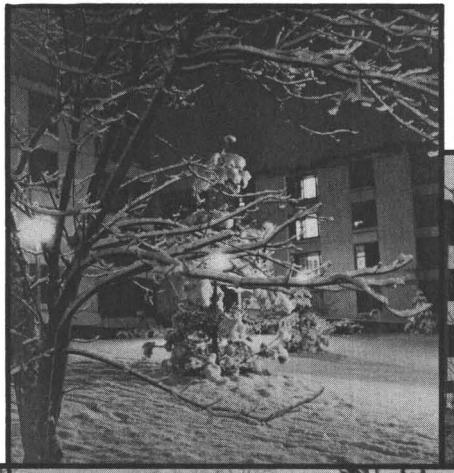
Jook Leung



Roy Morris

Roy Morris

Roy Morris

Jook Leung

ACADEMIC CALENDAR
1972-73

Fall Semester 1972

August 27, Sunday	Foreign Students Must Arrive
August 28, Monday	All Residence Halls Open
August 28-September 5 Monday-Tuesday	Foreign Student Orientation
August 29-August 30 Tuesday-Wednesday	Graduate Student Registration
August 30-September 2 Wednesday-Saturday	Orientation and Registration—Undergraduates
September 4, Monday	Labor Day Recess
September 5, Tuesday	Classes Begin—Late Registration Period Begins; Last Day for Students to Complete Payment of All Fees to Complete Registration
September 9-10 Saturday-Sunday	Rosh Hashanah Recess (No classes from 5 p.m. Friday, Sept. 8 to 5 p.m. Sunday, Sept. 10)
September 18, Monday	Yom Kippur Recess (No classes from 5 p.m. Sunday, Sept. 17 to 5 p.m. Monday, Sept. 18)
September 19, Tuesday	End of Late Registration Period—All Students; Last Day to Add a Course—Undergraduates; Last Day for Students to Complete Payment of All Fees in Order to Complete Late Registration

October 3, Tuesday	Last Day for Graduates to Add or Drop a Course Last Day to Change Courses to or from P/NC (Pass/No Credit)
November 1, Tuesday	Last Day for Removal of Incompletes from Spring Semester and Summer Session for All Students
November 7, Tuesday	Last Day for Undergraduates to Drop Courses Without Penalty
November 6-10 Monday-Friday	Advance Registration for Spring Semester for Graduates and Undergraduates (except CED Students)
November 22, Wednesday	Thanksgiving Recess Begins at Close of Classes
November 27, Monday	Classes Resume
December 15, Friday	Last Day of Classes
December 18, Monday	Final Examinations Begin
December 22, Friday	Final Examinations End—Fall Semester Ends; Last Day for Graduates to Submit Theses and Dissertations for December Graduation
December 24, Sunday	All Residence Halls Closed
January 3, Wednesday	Final Grades Due in Registrar's Office—12 Noon

Spring Semester 1973

January 8, Monday	All Residence Halls Open
January 9, Tuesday	Foreign Students Expected to Arrive
January 11-12 Thursday-Friday	Graduate Registration
January 11-14 Thursday-Sunday	Orientation and Final Registration for Undergraduates Not Pre-registered

January 15, Monday	Classes Begin—Late Registration Period Begins; Last Day for Students to Complete Payment of All Fees to Complete Registration
January 29, Monday	Last Day to Add a Course—Undergraduates; End of Late Registration Period—All Students; Last Day for Students to Complete Payment of All Fees in Order to Complete Late Registration
February 12, Monday	Last Day for Graduates to Add or Drop a Course Last Day to Change Courses to or from P/NC (Pass/No Credit)
March 15, Thursday	Last Day for Removal of Incompletes from Fall Semester for All Students
March 19, Monday	Last Day for Undergraduates to Drop Courses Without Penalty
April 9-13 Monday-Friday	Advance Registration for Fall Semester and Summer Session for Graduates and Undergraduates (except CED Students)
April 14, Saturday	Spring Recess Begins at Close of Classes
April 23, Monday	Classes Resume
April 23, Monday	Last Day for Graduates to Submit Theses and Dissertations for May Graduation
May 15, Tuesday	Last Day of Classes
May 16-17 Wednesday-Thursday	Reading and Review Days
May 18, Friday	Final Examinations Begin
May 25, Friday	Final Examinations End—Spring Semester Ends
May 27, Sunday	Commencement
May 28, Monday	Final Grades Due in Registrar's Office—12 Noon Final Closing All Residence Halls

Summer Session 1973

June 25, Monday	Final Registration
June 26, Tuesday	Classes Begin
August 3, Friday	Classes End—Summer Session Ends
August 17, Friday	Last Day for Graduates to Submit Theses and Dissertations for August Graduation

Fall Semester 1973 (Tentative)

August 27, Monday	All Residence Halls Open
September 4, Tuesday	Classes Begin—Late Registration Period Begins
December 14, Friday	Last Day of Classes
December 17, Monday	Final Examinations Begin
December 21, Friday	Final Examinations End—Fall Semester Ends

Spring Semester 1974 (Tentative)

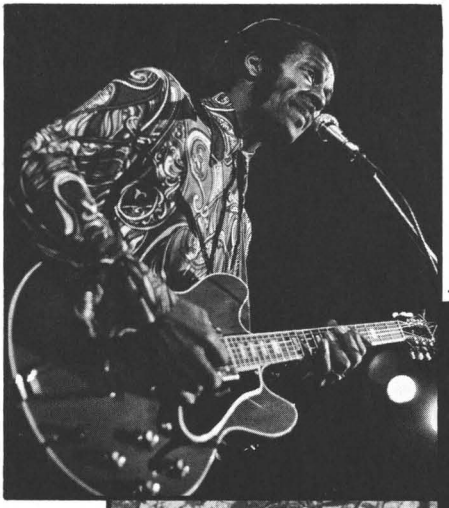
January 14, Monday	Classes Begin—Late Registration Period Begins
May 15, Wednesday	Last Day of Classes
May 16, Thursday	Final Examinations Begin
May 24, Friday	Final Examinations End—Spring Semester Ends
May 26, Sunday	Commencement

Summer Session 1974 (Tentative)

June 24, Monday	Final Registration
June 25, Tuesday	Classes Begin
August 2, Friday	Classes End—Summer Session Ends

Students enrolled in undergraduate and graduate programs in the Health Sciences Center follow a different academic calendar geared to the demands of professional education.

Mark Sherman



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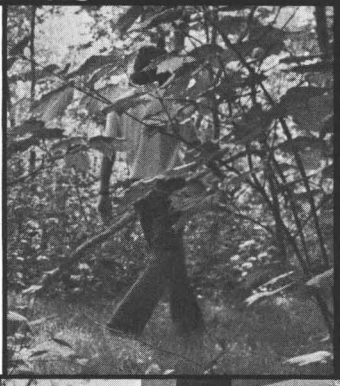

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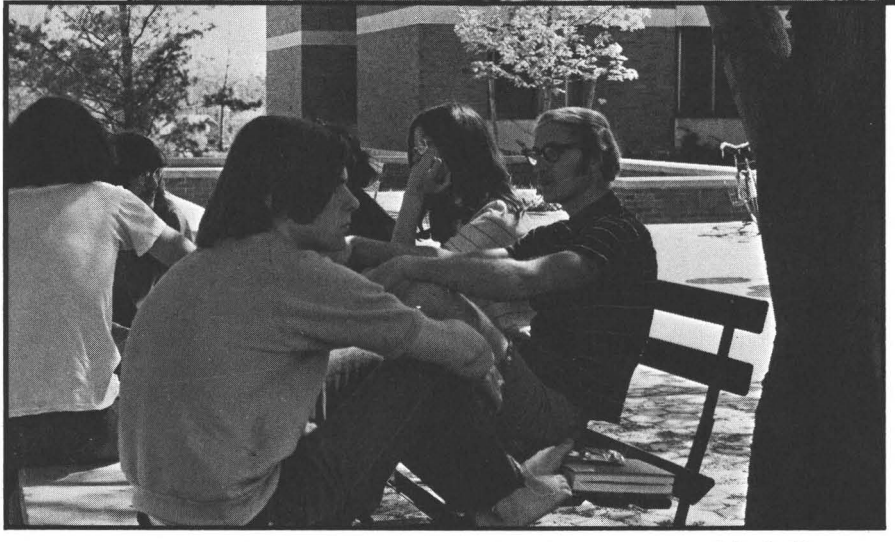
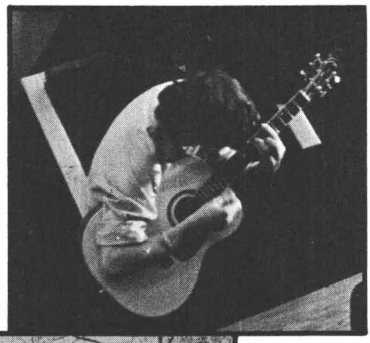


Mark Sherman



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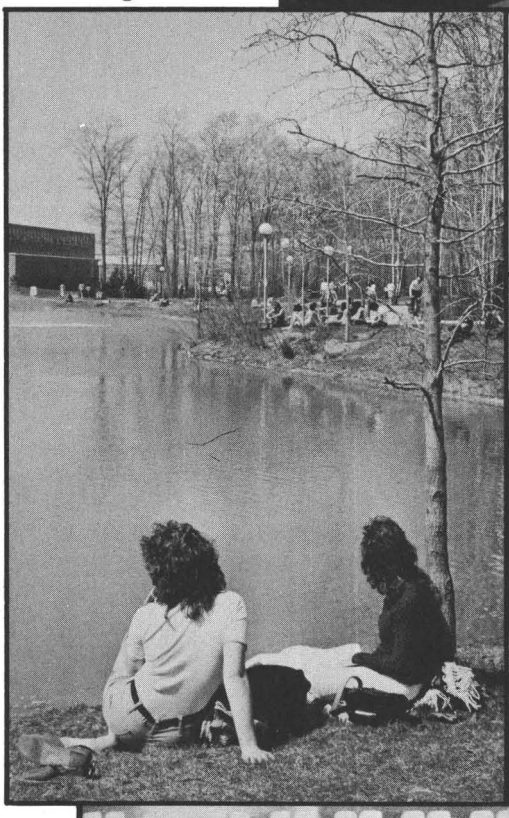


Jook Leung

Larry Rubin

AN INTRODUCTION TO STONY BROOK

The Stony Brook Campus

Stony Brook is on the North Shore of Long Island, 50 miles east of New York City; it is minutes away from the coves and beaches of Long Island Sound and about 20 miles north of the Atlantic Ocean. The University was founded in 1957 at Oyster Bay, Long Island, as a State University College for secondary school teachers of science and mathematics. Three years later, in the context of a rapidly developing State University system, it was designated a comprehensive university center. The campus was moved in 1962 from Oyster Bay to a 480-acre tract given to the state by Stony Brook conservationist and philanthropist Ward Melville. One of four university centers in the 70-campus State University of New York, Stony Brook has had 72 buildings erected since 1962 with the campus expanded to 1100 acres.

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 planned. 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 26 residential colleges within five quadrangles that house 6000 students. The residential quadrangles provide 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.

More than $300 million worth of construction is under way at Stony Brook. The 17-level, permanent home for the Health Sciences Center is being built across Nicolls Road from the main campus and will open for classes in 1973, though all hospital and clinical facilities are not due until 1976-77. Opposite the new center, on the southeast rim of the core campus, a Graduate Biology Building—with laboratories, lecture halls, a library and a greenhouse—is under construction. Northwest of the Library, a new Physics Building and a Mathematics Building are under construction. The Fine Arts Building, planned just northeast of the Library, will house the Departments of Music, Art, and Theatre Arts.

In academic programs, Stony Brook seeks to give undergraduates extensive flexibility in their pursuit of their bachelors degree. As detailed later in this *Bulletin* (see pg. 53), students may elect one of 24 major fields of study in the arts or sciences, one of six health sciences degree programs, one of nine broadly diversified interdisciplinary programs or —most flexible of all—they may simply major in liberal arts. Engineering students, while benefiting from the diversity of five graduate departments, all receive the same engineering degree.

Students

The 1972 enrollment of some 12,500 students included about 7100 undergraduates and 4300 graduate students—2500 of whom were enrolled in the evening Center for Continuing Education, chiefly for working adults, that leads to a Master of Arts in Liberal Studies degree. Another 1100 students attend the four Stony Brook-administered cooperative colleges, which are located in Glen Cove, Hempstead, Roosevelt, and Wyandanch and provide remedial and freshman-level courses for persons seeking to re-enter the educational mainstream.

Faculty

To its faculty of about 900, 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.

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 about 700,000 volumes at present, and plans call for the addition of new volumes to the collections at the rate of 100,000 volumes each year. The libraries subscribe to approximately 6200 periodical titles. Specialized departments in the Melville Library include the microforms collection and reading room, the music library and listening facility, the government documents collection and reading room, the environmental information service and the department of special collections.

Computing Center

The Computing Center is located in the Engineering Quadrangle. The IBM 360-67 computer complex provides concurrent batch processing for student and faculty research work and for administrative data processing. In conjunction with the Center's increasing services as a regional resource, a PDP-10 computing system was recently added to serve the interactive requirements of Stony Brook and other-campus users. Short courses in programming are held periodically for all users.

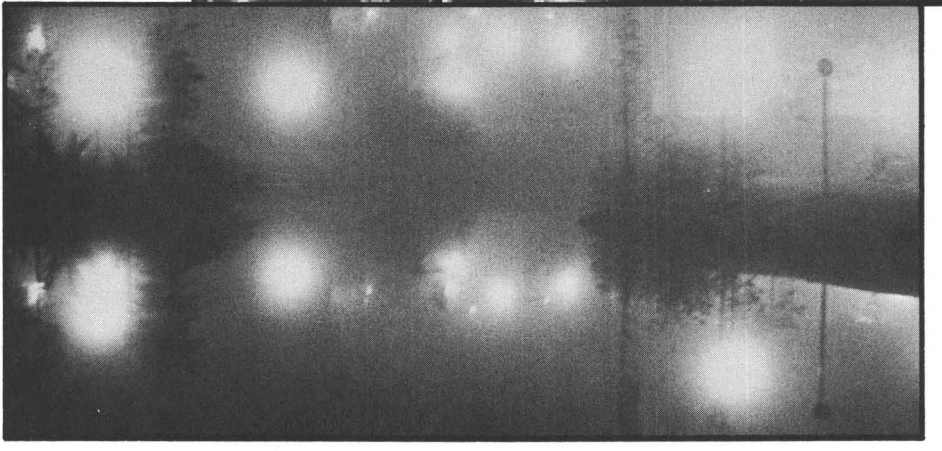
Special Centers and Institutes

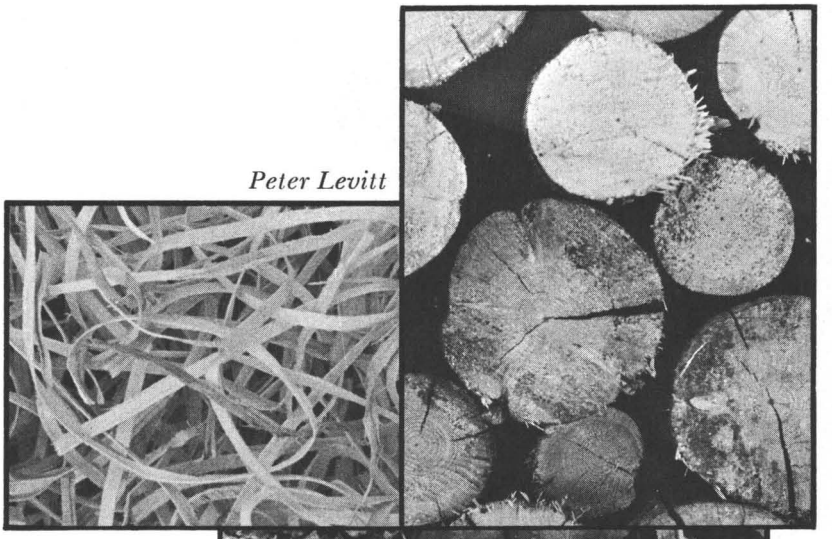
The *Marine Sciences Research Center,* which administers statewide research projects, offers research cruises, and performs studies in oceans, bays, harbors, lakes and a university-owned tidal salt marsh near campus; the *Center for Curriculum Development* generates new kinds of courses for elementary 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; 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; and the *Research Group for Human Development and Educational Policy* comprised of undergraduates, graduates, and faculty aims, on the basis of research, to make recommendations for policies, program planning and change. Newly affiliated with Stony Brook is the *Institute for Advanced Studies of World Religions* which will house a collection of more than 20,000 reference volumes.

Marcia Prager

Steve Meyer

Jook Leung





Peter Levitt

Peter Levitt

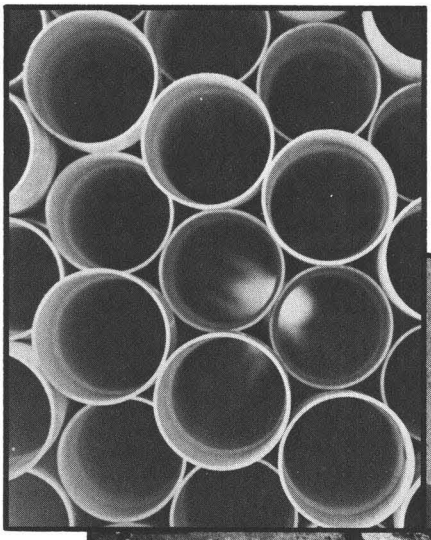
Mark Sherman

Larry Grill

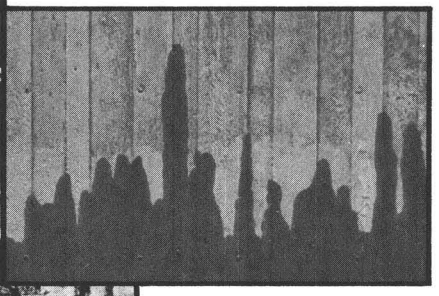
Peter Levitt

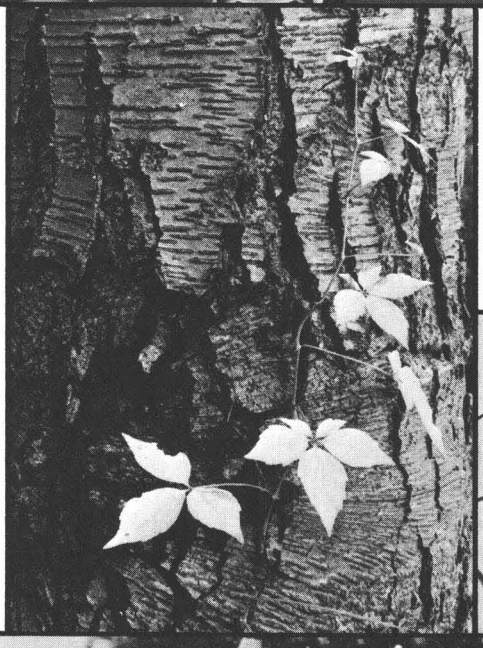
Larry Rubin

Peter Levitt



Peter Levitt





Mark Sherman

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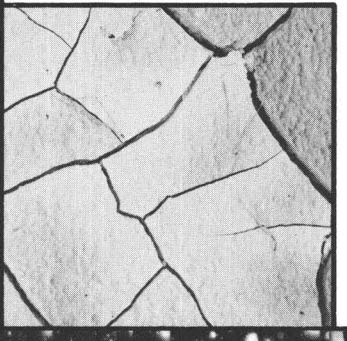

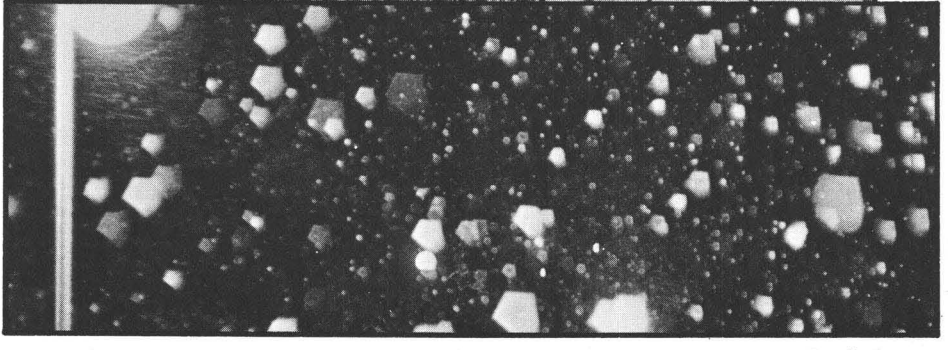

Jook Leung

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, cellular and comparative biology, chemistry, computer science, earth and space sciences, ecology and evolution, economics, education, English, French, Germanic and Slavic languages and literature, Hispanic languages and literature, Italian, history, mathematics, music, philosophy, political science, psychology, sociology, 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. A faculty board of advisors helps 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 science consists of intensive study in the basic sciences of mathematics, physics, and chemistry as well as comprehensive work in the engineering sciences of applied mathematics, mechanics, thermodynamics, electrical systems, properties of matter, and engineering design. In addition, the curriculum embraces broad training in the arts and humanities, social and behavioral sciences, and communications.

Traditional engineering departmental designations such as "civil" or "electrical" engineering are avoided at Stony Brook, with all engineering students considered responsible for mastering broad areas of knowledge which are fundamental to all of engineering science. Some specialization in particular engineering areas is provided in the senior year through elective courses and senior projects. In addition to elective courses for specialization, there are also sequences of courses of an interdepartmental nature, such as bioengineering and urban and policy science.

Engineering experiences in the last decade have indicated that engineers today must have a new depth and breadth of scientific knowledge to cope with the problems of a rapidly changing technology. The undergraduate engineering program is designed to provide this fundamental scientific background and to develop engineers who can creatively translate the knowledge of basic science into engineering results, while taking into consideration the economic and social factors.

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

Graduate Programs

Graduate study is offered in 23 of Stony Brook's present 28 academic departments, as well as in three of the six schools of the Health Sciences Center, and the Center for Continuing Education. The Ph.D. degree is offered through 19 departments, the M.A. through 14, and the M.S. through seven. There are also two interdisciplinary M.S. programs, an M.M. in music, and an M.A. designed specifically for teachers in physics, sociology, history, or mathematics. In the Health Sciences Center, the M.D. degree is offered by the Medical School and M.S. degrees by the School of Social Welfare and the School of Allied Health Professions.

Brief information on graduate and post-baccalaureate professional programs in the Health Sciences Center can be obtained from the Health Sciences Center section in this *Bulletin* (see pg. 268), more detailed information can be found in the separate *Health Sciences Center Bulletin.*

Continuing Education Program

The Center for Continuing Education is one of Stony Brook's fastest growing units. Its growth reflects both public interest and the University's commitment to education as a lifelong concern. The center makes the resources of the University available to those who can not study full-time. It offers a masters degree in liberal studies—an interdisciplinary, non-thesis, 30-unit degree. A bachelors degree is generally required for admission to the degree program, which is pursued largely by working professionals.

Summer Session

The Summer Session at Stony Brook covers a six-week period usually starting in late June. Graduate and undergraduate courses are offered in arts and sciences and in engineering. Graduate courses are also offered through the Center for Continuing Education.

Students in good standing at Stony Brook and other institutions are eligible. Qualified high school students who have completed their junior year may also enroll in some summer courses.

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.

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 200-400 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 undergraduates 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. Each residential quadrangle has its own dining hall. 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 will be granted to commuting students living with a parent or guardian. Off-Campus Housing Service is available to assist students in finding off-campus facilities.

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 health services to the entire campus community on a 24 hour a day, 7 days a week basis. Additionally, students may receive general medical and specialized services on an appointment basis. Mental health services are also provided. Dental care is not currently available. Many independent study and service groups come under the aegis of the University Health Service.

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 staff of the *International Student Office* is available to assist students 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 sub-station, 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 AM-4:00 PM and Friday and Saturday nights from 9:00 PM-1:30 AM. 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 XV-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

Prominent persons in government, education, and the arts and sciences visit Stony Brook regularly for lectures and seminars. During one representative period of several months, campus appearances were arranged for presidential environmental advisor Russel E. Train, N.S.F. Director William McElroy, Berlin Komische Opera Director Walter Felsenstein, consumer advocate Ralph Nader, Russian poet Andrei Voznesensky, advocate of women's rights Robin Morgan, comedian and social activist Dick Gregory, poet Allen Ginsberg, and cartoonist-writer Jules Feiffer. 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 *After the Rain* by John Bowen, a touring production of *Waiting for Godot,* Moliere's *Tartuffe, The Lady is Not for Burning* by Christopher Fry, and Ionesco's *Jack or the Submission.*

The Student Activities Board sponsors a series of programs, which have recently included performances by Mothers of Invention, New Riders of the Purple Sage, The Byrds, Hot Tuna, Allman Brothers, Youngbloods, Beach Boys, 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.

Athletics

Athletic clubs offer opportunities to learn about karate, skiing, judo, gymnastics, water polo, squash, and other activities. Intramural sports programs include league play in basketball, soccer, softball, and touch football as well as shorter duration competition in badminton, bowling,

cross country, foul shooting, golf, handball, paddle ball, squash, swimming, table tennis, tennis, volleyball, and wrestling.

Men's varsity teams are fielded in 11 sports: baseball, basketball, bowling, crew, cross country, judo, soccer, squash, swimming, tennis, and track and field. Student-run intercollegiate club teams compete in football, hockey, and karate. Women's intercollegiate teams are fielded in basketball, field hockey, gymnastics, softball, synchronized swimming, and tennis.

Stony Brook competes in the Metropolitan Intercollegiate Soccer Conference, Eastern Collegiate Athletic Conference, Knickerbocker Basketball Conference, Metropolitan Squash Association, National Intercollegiate Squash Association, and the Metropolitan Collegiate Swimming Conference.

The Stony Brook Riding Club is the current champion of the Intercollegiate Horseshow Association.

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 College of Arts and Sciences 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, 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

—for the Admissions Committee. Counselor, teacher, and student recommendations are employed to add depth and dimension to statistical data. Additional information which might help to interpret or clarify an application is welcomed by the Admissions Committee.

The information in this chapter 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 chapter 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 chapter 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.

Financial Aid and Economic Opportunity Program

Students who anticipate financial need and wish to apply to the University for financial assistance must file a Parents Confidential Statement (PCS) at the time of admissions application. PCS forms may be obtained from the secondary school Guidance Office, the Financial Aid Office of your college (if a transfer), or the Financial Aid Office at Stony Brook. The Parents Confidential Statement alone does not constitute application for aid at Stony Brook. Prospective students must contact the Financial Aid Office at Stony Brook and request an aid application form and the booklet "Financial Aid Programs for Undergraduate Students," which explains aid opportunities.

Applicants who are academically as well as economically disadvantaged according to federal and state eligibility guidelines may apply for the Advancement on Individual Merit (AIM) program. AIM, an Economic Opportunity Program (EOP), is a program designed to assist qualified poverty-level students meet the economic and academic requirements for success at the University. Applicants for AIM should contact their school guidance office or the University Admissions Office 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 are a New York State applicant; 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 form (D-1), a pamphlet entitled "How To Apply For Admission" giving complete application instructions, a card (D-2) for requesting the University to send

additional required application materials, and an envelope for mailing the D-1 application form. Each applicant should complete the D-2 card and mail directly to the Stony Brook Admissions Office at the time he receives the application packet. Upon receipt of the D-2 card by the Admissions Office, an additional form, the Supplementary Questionnaire (SQ) with full instructions will be sent to each applicant.

Applicants are strongly urged to file a completed application during the fall and the D-1 must be received in the Admissions Processing Center (APC) in Albany no later than January 15, 1973.

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 assure that the completed application form (D-1) arrives at the Admissions Processing Center, Albany, by January 15. It is also the student's responsibility to assure that all required supplemental materials are received at the Stony Brook Admissions Office by January 15. The University reserves the right to close application consideration at any time after January 15.

Applications for admission in the spring semester must be filed by November 1. Availability of on-campus housing is sometimes uncertain for mid-year entrants. Those students for whom campus housing is a determining factor should contact the Admissions Office before filing an application.

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 must be taken in sufficient time to assure that the scores are received by Stony Brook no later than January 15.

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 applicant's academic record has been filed in the Admissions Office. Group discussions led by trained undergraduate students also are utilized, and have been as effective and well received as individual interviews. In addition, student group leaders meet regularly with parents of applicants to discuss mutual concerns. Information regarding group 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

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 November 1. 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 be reviewed as a group. Applications received after March 1 will be reviewed on a rolling basis should any space still be available.

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 the 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.

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 blanket credit for the completion of the freshman and sophomore years (60 semester hours) including all general university requirements. In addition, credits earned in excess of 60 will be evaluated 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.

Transfer credit will be considered for all academic work satisfactorily completed (passing grade) at each prior institution. Award of either transfer credit from a non-accredited institution or credit earned more than 15 years ago will be deferred until the student has completed a satisfactory year of full-time study at Stony Brook.

Students will be classified according to the following schedule of semester hours accepted for credit: freshman, 0-23; sophomore, 24-54; junior, 55-84; senior, 85 or more.

At the time admission is offered, course evaluation forms will be sent to the student to be completed for each course within his 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 with applicability to major requirements.

Applicants interested in teacher preparatory programs are urged to contact the Admissions Office prior to filing an application to determine the availability of such programs.

Transfer students should take special notice that admission to Stony Brook at this time cannot include assurance of admission to the Teacher Preparation Program.

Transfer applicants who are seeking admission to one of the undergraduate programs in the Health Sciences Center should refer to the Health Sciences Center chapter in this *Bulletin* and to information in the separate *Health Sciences Center Bulletin* for information on eligibility and on the appropriate procedure for filing an application.

Handicapped Students

The academic admissions 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 Service (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 the time to work out solutions.

Notification of Admission

It is expected that 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 at a level commensurate with the work upon which acceptance was

based. 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. Requirements for the certification of registration, including a medical report and payment of necessary deposits are sent with 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), he is advised to contact an admissions counselor as soon as possible.

Deferred Enrollment

Consistent with the policy that permits admission of students who acquire academic and intellectual excellence outside the formal classroom experience, the University recognizes the desirability of permitting a limited number of admitted freshmen to defer enrollment for one year. It is expected that students granted deferred enrollment will use the opportunity to travel, to work, to perform service or otherwise enrich their life experience through activities exclusive of formal academic endeavor within the United States. The student granted deferred enrollment who subsequently presents a transcript for transfer of credits earned at an institution within the United States during the year of his absence voids the University's responsibility to reserve a place for him at the time of his return. His status also changes to a transfer student who would then have to file a new application 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. It is the student's responsibility to return to the University the September following completion of the year of deferred enrollment; failure to do so voids the University's obligation to insure a place in the class entering 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 will normally be mailed with the offer of admission. Applications must be received in the Admissions Office by May 1. The Admissions Office will render decisions by June 1 to all who have 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. Each department determines the minimum test score which is required for advanced placement or for the granting of semester hour credit. 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 has the authority to determine the courses which 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 offered an additional $50 deposit. These deposits, payable upon tentative or conditional acceptance, 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. At all other times offers of admission are valid for 30 days from the date admission is offered.

Special Undergraduate Students

A limited number of students may enroll each semester as part-time, non-matriculated undergraduates (special students). 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 must take less than twelve credits of work. There is no separate undergradu-

ate evening or part-time division; special students choose from among regularly scheduled classes. Registration priority is given to matriculated students.

Although special students are non-matriculated (not degree candidates), courses and grades may be applied to a degree program at Stony Brook should permission to matriculate eventually be granted. A transcript may also be secured from the Registrar if a special student subsequently applies to another college and wishes to petition that college for transfer credit for courses satisfactorily completed at Stony Brook. A special student who wishes to apply for matriculation may secure the appropriate forms from the Admissions Office. Attendance as a special student does not accrue special consideration for admission subsequently as a matriculated student.

Matriculated students who wish to change to special status for a semester may apply for a leave of absence from matriculation, complete a special student application, and arrange for an interview with either a guidance or admissions counselor. Stony Brook students who wish to complete degree requirements as specials 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.

Summer Orientation for Freshmen

Orientation for the freshman year is conducted during June and July. Orientation involves academic advisement, registration, and help in adapting to university life. Attendance is strongly recommended. Students unable to attend the Summer Orientation Program will be registered just before classes begin in September.

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 page 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. 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—freshman and sophomore	$ 325.00	$ 325.00	$ 650.00
N.Y. State resident—junior and senior	400.00	400.00	800.00
Non-resident—freshman and sophomore	537.50	537.50	1075.00
Non-resident—junior and senior	650.00	650.00	1300.00
Graduates:			
N.Y. State resident	600.00	600.00	1200.00
Non-resident	750.00	750.00	1500.00
Professionals (medicine, dental medicine):			
N.Y. State resident	800.00	800.00	1600.00
Non-resident	1000.00	1000.00	2000.00

	FIRST SEMESTER	SECOND SEMESTER	YEAR
Part-time Undergraduates:			
(Charge per semester credit hour)			
N.Y. State resident—freshman and sophomore	$ 21.50	$ 21.50	
N.Y. State resident—junior and senior	26.75	26.75	
Non-resident—freshman and sophomore	35.75	35.75	
Non-resident—junior and senior	43.50	43.50	
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 University Deposit*			
Commuting Student	25.00		
Resident Student	50.00		
[c] *Orientation* (Freshmen only)	30.00		

[a] This fee is set by student 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.

	FIRST SEMESTER	SECOND SEMESTER	YEAR
[d] *Graduation Fee*	$ 15.00		
Late Registration Fee	20.00		
Advance Tuition Deposit (Freshmen and transfers only)	50.00		
Advance Housing Deposit (Freshmen and transfers only)	50.00		
Room (Includes basic telephone rental charge) Double Occupancy	332.50	$332.50	$665.00

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.

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 $20.00.

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.

Refund Schedule

Request for refund of tuition or room must be made in writing to the Bursar's Office, Room 262, Administration Building.

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 138, Stony Brook Union Building.

College fee is non-refundable.

A student or special student who is given permission to cancel his 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.

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

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 his intent to cancel registration on or before the *second Saturday* following the first day of classes shall be deemed to have cancelled his 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 that 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 $50 deposit. These deposits, payable upon tentative or conditional acceptance, 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. At all other times offers of admission are valid for 30 days from the date admission is offered.

1973 Summer Session

Expenses for the 1973 Summer Session are as follows:

Tuition

Undergraduates (N.Y. State Resident) Fresh. & soph.	$21.50 per cr. hr.
Undergraduates (N.Y. State Resident) Juniors & seniors	26.75 per cr. hr.
Undergraduates (Out-of-State Resident) Fresh. & soph.	35.75 per cr. hr.
Undergraduates (Out-of-State Resident) Juniors & seniors	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 students
** Student Service Fee	5.00

Rooms

Summer Double Occupancy (six-week session) Rate per person	$72.00

Financial Aids

The Financial Aid Office provides information on programs available to all students and assists students whose summer earnings and family resources are inadequate to meet college expenses completely. Listed

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* 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.

below, in general terms, are a number of financial aid possibilities. Often a "package" of aid can be created through consultation between the student and the financial aid officer which will employ one or more of these programs to meet one's individual needs.

Students who anticipate the need for financial aid should write to the Financial Aid Office for applications and further information. The office provides a booklet, "Financial Aid Programs For Undergraduate Students," which describes all programs, eligibility criteria, and application procedures in greater detail. Stony Brook does not have an early decision plan. Applications will be available in the early spring for currently enrolled Stony Brook students and should be submitted prior to the end of February. For new students, applications will be available in the late spring and should be submitted prior to the end of May.

Health Sciences Center students and applicants should consult the *Health Sciences Center Bulletin* for information about sources of financial assistance for which students in the various health programs are eligible and for information about the application procedure.

Regents College Scholarship and Scholar Incentive Awards

These awards are sponsored by the State of New York for state residents only. Eligibility is determined on the basis of the Regents Scholarship Examination, given to high school seniors and administered by the schools. Persons achieving top scores on the examination receive Regents Scholarships. The Scholar Incentive Awards however are based strictly on New York State taxable income from the preceding year. No test score is necessary for this award. Regents Scholarships theoretically range from $250 to $1000, but in fact will not exceed the tuition charge at the college attended. Scholar Incentive Awards range from no payment to full tuition coverage, depending on the net taxable income of the applicant's family. Applications must be obtained directly from the State Education Department, Regents Examination and Scholarship Center, 99 Washington Avenue, Albany, New York 12210.

State University Scholarship

Due to certain technicalities in the Scholar Incentive program mentioned above, many needy students do not receive full benefits of the award. Therefore, the State University of New York has established a program to supplement Scholar Incentive Awards. For students whose combined family taxable income is less than $2000 per year, the State University Scholarship makes up the difference between Scholar Incentive Award and tuition charges. Contrary to what the name implies, SUS is based strictly on need, not on academic performance. Applications and further information may be obtained from the Financial Aid Office at the University.

Educational Opportunity Grants

The Educational Opportunity Grant program was established by the federal government in 1965 to provide assistance for students "of exceptional financial need." Under this program, administered by the local colleges, awards of $200 to $1000 per school year are made in conjunction with a "package" of financial aid (scholarship, scholar incentive, loan, part-time work) which is tailored to the individual student's needs and capabilities. Applications are available at the Financial Aid Office.

National Defense Student Loans

Under this, another federal program administered by individual colleges, a needy student may borrow up to $1000 during each year of undergraduate study and $2500 per year during graduate years. No interest accumulates and repayment of a loan does not begin until nine months after graduation. From that time the student has up to ten years to repay at 3% interest per year. Payment may be deferred during service in the Armed Forces or Peace Corps. For persons entering the field of education, cancellation of the loan obligation is possible at the rate of 10% per year for a maximum of five years. Teachers of the underprivileged may obtain cancellation at the rate of 15% per year. Thus a person may cancel 50% or more of his total loan liability by teaching.

NYHEAC/Federal Guaranteed Loan Program

This program permits a student to borrow money from his local bank to meet college expenses. The government will pay the interest on a loan until the student graduates, at which time he must repay his obligation to the bank at 7% interest. The word "guaranteed" means that in the event of death or disability of the borrower, his obligation is paid in full by the government.

Terms of repayment are essentially the same as the National Defense Student Loan program above, with the exception of the teacher cancellation provision. Applications may be obtained from local banks or from the Financial Aid Office at the University.

College Work-Study Program

These possibilities are mentioned last because the University recommends that, if possible, the student not work during his first year of college. It is generally a good idea to become accustomed to the academic and social pressures of college life without the additional burden of a job. In future years, however, depending on his capabilities, a student may wish to meet part of his expenses or reduce his loan obligation by taking a part-time job. The University has a limited number of positions available as part-time secretaries, laboratory assistants, cafeteria workers, etc. This area has been broadened considerably by the College Work-Study Program. Under this program the federal government pays a portion of the salaries of students having demonstrated financial need.

They may be employed up to 15 hours per week in on-campus jobs or off-campus community service projects. Provision can also be made for students to work full-time during vacation and summer periods. These positions are intended to be educationally meaningful. Often, but not always, a student can obtain a position close to his major field of interest.

Other State and Federal Aids

Scholarships for children of deceased or disabled veterans are granted by New York State on the basis of an annual scholarship examination. Application should be made through the local high school principal or to the State Education Department, 800 North Pearl Street, Albany, New York 12204. Eligible students may also receive financial assistance from the Division of Vocational Rehabilitation of the New York State Education Department.

Students whose parents receive Social Security benefits should be aware that payments for dependent children may be extended from age 18 to age 22 if the child is a full-time student and remains unmarried.

Veterans may receive assistance under the provisions of Public Law 894 (disability), 550 (Korean War) or 89-358, the cold war GI Bill, which provides payments of $175 per month to single veterans who are in full-time study. Veterans with one dependent may receive $205 per month. Further information may be obtained from local Veterans Administration offices.

When approved by the business officer of the University, scholarships held by State University students may be applied directly to such expenses as tuition, room, board, and fees. In the case of Regents or university-administered financial aids, deferred payment can often be arranged, but only when an award has been approved and cash or check is pending. Students are advised to have their notices of award from all programs with them when registering at the University.

Private Scholarship Programs

As Stony Brook becomes established and its reputation grows, an increasing number of scholarships are expected to become available through the generosity of private donors or foundations. Several are listed below:

A. *The Kaltenborn Foundation* offers three $1000 scholarships annually, one each to outstanding juniors in the fields of music, art, and theatre. These scholarships are awarded without regard to school expenses or financial need and are intended to provide the student with additional resources for pursuit of his or her field of interest. Additional information is available through the Departments of Music, Art, and Theatre Arts.

B. *Republic Aviation Scholarships,* as a result of a grant by the Republic Assistance Fund, Inc., will be awarded, in the amount of $400 each, to six Stony Brook students during the 1972-73 academic year. First consideration for these awards will be given to students who are children of former employees of Republic Aviation Corporation, regardless of present place of residence. Students residing in Nassau and Suffolk Counties will be eligible for consideration if no child of a former Republic employee applies and qualifies in any academic year. Other factors in determination of the award winners will be academic performance in secondary school, participation in extracurricular activities, evidence of leadership potential, and relative financial need. Scholarship winners' progress will be reviewed annually and the award may continue during succeeding undergraduate years. Applications for the Republic Aviation Scholarships will be available from the Financial Aid Office at the University.

C. *Ashley L. Schiff Memorial Alumni Scholarship* was established in memory of Associate Professor Ashley Schiff of the political science department by the Stony Brook Alumni Association. The cash award is given annually to an outstanding freshman.

D. *Class of 1970 Scholarship* is awarded annually to the student making the most outstanding contribution to the University during his or her freshman year.

E. Two *Women's Club Scholarships* of $250 each are given to an outstanding junior woman and man for excellence in scholarship and service to the University.

F. *Morris Morgenstern Foundation Student Loan Funds* are available to sophomores, juniors, and seniors on an interest free basis. These loans are intended to serve students as emergency funds on a short term basis. The loans, which ordinarily will not exceed $125.00 in amount, will be granted for a 60 day period, but in no event longer than the end of the academic year. The loans will be allocated through the Financial Aid 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 $20. Registration is not permitted after the end of the second week of classes. *A student is not considered registered until the appropriate forms have been filed with the Office of Records and payment or proof of proper deferment of tuition and fees has been made 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 approval of an academic advisor each student selects his program of courses, and it is his responsibility that the program conforms

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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.

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 of the second week. After that date, a course may be added only with the approval of the Committee on Academic Standing (See page 48 "Committee on Academic Standing").

From the third through the ninth week, a course may, within the regulations, be dropped (See page 44 "Course Load" and page 45 "Grading System"). After the ninth week, a student may withdraw from a course only as a result of his withdrawal 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 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 his sophomore year, each student is expected to select an academic major in order to plan his program more effectively with an academic advisor in the department or program of his major. The academic advisor is usually assigned for the last two years of university work.

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.

Change of Major or Change to a Double Major

In order to change from one academic major to another, a student must obtain a Change-of-Major card from the Office of Records. He must then obtain the approval of his present advisor, the chairman of the department of his present major, and the chairman of the department in which he wishes his new major. The card is then returned to the Office of Records where the 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 he 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 tenth 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 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 only after the completion of two semesters

At his discretion, an instructor or supervisor may assign the following temporary mark: I (Incomplete) which indicates inability to complete all course requirements due to 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 term 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.

Pass/No Credit Academic Record Option

With the possible exception of courses in his major program, a student may elect to have the final grade in any course recorded on his official academic record either as P (Pass) if his reported grade is A, B, C, or D or as NC (No Credit) if his 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 advisor 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.

Repeating Courses

A student may register again in a course for which he has 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.).

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 his academic program and progress to his parents. Accordingly, grade reports are mailed directly to the student's local address at the end of the fall semester and to his home address at the end of the spring semester and the summer session as soon as possible after the end of the final examination period.

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 preced-

ing 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.

Special students and other undergraduate non-matriculating 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 committee policies and advice about individual requests to the committee may be obtained from the Undergraduate Studies Office or the Guidance Services 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 must have been registered as a full-time student at the University for the two semesters immediately preceding his graduation.

Graduation with Honors

A candidate for the bachelors degree who maintains a high level of scholarship (3.25) throughout his course of study is graduated with the honors designation, *cum laude;* if a student attains a higher scholastic

average of 3.50, he is graduated *magna cum laude;* and if he attains the highest average in scholarship of 3.75 or higher, he is graduated *summa cum laude.* Such honors are indicated on the student's diploma and on his permanent academic record.

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 his 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.

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 his plans in advance with both his academic advisor and the Stony Brook Admissions Office where he can obtain assistance in filling out a form listing his 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 academic advisor or department chairman and an official statement from the Office of Records that he is in good academic standing; the student must also accept full responsibility for tuition fees and any similar charges in effect at the school he chooses. 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 Israel.

In addition to the SUNY-sponsored programs, individual academic programs may be designed independently by the student to fit his 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 should discuss his plans with his academic advisor or department chairman to make sure that his 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 only 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.

A student who submits his withdrawal form 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 the 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 have been dismissed and who 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, mathematical sciences, and physics ..... 6-8 credits

Note: Not acceptable to satisfy the natural sciences and mathematics requirement are the following courses in mathematical sciences: MSM 101, 102.

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

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

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. Music: performance or studio courses MUS 114, 115, 116, 151 and the first two semesters of MUS 161-199 and MUS 261-299.
3. English courses in composition EGL 101, 102, 105; and theatre arts courses in diction: THR 130, 133.
4. Foreign language courses below the intermediate, i.e., second year, level.

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.

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.

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.

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

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 advisor or a member of the department.

II. The Interdisciplinary or Interdepartmental Major

This choice of degree program allows the student to investigate an area of concern which transcends the limits of individual academic departments by combining appropriate courses from two or more disciplines to create an integrated core of study directed toward a special goal. As of September 1972, 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 designed to lead to the baccalaureate degree by means of a plan of study developed by the student to meet individual interests. Advisors in the Undergraduate Studies Office will help the student in planning a program. The sole requirement of this program, after the general university requirements have been met, is that 60 course credits of work in courses beyond the introductory level must be completed. Of these, 45 credits must be in courses from the College of Arts and Sciences. At least 36 major credits must be taken for letter grade. For further information consult the Undergraduate Studies Office.

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 the 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 121 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 Office of Teacher Preparation for assistance as early as the second semester of the freshman year.

DEPARTMENT OF ANTHROPOLOGY

Professors: P. BROWN *(Chairman),* CARRASCO *(Director of Graduate Studies),* FARON

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

Assistant Professors: ARENS, R. GARDNER, HICKS, NEWTON *(Museum Curator),* REGELSON, J. STARR, WEIGAND, WHEELER

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 150 Elementary Social Structures or ANT 200 Foundations of Social Anthropology.
   *3. Two ethnographic area courses, such as Peoples of Africa, Peoples of South America, North American Indians, etc.: courses numbered 201-219.
   *4. Two topical courses, such as Comparative Religious Systems, Political and Legal Anthropology, Social and Cultural Change, etc.: courses numbered 250-280.
   5. One 300-level course.
   6. Three elective credits to be taken from categories 3, 4, or 5 above.

B. A selection of six additional credits, either among listed departmental course alternatives or appropriate courses in other departments with the approval of advisor. 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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* Consult advisor if in doubt about the difference between ethnographic area and topical courses.

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

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

ANT 200 Foundations of Social Anthropology

An examination of the development of theory in social anthropology. Various theoretical approaches will be applied to analyses of ethnographic data and topics of concern to social anthropology. The aim will be to provide anthropology majors with a broad and sophisticated preparation for advanced courses in the department.
Prerequisite: ANT 102.
Fall and Spring, 3 credits

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

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

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

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

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

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

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

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. Not offered 1972-73.

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. Not offered 1972-73.

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

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

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

ANT 250 Economic Anthropology

Economic life of primitive peoples and precapitalistic civilizations with emphasis on the integration of the economy with technology and with social and political institutions.
Prerequisite: ANT 102.
Fall, 3 credits

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, 3 credits

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 1972-73.

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

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

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

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

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. Not offered 1972-73.

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

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

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. Not offered 1972-73.

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

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.
Prerequisites: ANT 102 and 150 or 200.
3 credits

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

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

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.
Prerequisite: ANT 150 or 200.
Fall, 3 credits

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

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

ANT 301 Development of Anthropological Theory and Method

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

Prerequisites: ANT 150 or 200 and advanced standing or permission of instructor.
Fall, 3 credits

ANT 303 Evolution of the State

The theories of a number of seminal thinkers in social history, political theory, economics, sociology, and anthropology are tested against the empirical results of contemporary anthropological research, both archaeological and ethnographic. Emphasis is upon Asia and Africa but New World materials are also introduced for purposes of comparison.
Prerequisites: ANT 150 or 200 and advanced standing or permission of instructor.
Fall, 3 credits

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 his material in a seminar, and writes a paper on his research.
Prerequisites: ANT 150 or 200 and advanced standing or permission of instructor.
Spring, 3 credits

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 150 or 200, ANT 204, and advanced standing or permission of instructor.
Spring, 3 credits

ANT 308 Seminar in Latin American Cultures

Research and discussion about selected topics in the culture and social structure of Indian and peasant communities in Latin America.
Prerequisites: ANT 150 or 200 and advanced standing or permission of instructor.
Fall, 3 credits

ANT 310 Readings in Anthropology

Individual advanced readings and research on selected topics in anthropology. Work may be submitted for honors in anthropology.
Prerequisites: ANT 150 or 200 and senior standing and permission of department.
Fall and Spring, 1 to 4 credits

ANT 312 Patterns of Empire

A comparative analysis of the social institutions of the early empires will be offered. The evolution of militarism, secular bureaucracies, long-distance trade, land use and tenure, and other topics will be examined. Problems involved in the use of early documents and/or archaeological materials will be discussed.
Prerequisites: ANT 150 or 200 and advanced standing or permission of instructor.
Spring, 3 credits

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

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.
Prerequisites: ANT 150 or 200 and advanced standing or permission of instructor.
Fall and Spring, 3 credits each semester

DEPARTMENT OF ART

Professors: ALLOWAY, CASTEDO
Associate Professors: BOIME, COUNTEY, GUILMAIN *(Chairman)*, KLEEGE, KORAS, MALLORY, MORLEY, WHITE
Assistant Professor: LUSKER
Instructor: BERMAN
Lecturers: BARNITZ, INKE, LINDGREN
Adjunct Instructors: LEFKOWITZ, TING
Adjunct Lecturer: 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 the student great freedom in choosing his courses, enabling him to move in the direction in which he is most interested.

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 advisor, ART 201, *or* ART 203, *or* ART 204.	3
2. ART 102, or with permission of the departmental advisor, ART 205, *or* ART 207, *or* ART 209, *or* ART 210, *or* ART 212.	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 advisor, 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 the faculty of the department to act as sponsor. The student, with the approval of the sponsor, must submit a proposal of his 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 his honors advisor. In the practice of art area, the student will be expected to prepare a small one-man show or similar project (i.e., one large, more ambitious work) in lieu of a thesis, under the supervision of his honors advisor.

The student's project will be judged by a jury composed of at least two members of the Art Department and a faculty member from another department, recommended to the vice president for liberal studies 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 instructor.

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

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

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

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

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

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

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

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

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

ART 201 Ancient Art

The history of art in the ancient Mediterranean world from the geometric period to the Constantinian period.
Prerequisite: ART 101.
Fall, 3 credits

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

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

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

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. Mannerism in central and northern Italy.
Prerequisite: ART 101 or 102.
Fall, 3 credits

ART 209 Northern Renaissance Art

Painting in Flanders and Germany in the 15th and 16th centuries.
Prerequisite: ART 101 or 102.
Fall, 3 credits

ART 210 Northern Baroque Art

Painting, sculpture, and architecture 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

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 Velasquez.
Prerequisite: ART 102.
Spring, 3 credits

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

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 the Creole or *mestizo* expressions.
Prerequisite: ART 101 or 102.
Fall, 3 credits

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

ART 217 Pre-Columbian Art

A survey of the artistic forms of pre-Columbian civilizations from archaeological *Olmecs* to the architecture of *Machu Picchu.*
Prerequisite: ART 215.
Fall, 3 credits

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

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

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

ART 241 19th Century Art

European art of the 19th century.
Prerequisite: ART 102.
Fall and Spring, 3 credits

ART 243 20th Century Art

European and American art of the 20th century.
Prerequisite: ART 102.
Fall and Spring, 3 credits

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

ART 251 Major Artists

A single major artist or architect will be selected. His development, his works, and his 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

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

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

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

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

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

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

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

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

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.
Fall and Spring, 3 credits

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

ART 338 Senior Seminar in Problems of Art History

Introduction to research methods in art history and theory. Senior art majors will work on individual research projects under the supervision of the instructor.
Prerequisites: Art major with senior standing and approval of department.
Spring, 3 credits

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

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

INTERDISCIPLINARY PROGRAM 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

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 Philippines); 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 advisors.

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 363 Nationalism in Southeast Asia
   HIS 364 Problems in the Modern History of Southeast Asia
   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 261 Intellectual History of China
   HIS 262 Contemporary China
   HIS 362 Topics in the History of Chinese Communism
   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 304 Modern Japanese Philosophy and Literature
   ** ECO 284 Topics in Area Studies

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* Suggested as an introductory course.

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

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 Topics in the Expansion of Europe
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 305 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

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, problems of modernization, industrialization, historical continuity and discontinuity, and comparative aesthetics. A single topic will be discussed each semester which could be repeated the next semester. A seminar director will be responsible for the selection of the topic and the faculty participants. Fall and Spring, 3 credits.

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.

* Suggested as an introductory course.
** Course content varies according to the interest of the instructor.

DIVISION OF BIOLOGICAL SCIENCES

Provost: R. JONES

Department of Biochemistry

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

Associate Professors: FREUNDLICH, INOUYE, MOOS, [a]RILEY, STUDIER *(Adjunct)*

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

Department of Cellular and Comparative Biology

Distinguished Professor: GLASS

Professors: E. CARLSON, ERK

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

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

Lecturer: M. BAYLOR

Department of Ecology and Evolution

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

Associate Professors: HECHTEL, ROHLF, SMOLKER, TURNER

Assistant Professors: J. FARRIS, FUTUYMA, KOEHN

Faculty Holding Joint Appointments in Division of Biological Sciences:

Professors: E. BAYLOR, CAIRNS, MCHUGH, SQUIRES, G. WILLIAMS, WOODHEAD

Associate Professor: WURSTER

Assistant Professor: V. FARRIS

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.

[a] On leave academic year 1972-73.

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. The program is based on a three semester core in the biological sciences and pertinent courses in mathematics, chemistry, and physics.

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 150 Biology of Organisms
   BIO 151 Cell Biology and Chemistry
   BIO 162 Cell Biology and Biochemistry Laboratory
   BIO 361 Biochemistry

   At least six additional credits must be chosen by the student, in consultation with his advisor, from among the following courses:

   BIO 298, 299, 313, 320, 362, 363, 364 (described in this *Bulletin*) or BIO 505, 506, 508, 513, 514, 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 205, 206 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 205, 206.)

B. Courses in related fields

   MSM 121, 122, 151 Calculus I, II, III
   MSA 104 Introduction to Probability
   PHY 101, 102, 151 General Physics I, II, III

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

Honors Program in Biochemistry

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

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

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

Requirements for the Biological Sciences Major

In addition to the general university requirements for the Bachelor of Science degree, the following courses are required for the major in biological sciences:

A. Study within the area of the major

BIO 150 Biology of Organisms
BIO 151 Cell Biology and Biochemistry
BIO 152 Adaptation and Evolution

(Note: These courses should be completed as soon as possible, preferably BIO 150 in the freshman year and BIO 151, 152 in the sophomore year.)

At least 16 additional credits in biology or related areas must be chosen by the student in consultation with his advisor. Of these credits, at least 12 must be taken within the division of biological sciences and must include at least two different biology courses with laboratory or biology laboratory courses. No more than five credits toward the total of 16 elective credits will be granted for biology courses below the 200 level.

(Note: BIO 101, 102, 103, 104, 107, and 111 are designed for nonmajors and cannot be used to satisfy the above requirements.)

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 205 or 203 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 101 Introduction to Finite Mathematical Structures I

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 advisors 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 advisor'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.

COURSES IN THE BIOLOGICAL SCIENCES

BIO 101, 102 Biology: a Humanities Approach

The major concepts of biology are presented from historical, contemporary, and critical viewpoints. These concepts include the cell, the gene, molecular biology, development, and evolution. The human implications or values associated with each concept are emphasized. Three hours of lecture each week. Primarily intended for non-biology majors.
Fall and Spring, 3 credits each semester

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, population, and religion.
Prerequisite: BIO 101.
Fall, 2 credits. Not offered 1972-73.

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

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 150 or 171.
Fall, 2 credits

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

BIO 150 Core I: Biology of Organisms

An introduction to the diversity of plants and animals, their genetics, interrelationships, ecological distributions, and evolution.
Spring, 3 credits

BIO 151 Core II: Cell Biology and Chemistry

The cell is studied as the unit of structure, biochemical activity, genetic control, and differentiation. The principles of biochemistry and genetics are applied to an understanding of nutrition, growth, and development.
Prerequisite: CHE 102.
Corequisite: CHE 201.
Fall, 3 credits

BIO 152 Core III: Adaptation and Evolution

Studies of adaptation in organisms, including physiological, behavioral, ecological, and evolutionary aspects. Comparative studies on organ physiology of plants and animals lead to discussions of behavior, community ecology, population ecology, and evolutionary mechanisms.
Prerequisite: BIO 151.
Prerequisite or corequisite: BIO 150.
Spring, 3 credits

BIO 155 General Ecology

Designed to provide a sense of the problems of modern ecology. Population growth and regulation, interspecific interactions in natural communities, and the concept of

the balance of nature will be analyzed. The mutual relation between human activities and ecology will be discussed. Mathematics is not a prerequisite but might prove helpful. Three hours of lectures per week. Open to majors and non-majors.
Fall, 3 credits

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 1972-73.

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 151.
Fall, 2 credits

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 151.
Spring, 2 credits

BIO 171 General Zoology

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.
Fall, 3 credits

BIO 172 General Botany

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.
Spring, 3 credits

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 152.
Prerequisite or corequisite: PHY 131 or PHY 101.
Fall, 3 credits

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

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 world-wide health problems is considered. Living materials are emphasized. Three hours of lecture or discussion and one three-hour laboratory per week.
Prerequisite: BIO 151 or permission of instructor.
Fall, 4 credits

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 150 or 171 or permission of instructor.
Fall, 3 credits

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

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 his project. The course may be taken more than two semesters, but no more than eight credits may be utilized for divisional major requirements.
Prerequisite: BIO 152 or permission of instructor. Permission must be verified by filing card in office.
Fall and Spring, 2 to 4 credits each semester

BIO 300 Materials and Methods in Teaching Biology

This course, designed for prospective secondary school teachers of biology, emphasizes methods and materials appropriate to the teaching of an experimental science at that level. Two hours of lectures or discussion and one three-hour laboratory per week. Not applicable for major credit in biological sciences.
Prerequisite: Attainment of senior status as biology major or permission of instructor.
Fall and Spring, 3 credits

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

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 150 or 171 or permission of instructor.
Fall, 4 credits

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 per week.
Prerequisite: BIO 150 or 171 or permission of instructor.
Spring, 4 credits

BIO 305 Statistics for Biologists

An introductory statistics course for students in all areas of biology. Normal statistics to analysis of variance, regression analyses, and transformations. 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

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.
Summer, 4 credits

BIO 310 Developmental Genetics

The genetic analysis of developmental events in higher organisms. Two hours of lectures and discussion per week.
Prerequisite: BIO 151.
Spring, 2 credits

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 152 and completion of divisional mathematics requirements.
Spring, 3 credits

BIO 313 Molecular Genetics

The molecular bases of recombination, 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 150, 151.
Fall, 3 credits

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

BIO 321 Microbiology

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 150, 151 and CHE 202 or 212 or permission of instructor.
Spring, 3 credits

BIO 323 Microbiology Laboratory

A laboratory designed to acquaint the student with the techniques of culturing and experimenting with algae, protozoa, fungi, and bacteria. Two three-hour laboratories per week.
Prerequisite or corequisite: BIO 321 or permission of instructor.
Fall, 2 credits

BIO 330 Ornithology

An advanced natural history of the birds, designed to provide a sufficiently detailed base for understanding currently active areas of research. Two hours of lectures or discussions per week.
Prerequisite: BIO 304.
Spring, 2 credits

BIO 331 Oceanography for Biologists

Introduction to physical and chemical aspects of the marine environment.
Prerequisite: BIO 303 or 304.
Corequisite: Designed to accompany BIO 334 or 338.
Spring, 1 credit

BIO 332 Field Ornithology

A series of half- and full-day field trips to provide experience with field techniques for estimating distribution, movement, abundance of populations and aspects of breeding and social behavior.
Prerequisite or corequisite: BIO 330.
Spring, 2 credits

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 1972-73.

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

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

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

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 152 and CHE 201.
Spring, 4 credits. Not offered 1972-73.

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 362 Physical Biochemistry

A preview of the physical techniques and concepts involved in the study of biological molecules, particularly macromolecules. Much of the course will be devoted to the three dimensional structure of proteins and nucleic acids.
Prerequisites: BIO 361, and CHE 153, 154.
Spring, 3 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.
Prerequisite: BIO 361.
Spring, 3 credits

BIO 364 Molecular Biology of Viruses

This course covers the principal aspects of the replication of bacterial and animal viruses with emphasis on genetics and biochemistry. Curernt research problems in the field will be stressed.
Prerequisite: BIO 361.
Spring, 3 credits

BIO 371 The Species in Ecology and Evolution

This course will be devoted to examination of field and experimental evidence related to evolutionary and ecological theory, with particular emphasis placed on the speciation process and its ecological and zoogeographical consequences.
Prerequisite: BIO 386 or permission of instructor.
Fall, 3 credits

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

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 152.
Spring, 3 credits

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

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 152 and CHE 202; a basic knowledge of plant and animal physiology is highly recommended.
Spring, 3 credits

BIO 386 Ecology

An examination of the interactions of living organisms with their physical and biological environments. Special attention is given to population dynamics and the interactions among organisms that determine the structure, function, and evolutionary development of biological communities.
Prerequisites: BIO 152 and completion of divisional mathemathics requirement.
Spring, 3 credits

BIO 388 Ecology Laboratory

Investigation of the application of general ecological principles to specific populations and communities.
Prerequisite or corequisite: BIO 386.
Spring, 2 credits

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: Junior status as a biology major or permission of instructor.
Spring, 2 credits

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

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

Graduate Courses

Certain graduate courses are open to qualified advanced undergraduates. Consult the *Graduate Bulletin* for details about these courses.

INTERDISCIPLINARY PROGRAM IN BLACK STUDIES

Associate Professor: HOWIE

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

Lecturers: GANT, PARRIS

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:

At least ten semester courses chosen from the black studies curriculum, six units of which must constitute independent study. Total: 30 credits

Note: Majors must consult with their advisor in choosing courses to meet the above requirements or in selecting a second major or a minor.

Special Information on Courses

1. Appropriate choices to satisy 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.

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 Af-

rica, 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

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

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

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

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

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.
Spring, 3 credits

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 significance 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

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

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

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

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

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 with POL 240.
Prerequisite: Two previous courses in the social sciences or sophomore standing.
Fall and Spring, 3 credits

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 1972-73.

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

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

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 1972-73.

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

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

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

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

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

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

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

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

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

BLS 299 Readings in Black Studies

Prerequisite: Permission of department.
Variable 1 to 3 credits

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

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

BLS 399 Research in Black Studies

Prerequisite: Permission of department.
Variable 1 to 3 credits

DEPARTMENT OF CHEMISTRY

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

Associate Professors: GOLDFARB, SCHNEIDER, WEISER, WHITTEN, WISHNIA

Assistant Professors: M. W. CARLSON, F. FOWLER, D. HANSON, JESAITIS, P. JOHNSON, KERBER, KRANTZ, KWEI, LLOYD, MUROV, S. SCHWARTZ, SPRINGER, STIEFEL

Director of Chemical Laboratories and Lecturer: CROFT

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, premedical 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.

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.

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

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. They must also demonstrate a reading knowledge of German or Russian by taking two semesters of the one chosen, or by passing the appropriate graduate language examination given by the Department of Chemistry. The German requirement can also be met by taking one semester of GER 115 Reading German.

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 205 Organic Chemistry Laboratory
CHE 255 Introduction to Quantum Chemistry
CHE 206 Organic Chemistry Laboratory or CHE 257 Instrumental Methods of Physical Chemistry or CHE 258 Molecular Structure and Spectroscopy Laboratory
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 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; and 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 and Spring, 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 and Spring, 4 credits each semester

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 and Spring, 1 credit each semester

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 and Spring, 1 credit each semester

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

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, 3 credits

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.
Prerequisite: 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

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 Chemical Statics and Structure

The role of molecular structure in the development of chemical concepts. The electronic structure of atoms is described. Both geometric and electronic structures of molecules, and methods by which they can be determined, are discussed. The structures of aggregates of matter at various levels of refinement are considered. An introduction to chemical energetics is included. Prerequisites: One year of college chemistry and permission of instructor.
Fall, 3 credits

CHE 161 Chemical Dynamics

Kinetics and mechanism of chemical reactions. Experimental methods of determining rate laws and rate constants, and the microscopic basis of reaction attributes are discussed.
Prerequisites: One year of college chemistry and 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 205, 206 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 and Spring, 3 credits each semester

CHE 203, 204 Organic Chemistry Laboratory B

An introduction to the techniques of preparing and purifying organic compounds. The emphasis in the second semester is on the use of modern instrumentation as an aid to organic synthesis and qualitative organic analysis. Primarily for chemistry majors. Seven hours of laboratory and discussion per week.
Corequisites: CHE 201, 202 or 211, 212.
Prerequisite to CHE 204: CHE 203.
Fall and Spring, 2 credits each semester

CHE 205, 206 Organic Chemistry Laboratory A

Course material similar to CHE 203, 204. Primarily for non-chemistry majors. Four hours of laboratory and two hours of discussion biweekly.
Corequisites: CHE 201, 202 or 211, 212.
Prerequisite to CHE 206: CHE 205.
Fall and Spring, 1 credit each semester

CHE 211, 212 Organic Chemistry B

An intensive introductory course similar to CHE 201, 202. For students with a background of chemical kinetics and thermodynamics. It is recommended that CHE 203, 204 or CHE 205, 206 be taken concurrently with CHE 211, 212. Three lecture hours per week.
Prerequisite to CHE 211: CHE 153 or permission of instructor.
Prerequisite to CHE 212: CHE 211.
Fall and Spring, 3 credits each semester

CHE 230 Chemistry in Technology and the Environment

Use of chemical principles in understanding processes that occur in the modern technological world and in the natural environment. Certain ecological problems of a chemical nature are analyzed. Methods of controlling these problems are discussed. Two lecture hours per week.
Prerequisite: CHE 102 or 104.
Spring, 2 credits

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 241.
Fall, 3 credits

CHE 256 Statistical Thermodynamics and 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

CHE 257 Instrumental Methods of Physical Chemistry

Electronics, vacuum systems, optical instrumentation, properties of gases, electric and magnetic properties of matter. Six hours of laboratory and discussion per week.
Prerequisite: CHE 155.
Corequisites: CHE 201 or 211 and 255.
Fall, 2 credits

CHE 258 Molecular Structure and Spectroscopy Laboratory

Basic principles of optical, EPR and NMR spectra of molecules. Six hours of laboratory and discussion per week.
Prerequisites: CHE 155, 201 or 211, and 255.
Spring, 2 credits

CHE 262 The Logic of Thermodynamics

The empirical and logical basis of the laws of thermodynamics and their historical evolution are explored. The applicability of thermodynamic reasoning to problems in the "exact" and "inexact" sciences is considered. Some discussion of the connections between the macroscopic laws and the microscopic structure of matter is included.
Prerequisites: One year of college chemistry and permission of instructor.
Fall, 3 credits

CHE 305 Inorganic Chemistry I

A survey of inorganic chemistry covering various classes of inorganic compounds and reactions with emphasis on the structural aspects. Wherever possible, the subject is treated on the basis of modern concepts of chemical bonding. Thermodynamic and kinetic aspects of inorganic reactions are included. Three lecture hours per week.
Prerequisites: CHE 203 or 205 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

CHE 393, 394 Tutorial in Special Topics in Chemistry

Supervised readings of specialized topics of mutual interest to the student and instructor. Intended for upperclassmen who wish to gain advanced knowledge in a subject which is not included or receives limited attention in other undergraduate courses. Conferences will be arranged to discuss the material and follow the progress of the subject.
Prerequisites: Consent of an instructor and permission of the department.
Fall and Spring, 1 to 3 credits each semester

Graduate Courses

Advanced chemistry students may elect 500-600 level graduate courses in aspects of chemistry of particular interest to them. They should consult the instructor to ascertain the background assumed for the course. See the *Graduate Bulletin* for course descriptions.

CHE 501 Structural Organic Chemistry
CHE 502 Mechanistic Organic Chemistry
CHE 503 Synthetic Organic Chemistry
CHE 511 Inorganic Chemistry I
CHE 512 Inorganic Chemistry II
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
(Formerly WL 101)

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

CLS 113 Survey of Greek Literature in Translation

A study of the development of classical Greek literature from the beginnings to the decline of the Roman Empire; extensive reading of the Greek classics in English translation.
Fall, 3 credits

CLS 114 Survey of Latin Literature in Translation

A study of the development of classical Latin literature from the beginnings to the decline of the Roman Empire; extensive reading of the Latin classics in English translation.
Spring, 3 credits

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

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

CLS 214 Classical Rhetoric and Literary Criticism

A study of the works of Aristotle, Horace, Longinus, and the minor rhetoricians in rhetoric and literary criticism; and of their influence in the rhetorical and literary theory and practice of the Middle Ages, Renaissance, and Neo-Classical Period.
Spring, 3 credits

CLS 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.
Fall, 3 credits. Not offered 1972-73.

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

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

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

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

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

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

INTERDISCIPLINARY PROGRAM IN COMPARATIVE LITERATURE

Assistant Chairman: B. BENNETT

Associate Professor: A. WHITE

The interdisciplinary undergraduate degree program in comparative literature (CLT) is intended to give interested students the opportunity to study two or more national literatures in relation to each other and to related disciplines in the social sciences, sciences, and the arts and humanities.

Students who choose to major in comparative literature should begin in their sophomore year with the required CLT courses described below. These courses are devoted to the systematic study of techniques in, and approaches to, comparative literature and will provide the base upon which individual curricula can be designed.

All comparative literature majors will need competence in at least one language other than English and should plan to take appropriate courses in foreign languages. In certain cases competence may be demonstrated by examination.

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
I. A. CLT 200 Introduction to Comparative Literature	3
B. Two courses in national literature in relation to other literatures	6
* (Recommended are: CLT 207 Literature of Romanticism and CLT 208 19th Century Post-Romantic Literature.)	
C. Two courses in literature in relation to other disciplines.	6
* (Recommended are: CLT 220 Literature and Music and CLT 221 Literature and Philosophy.)	
D. One course in the study of literary form	3
* (Recommended are: CLT 250 Poetry: Ethnopoetics and CLT 251 The Idea of Tragedy.)	
E. One course in national literature in translation or one in a related discipline	3
F. CLT 290 Senior Seminar	3
II. Literature in the Original Language Five courses in literature not in translation, to be chosen in consultation with the student's advisor from at least two national literatures. No more than two courses may be from British or American literature	15
Total	39

Note: CLT courses below the 200 level may not be used to fulfill requirements for the comparative literature major.

COURSES IN COMPARATIVE LITERATURE

CLT 101 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 CLS 111.
Fall, 3 credits

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* In addition to the CLT courses listed in B, C and D above, courses which fulfill these requirements are offered by many departments and vary from semester to semester. Students should consult with program advisors to identify these courses before enrolling.

CLT 103 The Judaeo-Christian Tradition

(Formerly WL 102)
Studies in major texts from the Bible through the medieval period.
3 credits

CLT 105 The Renaissance

(Formerly WL 104)
Studies in major European writers of the Renaissance.
3 credits

CLT 106 The Enlightenment

(Formerly WL 106)
A survey of the phenomenon of the European Enlightenment including an analysis of the rational and critical attack on tradition, and the strong current of sensibility and preromanticism. Readings will include the works of such authors as Montesquieu, Voltaire, Diderot, Rousseau, Goethe, Lessing, Fielding, Johnson.
3 credits

CLT 109 The Modern European Drama

(Formerly WL 346)
A critical examination of the development of dramatic literature in Europe from Ibsen to Anouilh, including a comparative study of such movements as naturalism, existentialism, and expressionism.
3 credits

CLT 200 Introduction to Comparative Literature

This course is designed to introduce the student to the central concepts and problems of comparative literature. A variety of illustrative readings will be considered in historical as well as critical terms.
3 credits

CLT 207 The Literature of Romanticism

Prose and poetry of representative Romanticists spanning the rise of romantic tendencies in 18th century European literature through the romantic revolution of the 19th century.
3 credits

CLT 208 19th Century Post-Romantic Literature

A comparative study of the development of European and American literature from 1832 to 1900.
3 credits

CLT 220 Literature and Music

In this course the relationships and interactions between literature and music will be studied, with special attention to musical settings of literary works. The choice of periods, writers, and composers will vary from semester to semester. May be repeated with permission of department.
3 credits

CLT 221 Literature and Philosophy

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 PHI 273.
3 credits

CLT 250 Poetry: Ethnopoetics

A study of the oral poetry of Africa, Asia, Oceania, and America. This will cover the examination of the role of ritual, magic, and worship in the oral poem, and also an examination of form-structure, content-imagery, and symbolism of traditional poetry.
3 credits

CLT 251 The Idea of Tragedy

A consideration of the theory and practice of tragedy in their interrelations. Study of the classic texts from Sophocles onwards along with analyses of tragedy from Aristotle's *Poetics* onwards. The concept of tragedy will be enlarged to consider its relevance in other genres. The form, operational mode, psychology, and ethics of tragedy will be analyzed comparatively with examples drawn from several literatures.
3 credits

CLT 290 Senior Seminar

The purpose of the senior seminar is to engage the student in independent work in problems of comparative literature and to give a focal point to the work done in separate courses in the comparative literature program.

3 credits

CLT 299 Readings in Literature

Intensive study of a special topic undertaken with close faculty supervision. The purpose of this course is to permit students to do directed study in an area that is not taught in the program's standard curriculum or which is not being taught in a particular semester. May be repeated once.

3 credits

DEPARTMENT OF EARTH AND SPACE SCIENCES

Professors: CARTER *(Coordinator, Geophysics),* LINDSLEY *(Coordinator, Geochemistry),* A. PALMER, PAPIKE *(Chairman),* PREWITT, SCHAEFFER

Associate Professors: BENCE, BRETSKY *(Coordinator, Environmental Paleobiology),* DODD, G. HANSON, HARDORP, OWEN, SHU, M. SIMON

Assistant Professors: GEBEL, GEBELEIN, GOLDSMITH, HÄNNY, KNACKE, LEVINTON

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 advisor 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 above the 200 level.

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 are a minimum requirement. (These credits are in addition to any credits substituted for earth and space science courses under requirement A.)

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.

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 101, 102/112, 104, 106/116, 201, 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 advisor following petition by the student.

In addition to the academic program, the student must complete an honors thesis, which will be evaluated by a committee including the student's advisor and at least one other science faculty member, and must maintain a minimum 3.5 grade point average in all course work in natural sciences and mathematics.

COURSES 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

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

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

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.
Prerequisite: ESS 102 or permission of instructor.
Spring, 3 credits

ESS 112 Physical Geology Laboratory

Three-hour laboratory to include rock and mineral identification, introduction to topographic and geologic maps, and field trips in the vicinity.
Corequisite: ESS 102.
Fall, 1 credit

ESS 114 Oceanography Seminar

Discussion and evaluation of assigned readings from the field of oceanography. For the student considering a career in oceanography to obtain penetrating insights into the diversity of professional preparation and areas of scientific inquiry encompassed within oceanography.
Corequisite: ESS 104.
Fall, 1 credit

ESS 116 Historical Geology Laboratory

An introduction to fossils and to the interpretation of geological history through use of geological maps and cross-sections. One three-hour laboratory per week.
Corequisite: ESS 106.
Spring, 1 credit

Intermediate Courses 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 identifica-

tion. Two lectures and one three-hour laboratory session per week.
Prerequisites: ESS 112, CHE 102 or 104, or permission of instructor.
Fall, 4 credits

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-one-half-hour lectures per week.
Prerequisite: ESS 102.
Fall, 3 credits

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

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

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

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

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

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

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

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

ESS 305 Field Geology

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

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

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

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

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

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

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, intertidal habitats, coral reefs, deep sea environments, and effects of pollution in the ocean will be discussed. Three one-hour lectures per week.
Prerequisite: Any one of the following: BIO 150, 155, 303 or ESS 211.
Spring, 3 credits

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

ESS 326 Mineral Equilibria

After a brief introduction, carbonate systems, oxidation potential and pH 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

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

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

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

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

ESS 347 Solar System Astrophysics

The motions of the planets, comets and asteroids, planetary atmospheres, 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

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

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

ESS 364 Marine Geology

Intensive study of modern theories of the ocean basins, their 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

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

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

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

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 interstellar 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

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, 3 credits, repetitive

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, 3 credits

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, LEKACHMAN, NEUBERGER, STEKLER

Associate Professors: ENTINE, JAMES, KALMAN, KANOVSKY, KRISTEIN, STALEY, VAN ROY, ZSCHOCK, ZWEIG

Assistant Professors: DUSANSKY, L. S. MILLER, NORDELL, SAKBANI, SCHOEPFLE, WICHERS

Lecturers: DAWES, NIENHAUS, SATTINGER

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 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 seven 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

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 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 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 student should indicate to the undergraduate program committee his intention to enroll in the honors program before the beginning of the semester in which he will enter the program, indicating the preliminary era of his research and the faculty member who has agreed to supervise his honors thesis.

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

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, 3 credits

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

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, 3 credits

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

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

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

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

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

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

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

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

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

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.
Spring, 3 credits. Not offered 1972-73.

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

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. Not offered 1972-73.

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

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

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. Not offered 1972-73.

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, 3 credits

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

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

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

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

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

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.
Fall, 3 credits. Not offered 1972-73.

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

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

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

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.
Spring, 3 credits

ECO 320 Mathematical Statistics

An introduction to statistical methods and their properties which are useful in analysis of economic data. Topics include: elements of probability theory and its empirical application; univariate and multivariate distributions; sampling distributions; limiting distributions; point and interval estimation. Regular problem sets and occasional projects are required.
Prerequisites: ECO 100 or 103 or 122; MSM 122 or 123; or permission of instructor.
Fall, 4 credits. Not offered 1972-73.

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 equations 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. Not offered 1972-73.

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

ECO 331 Mathematical Economics I

Application of set theory, metric spaces and topology to the theory of consumer choice, utility and production; neo-classical de-

mand 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

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

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. Not offered 1972-73.

ECO 346 Law and Poverty

Continuing the analysis of ECO 345, this course will focus partcularly 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. Not offered 1972-73.

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

ECO 352 Dynamic Economics

Properties of dynamic economic systems. Some mathematical methods in economic dynamics. Dynamic programming applications to micro and macro problems. Elements of control systems; application to some economic problems.
Prerequisites: ECO 211 or 215, 212 or 216; MSM 122 or 123; or permission of instructor.
Spring, 3 credits

ECO 361 Human Resources I, Education

Education as investment in human capital with concurrent problems of individual decision-making about the optimal level of education; the public and private benefits and costs of education, and the divergence between public and private optimizing of investment levels; education and growth; educational planning.
Prerequisite: ECO 211 or 215 or permission of instructor.
Fall, 3 credits

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

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

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

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 determination; advanced micro theory. Students should check with department faculty for information about sections to be offered in any particular semester.
Prerequisites: Vary with individual sections.
Credit variable, course repeatable for different sections

ECO 382 Topics in Quantitative Economics

Topics in quantitative economics will be offered as student demand and faculty time and interest coincide. Some of the possible semester sections include: forecasting with econometric models; time series and spectral analysis; decision theory; game theory. Students should check with department faculty for information about sections to be offered in any particular semester.
Prerequisites: Vary with individual sections.
Credit variable, course repeatable for different sections

ECO 384 Topics in Development and Comparative Systems

Topics in development and comparative systems will be offered as student demand and faculty time and interest coincide. Some of the possible semester sections include: economic development in modern Europe; China; Southeast Asia; Soviet and Eastern European economies; economic development in the Middle East; Latin America. Students should check with department faculty for information about sections to be offered in any particular semester.
Prerequisites: Vary with individual sections.
Credit variable, course repeatable for different sections

ECO 386 Topics in Political Economy

Topics in political economy will be offered as student demand and faculty time and interest coincide. Some of the possible semester sections include: imperialism; political economy of Latin America; property relations. Students should check with department faculty for information about sections to be offered in any particular semester.
Prerequisites: Vary with individual sections.
Credit variable, course repeatable for different sections

ECO 388 Topics in Applied Economics

Topics in applied economics will be offered as student demand and faculty time and interest coincide. Some of the possible semester sections include: advanced topics in economics of education; capital and financial markets; medical economics. Students should check with department faculty for information about sections to be offered in any particular semester.
Prerequisites: Vary with individual sections.
Credit variable, course repeatable for different sections

ECO 393, 394 Independent Study or Research

A course of study providing opportunities for a student to undertake independently a special project entailing advanced readings, reports and discussion or research on topics or problems of his choosing and with the guidance of an assigned faculty member. When two or more students' work in this course is related, a seminar may be organized covering the area of common interest.
Prerequisite: Permission of department.
Credit variable, course repeatable

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

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

DEPARTMENT OF EDUCATION

Professors: GARDNER, PETERS, SEIFMAN, STOLUROW

Associate Professors: BIRNS, BLOOM, CARTON

Assistant Professors: A. BASKIN, BRENNAN, HEDLEY, MCMULLEN, TIEGEL, WALKER

The Department of Education offers courses of two distinct types: 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 Foundations of Education

Focuses on the major historical, social, economic, and philosophic forces and issues which have affected and are affecting American education.
Fall, 3 credits

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

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

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

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

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

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 crises in America. This course is identical with BLS 251.
Prerequisite: Permission of instructor.
Fall and Spring, 3 credits

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

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

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

EDU 331 Instructional Programming I

An introductory presentation of the concepts, considerations, and procedures in-

volved 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

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

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

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

EDU 350 Supervised Secondary School Student Teaching*

Prospective secondary school teachers receive supervised practice in teaching their subjects to secondary school classes 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 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 director of teacher preparation.
Corequisite: EDU 354.
Fall and Spring, 12 credits

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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.

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, 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 director of teacher preparation.

Fall and Spring, 3 credits

EDU 352 Supervised Elementary School Student Teaching*

Prospective elementary school teachers will receive supervised practice in teaching at the elementary school level 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 director of teacher preparation.

Corequisite: EDU 355.

Fall and Spring, 12 credits

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

EDU 355 Student Teaching Seminar (Elementary Education)

Seminar on problems and issues of teaching at the elementary school level. Analysis of actual problems and issues encountered by the student in his student teaching experience.

Corequisite: EDU 352.

Fall and Spring, 3 credits

EDU 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

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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.

EDU 365 Workshop in Teaching Reading for Elementary School Teachers

An investigation into newer methods and materials of teaching reading with special emphasis on: diagnostic concepts and tools; the impact of socio and psycholinguistics on reading; the role of the parent in the reading process; the role of the teacher in the reading process; the teacher-pupil relationship; grouping patterns in the school and classroom; methods and materials for culturally diverse populations; programs for beginning readers; reading in the content fields; word attack skills in proper perspective; comprehension and critical reading skills.
Prerequisite: Permission of instructor.
Corequisite: EDU 352.
Fall and Spring, 3 credits

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

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 controversy, 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

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

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

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

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

INTERDISCIPLINARY PROGRAM IN ELEMENTARY EDUCATION

Program Chairman: KREUTER

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 (B10 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. Technical 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 3
   (Note: The above three courses should be taken, whenever possible, as a nine credit sequence, the semester (s) before student teaching.)
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 3

   (Note: The above three courses must be taken during the same semester as an 18-credit sequence.)

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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 establishment 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 office of teacher preparation 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.

ELEMENTARY AND SECONDARY SCHOOL TEACHER PREPARATION FACULTY

Professors: KELMAN, KREUTER

Associate Professor: A. LIPTON

Assistant Professors: B. BASKIN, BREDDERMAN, EGELHOFF, M. F. GOLDBERG, LITTKY, MENOSKY, T. ROTH, F. SILVER

Instructor: MASLINOFF

Lecturers: ANNACONE, FARAND, FUSCO, GLASS, GLENNON, HAGGERTY, HARRISON, HEILMAN, KAPLAN, KLEINMAN, KWARTOWITZ, LEDERWAY, LIPSET, LYNCH, MECKLOSKY, MORRIS, O'DEA, RAY, J. SCHIFFER, R. SCHUMANN, G. SMITH, L. STEPHENS, STRASSBERG, TAUB, WASSERMAN, WEDEMEYER

DEPARTMENT OF ENGLISH

Distinguished Professor: KAZIN

Professors: ALTIZER, DICKSON, ERDMAN, H. GOLDBERG, KRANIDAS, LEVIN, LUDWIG, RIBNER, L. SIMPSON, *STAMPFER, STEVENS, J. THOMPSON, WEISENGER

Associate Professors: ABRAMS, DOLAN *(Chairman)*, *FIESS, FRY, R. A. LEVINE, T. MARESCA, R. MILLER, *NELSON, NEUMEYER, PEQUIGNEY, ROGERS, SEARS, *SHAW, ZIMBARDO

Assistant Professors: ANSHEN, AWOONOR, BAKER, BASHFORD, J. BENNETT, BERGSON, CARPENTER, DIBBLE, FORTUNA, HALL, HALPERIN, HARVEY, HUFFMAN, NEWLIN, RASKIN, SCHREIBER, WILSON

Instructor: VANECH

Lecturers: CAMPBELL, GATTEN

* On leave academic year 1972-73.

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
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. One course from the sequence numbered EGL 280-281, with EGL 282 an acceptable alternative for teacher certification candidates in English.	3
e. One additional course elected from those offerings numbered EGL 200-299.	3
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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 advisor 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

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

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

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

EGL 105 Writing Workshop: Fiction

A workshop in the development of writing fiction through practice supplemented by readings.

Prerequisite: Permission of instructor.

Fall and Spring, 3 credits

EGL 106 Writing Workshop: Poetry

A workshop in the development of skills in writing poetry. Poetry writing is supplemented by readings.
Prerequisite: Permission of instructor.
Fall and Spring, 3 credits

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

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

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

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

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

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

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

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

EGL 204 Renaissance Literature in English

The study of English literature of the Renaissance.
Fall and Spring, 3 credits

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

EGL 208 The Age of Dryden

The study of the English literature of the Restoration period.
Spring, 3 credits

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

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

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

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

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

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

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

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

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

EGL 239 Survey of British Literature

The study of British literature from Dryden to the present.
Spring, 3 credits

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.

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

EGL 240 Chaucer

Fall and Spring, 3 credits

EGL 241 Shakespeare

Fall and Spring, 3 credits

EGL 242 Milton

Fall and Spring, 3 credits

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

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

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

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

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

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

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

EGL 250 Major Writers of Earlier American Literature

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

EGL 251 Major Writers of Later American Literature

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

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

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

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.

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

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

EGL 262 Poetry in English

The study of the development of form, theme, and language of poetry in English.
Fall and Spring, 3 credits

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

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

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

EGL 270 History of Literary Criticism

Analytic survey of major texts in the history of European literary theory and criticism.
Spring, 3 credits

EGL 272 Literature in English in Its Relations to Other Literatures

The study of literature in English as it affects and is affected by other literatures.
Fall and Spring, 3 credits

EGL 274 Literature in English in Its Relations to Other Disciplines

The study of literature in English as it affects and is affected by other disciplines, such as anthropology, science, sociology, the history of ideas, theology, and psychology.
3 credits

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

EGL 281 History and Structure of the English Language

The development of the English language from its Indo-European origins. This course is identical with LIN 250.
Prerequisite: EGL 280/LIN 211.
Fall and Spring, 3 credits

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

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

EGL 283 Mathematical Aspects of Linguistics

An introduction to the mathematical concepts and procedures which underlie much contemporary linguistic practice. This course is identical with LIN 301.
Prerequisite: EGL 280/LIN 211.
3 credits

EGL 284 Phonology

An introduction to general phonetics, both articulatory and acoustic, and to phonological theory. This course will include two hours of work in the language laboratory.
3 credits

EGL 285 Problems in Historical English Linguistics

This course will be devoted to tracing the development of selected structures in English from Old English to the present.
3 credits

EGL 286 Introduction to Sociolinguistics

This course will provide an introduction to the interaction between language and society. Examples will be drawn largely from English. This course is identical with LIN 261.
Prerequisites: LIN 102 and 211.
3 credits

EGL 287 Morphological Analysis

The principles of generative phonology, applied morphophonemics, and phonology. This course is identical with LIN 221.
Prerequisite: LIN 102.
3 credits

EGL 288 Discourse Analysis of English

An investigation of the principal theories of grammatical constraints on units larger than the sentence. This course is identical with LIN 320.
Prerequisite: EGL 280/LIN 211.
3 credits

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

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

EGL 292 Senior Honors Seminar

Intensive inquiry and independent study culminating in an honors essay.
Prerequisite: EGL 291.
Spring, 3 credits

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 regis-

tration. The student's work in the tutorial is recorded on the following basis: H (Honors), S (Satisfactory), U (Unsatisfactory).
Prerequisite: Senior standing.
Fall (EGL 293) and Spring (EGL 294), 3 credits each semester

EGL 299 Independent Project

Intensive study of a special topic undertaken with close faculty supervision. Permission of instructor and director of undergraduate studies required.
Fall and Spring, 1 to 3 credits

INTERDISCIPLINARY PROGRAM IN ENVIRONMENTAL STUDIES

Program Chairman: COLLVER

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 courses in three of the following disciplines for a minimum of 12 credits 12

BIO 150 Biology of Organisms
BIO 155 General Ecology
CHE 101/105, 102/106 *or* 103/109, 104/110 Introductory Chemistry
ESS 102 The Earth and the Moon (ESS 112 lab optional)

ESS 103 The Atmosphere (ESS 114 lab optional)
ESS 104 Oceanography
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 courses in three of the following 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 110 Power
POL 200 Political Analysis
SOC 201 Research Methods in Sociology
SOC 205 Principles of Sociology (or SOC 103 Introduction to Sociology)

Group C. Two courses in mathematics, applied statistics, or computer science, for a minimum of six credits. MSC 101 may not be offered toward satisfaction of this requirement . 6

II. Interdisciplinary Courses 11

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

III. Specialty Requirement 12

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

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

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

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: Senior standing and permission of chairman.
Fall and Spring, 3 credits each semester

DEPARTMENT OF FRENCH AND ITALIAN

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

Associate Professors: ALLENTUCH, F. BROWN, MILLS, RIZZUTO, TURSI

Assistant Professors: BLUM, CAPUTO, PETREY, POULIN, RIGGS

Instructors: BECKER, MIGNONE, 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 advisors for help in choosing individual programs.

Placement

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

I. Required courses for a minimum total of 15 credits:	*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 advisor. 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-four additional credits of work in courses which must be at the 300 level and should be chosen in consultation with the departmental advisor. It is strongly recommended that the student select a diversified program.	24
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Teacher Training Program

Students who wish to prepare for certification as secondary school teachers of French should consult appropriate departmental advisors concerning requirements and procedures of 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

(Formerly WL 108, 109)
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

FRN 110 French Literature: The Great Works

(Formerly WL 110)
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

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

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

FRN 191, 192 Intermediate French

An intermediate course in conversation, composition, and the interpretation of French texts.
Prerequisite: FRN 112 or equivalent.
Fall and Spring, 3 credits each semester

FRN 195 Intermediate French (An Intensive Course)

Review of grammar and discussion of simple French texts through reading, writing, and discussion. Language laboratory will supplement class work.
Prerequisite: FRN 115 or equivalent.
Fall and Spring, 5 credits

FRN 197 Intermediate French Conversation

This course may be taken separately or to supplement FRN 192 or FRN 195.
Prerequisite: FRN 115 or equivalent.
Fall and Spring, 2 credits

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

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

FRN 295, 296 Readings in French Literature: Analysis and Interpretation

The course will teach literary analysis and its application to representative texts cho-

sen from various periods of French literature. This work will be supplemented in FRN 295 by complete works from the 19th and 20th centuries, and in FRN 296 by complete works from the 17th and 18th centuries. A required course for majors.
Prerequisite: FRN 195 or equivalent.
Fall and Spring, 3 credits each semester

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

FRN 298 The French Comedy from Molière to Ionesco

Comedy often provides powerful social comment beneath its farcical situations and humorous word-play. Through oral presentations and class discussions, we will study the comic tradition from Molière to the contemporary theatre.
Prerequisite: FRN 192 or 195 or equivalent.
Fall, 3 credits

FRN 299 Studies in French Criticism

Introduction to French literary criticism from 1549 to the present with special emphasis placed upon modern critical approaches to the interpretation of literature (formalistic, structural, psychological, sociological, comparative).
Prerequisite: FRN 192 or 195 or equivalent.
Spring, 3 credits

FRN 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

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

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

Further Studies in French Literature

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

FRN 333 Studies in 16th Century Literature

Fall, 3 credits

FRN 343 French Classical Theatre

Reading of selected works by Corneille, Racine, and Molière.
Fall, 3 credits

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

FRN 351, 352 Studies in 18th Century Literature

Fall and Spring, 3 credits each semester

FRN 361, 362 Studies in 19th Century Literature

Fall and Spring, 3 credits each semester

FRN 373, 374 Studies in 20th Century Literature

Fall and Spring, 3 credits each semester

FRN 382 Literature of Commitment

Literature of commitment and the reaction against commitment in the 20th century.
Fall, 3 credits

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

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

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

COURSES IN ITALIAN

ITL 111, 112 Elementary Italian

An introduction to spoken and written Italian, stressing pronunciation, speaking, comprehension, reading, and writing. Selected texts will be read. Practice in language laboratory supplements class work.
Fall and Spring, 3 credits each semester

ITL 115 Intensive Elementary Italian

An intensive course covering the elementary Italian program (ITL 111, 112) in one semester.
Fall and Spring, 5 credits

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

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

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

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

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

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

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.
Prerequisite: Senior standing, ITL 297, 298 and permission of advisor. ITL 301 may be taken only once.
Fall and Spring, 3 credits

ITL 305 Early Italian Lyric through Dante

(Formerly ITL 341)
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

ITL 306 Petrarch and Boccaccio

(Formerly ITL 342)
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

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

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

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

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

ITL 328 Dante's "Divina Commedia" II

Reading and interpretation of the *Purgatorio* and the *Paradiso.*
Prerequisite: ITL 327.
Spring, 3 credits

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 society, 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

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

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

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

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 advisor. ITL 399 may be taken only once.
Fall and Spring, 1 to 4 credits

DEPARTMENT OF GERMANIC AND SLAVIC LANGUAGES AND LITERATURES

Professors: CZERWINSKI, KARST, [a]KOTT, SCHRÖTER

Associate Professors: R. BROWN, [a]RUSSELL *(Acting Chairman)*, RUPLIN, SJÖBERG

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

Instructor: 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 211-236 or RUS 211-236 for those in the GER 205-208 or RUS 205-208 sequences.

Teacher Certification

Students wishing to prepare for certification as secondary school teachers in Germanic or Slavic languages should consult the staff of the Office of Teacher Preparation. 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.

[a] On leave academic year 1972-73.

Placement in Language Courses for Incoming Freshmen

Students continuing the study of a foreign language started in high school should register for the appropriate college course after consulting a departmental advisor; however, after two years of high school preparation, they will receive no graduation credit for the first course (111) in the same language and after three years of high school preparation they will receive no credit for the first two courses (111, 112) in the same language.

COURSES 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

GER 113 Intensive Elementary German

An intensive course covering the elementary German program (GER 111, 112) in one semester.
Fall and Spring, 6 credits

GER 115, 116 Reading German

This course is 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

GER 151, 152 Intermediate German I, II

The reading and interpretation of German texts, with a review of German grammar, composition, and conversation. The student gains an acquaintance with the various literary genres through examples drawn from representative German authors. Work in the language laboratory will further develop audiolingual skills.
Prerequisite: GER 112 or equivalent.
Fall and Spring, 3 credits each semester

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

GER 197, 198 German Conversation and Composition

(Formerly GER 221, 222)
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

GER 199 German Civilization and Culture

An introduction to the customs, history, arts, culture, and linguistic history of the German 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. Some attention will be paid to Germanic "sub-cultures" such as the Amish, Germans in America, Yiddish (linguistically), and Flemish.
Fall, 3 credits

GER 202 History of the German Language

(Formerly GER 332)
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 phonnology) . 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

GER 203 Introduction to Germanic Studies

(Formerly GER 181)
Using selected short texts easily read and understood by students whose background in German may not be great, this course is intended to introduce students to the enjoyment of German literature and the techniques of literary appreciation and criticism.
Prerequisite: GER 152 or 195 or permission of instructor.
Fall, 3 credits

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

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

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

GER 209, 210 Advanced German Conversation and Composition

(Formerly GER 321, 322)
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

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

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 Aufklarung; GER 225 Sturm und 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

GER 231-236 Offerings in Translation

GER 231 German Master Works; GER 232 German Novel; GER 233 Mann Brothers; GER 234 Hesse; GER 235 Post-War Litera-

ture: West Germany; GER 236 Post-War Literature: East Germany
Schedule to be announced, 3 credits each

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

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

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

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

SWE 231, 232 Offerings in Translation

(Formerly SWE 311, 312)
SWE 231 Scandinavian Masterworks (Fall); SWE 232 Scandinavian Novel (Spring)
3 credits each semester

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

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

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

RUS 113 Intensive Elementary Russian

An intensive course covering the elementary Russian program (RUS 111, 112) in one semester.
Fall, 6 credits

RUS 115, 116 Reading Russian I, II

This course is designed to teach the student to read and translate Russian expository prose of moderate difficulty. It includes practice in translating ideas into the appropriate technical terminology. This course is intended to prepare the graduate student for the Ph.D. proficiency requirement, but is also open to undergraduates who do not intend to major in Russian.
Fall and Spring, 3 credits each semester

RUS 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

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

RUS 197, 198 Russian Conversation and Composition

(Formerly RUS 153, 154)
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

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

RUS 202 History of the Russian Language

(Formerly RUS 342)
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

RUS 203 Introduction to Slavic Studies

(Formerly RUS 231)
Using selected short texts easily read and understood by students whose background in Russian may not be great, this course is intended to introduce students to the enjoyment of Russian literature and the techniques of literary appreciation and criticism.
Prerequisite: RUS 152 or RUS 195 or permission of instructor.
Fall, 3 credits

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

RUS 205, 206, 207 Genre Studies

Intensive study of specific genres and their sub-genres. All work will be done in Rus-

sian. 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

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

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

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 Chekov; 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

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

RUS 231-236 Offerings in Translation

RUS 231 Russian Master Works; RUS 232 Russian Novel; RUS 233 Tolstoy; RUS 234 Dostoevsky; RUS 235, 236 Comparative Slavic Literature I, II
Schedule to be announced, 3 credits each

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

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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

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

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

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

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

COURSES IN HEBREW AND CIVILIZATION OF ISRAEL

Instructor: S. D. SPERLING

HBW 111, 112 Elementary Hebrew

An introduction to modern Hebrew as currently spoken and written in Israel, stressing pronunciation, speaking, listening comprehension, reading, and writing.
Fall and Spring, 3 credits each semester

HBW 151, 152 Intermediate Hebrew

An intermediate course in conversation, composition, and the reading of texts in modern Hebrew.
Prerequisites: HBW 111, 112 or permission of instructor.
Fall and Spring, 3 credits each semester

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

HBW 222 Advanced Hebrew II

Readings in modern Hebrew authors. Oral and written reports. Discussion conducted mainly in Hebrew.
Prerequisite: HBW 221 or permission of instructor.
Spring, 3 credits

HBW 285 Classical Hebrew

A study of texts in the classical dialect of Hebrew as found in biblical and extra-biblical sources.
Prerequisite: HBW 221 or permission of instructor.
Fall, 3 credits

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

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.
Fall, 3 credits. For elective credit only.

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.
Spring, 3 credits. For elective credit only.

DEPARTMENT OF HISPANIC LANGUAGES AND LITERATURE

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

Associate Professors: GIORDANO, MCKENNA, SILVER

Assistant Professors: DAVIS, MERMALL, 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 advisory 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 Culture 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 his 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 advisor 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 de-

partmental advisor 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 prepare for certification as secondary school teachers of Spanish should consult appropriate departmental advisors 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 fundamental 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 Literatures

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 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.
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, CHINCHILLA-AGUILAR, LAMPARD, [a]MAIN, SEMMEL, TAYLOR, [a]TRASK *(Chairman)*

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

Assistant Professors: COWAN, GARBER, HAMNETT, KAVENAGH *(Documents Collector)*, KNIGHT, LEMAY, MCCARTHY, RAPP, TURNER

Instructor: DEMUTH
Lecturer: 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
1. Two one-semester introductory courses at Level I (HIS 101-160)	6
2. Eight one-semester advanced courses selected from Levels II (HIS 161-299), III (HIS 300-399), and IV (HIS 400-499), of which at least six credits must be selected from the Levels III or IV, excluding HIS 397, 398, 399.	24

Note: Included in the total 30 hours as prescribed above must be nine credits in non-U.S. history.

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.

[a] On leave academic year 1972-73.

COURSES IN HISTORY

Please Note: Level I courses (HIS 101-160) are designed for freshman 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.

HIS 101 European Civilization from the Renaissance to the French Revolution

A study of European ideas and institutions from the Renaissance to the French Revolution.
Fall, 3 credits

HIS 102 The Civilization of Modern Europe

A study of European ideas and institutions during the 19th and 20th centuries: the growth of industrialism and of democracy; the Marxist challenge and the Russian Revolution; the great world wars and the waning of European hegemony.
Spring, 3 credits

HIS 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.
Prerequisite for 104: HIS 103 or permission of instructor.
Fall and Spring, 3 credits each semester. Not offered 1972-73.

HIS 105 American Historical Writing

An introduction to American history through an examination of the varieties of historical writings about the American past.
Fall, 3 credits

HIS 107 America in the 1960's

An introduction to the study of history through an analysis of contemporary American politics and culture from the Eisenhower years to the present.
Spring, 3 credits

HIS 119 The Urban Experience

An examination of the city in history with emphasis on the human experience. Topics will include politics, ethnic acculturation, race relations, and city planning. Course will stress the interdisciplinary nature of urban history through a wide range of readings.
Spring, 3 credits

HIS 127 The Culture and Conflict of Colonial Societies

An examination of the variety of problems which confronted colonizers and colonized in areas other than the United States from about the 16th century to the 20th century; the response of non-Europeans to the integration of world cultures, and the challenges and conflicts of the colonial situation.
Fall, 3 credits

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 1972-73.

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 1972-73.

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 1972-73.

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 1972-73.

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. Not offered 1972-73.

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 1972-73.

HIS 138 Perspectives in European History

A study of selected topics and debates in European history with special reference to a specific national case. Problems span the period from the rise of urban centers in the Middle Ages to the rise of fascism in the 20th century.
Spring, 3 credits

HIS 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 1972-73.

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

HIS 160 History of American Education

An analysis of various approaches to the study of the history of American education through an examination of selected histories of education in America. Emphasis will be placed on developing an understanding of the material of the historical writing (i.e., the events and the characteristics of the events), the principle or principles according to which the subject has been subdivided, and the aims of the particular history. Histories of education selected for study will be chosen from among the writings of such authors as Bernard Bailyn, Maxine Greene, Lawrence A. Cremin, Raymond Callahan, and others. This course is identical with EDU 160.
Fall, 3 credits

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.
Spring, 3 credits

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

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

HIS 193 Latin America to 1825

The Spanish and Portuguese colonies in the New World, with emphasis on exploration, settlement, institutions, and the struggle for independence.
Fall, 3 credits

HIS 194 Latin America Since 1825

The evaluation of Latin America since independence, with emphasis on political, economic, and social problems.
Spring, 3 credits

HIS 195 England from 1066 to 1688

The development of English society will be traced from the Norman Conquest to the "Glorious Revolution" with special attention to the feudal constitution, the evolution of Parliament, the Civil War, and the Commercial Revolution.
Fall, 3 credits

HIS 196 England Since 1688

The transformation of English society by the Industrial Revolution, the development of parliamentary politics and democracy, the growth of imperial power, and the readjustment to 20th century realities.
Spring, 3 credits

HIS 197 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

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

HIS 200 The Ancient Near East and Early Greece

The development of early civilizations in the eastern Mediterranean area from the Neolithicum to the rise of the Persian Empire. Special emphasis will be put on Greece in the late Bronze Age and the Age of Homer.
Spring, 3 credits. Not offered 1972-73.

HIS 201 History of Classical Greece and the Hellenistic World

A survey of the history of the Greeks and Greek civilization from the Archaic Age through its Classical and Hellenistic periods.
Prerequisite: HIS 200 or some background in early Greek history.
Fall, 3 credits. Not offered 1972-73.

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 1972-73.

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 1972-73.

HIS 204 Medieval History, 300-1100

European history from the decline of Rome to the 11th century, including the rise of Christianity, Byzantium, Islam, the Gregorian reform, and feudalism.
Fall, 3 credits

HIS 205 The High Middle Ages, 1100-1400

The High Middle Ages, including the crusades, courtly love, the 12th century Renaissance, scholasticism, Franciscanism, and the Inquisition.
Spring, 3 credits

HIS 206 Humanism and Renaissance

The study of the Italian Renaissance with particular emphasis on the intellectual history of the period. Non-Italian thinkers who played a role in the intellectual movements of the time will also be considered.
Fall, 3 credits

HIS 207 The Age of Reformation

A study of pre-reformation currents such as mysticism and humanism, followed by an examination of the 16th century reformations. The course also includes some other 16th century intellectual movements.
Spring, 3 credits

HIS 208 Europe in the 17th Century

A comparative examination of the societies of western Europe in a period of marked stress and change.
Spring, 3 credits

HIS 209 Europe 1815-1914

European history from the Congress of Vienna to the outbreak of the First World War, with emphasis on political and social developments, but also including economic and cultural trends.
Fall, 3 credits. Not offered 1972-73.

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. Not offered 1972-73.

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. Not offered 1972-73.

HIS 212 American Colonial Society

Political, economic, social, and cultural characteristics of the colonies during the 18th century.
Spring, 3 credits. Not offered 1972-73.

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.
Fall, 3 credits

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 1972-73.

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 1972-73.

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 1972-73.

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 1972-73.

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

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.
Spring, 3 credits

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

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 1972-73.

HIS 222 Modern Andean Republics

Central aspects of the political and intellectual development of the Andean countries from Colombia to Chile viewed within their social and economic environment in the 19th and 20th centuries.
Spring, 3 credits. Not offered 1972-73.

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. Not offered 1972-73.

HIS 224 Modern Mexico

The social, economic, and political history of Mexico from 1876 to the present with emphasis on the background, development, and aftermath of the Revolution of 1910.
Spring, 3 credits

HIS 225 Social and Economic History of Colonial Spanish America

Social and economic practices in the Spanish New World Empire. The political effects of these new forms, as well as the Crown's efforts to control them directly will be examined. Events leading to the Independence period will also be studied.
Spring, 3 credits. Not offered 1972-73.

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 1972-73.

HIS 228 Modern Brazil

Brazil from 1889 to the present: the old Republic; the Liberal Alliance and the Vargas regime; post-Vargas Brazil; and social, economic, and cultural developments will be examined.
Fall, 3 credits

HIS 229 Argentina Since 1810

The political, economic, and social history of Argentina from the end of the colonial period to the present with special attention to the Rosas tyranny, the "Argentine miracle" of development from 1880 to 1914, and the background, evolution, and aftermath of the Perón regime.
Fall, 3 credits. Not offered 1972-73.

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 1972-73.

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 1972-73.

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 1972-73.

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 1972-73.

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 1972-73.

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 1972-73.

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 1972-73.

HIS 240 History of the British Empire

Examines British control over dependencies in Africa, Asia, and the Pacific since the 18th century, through comparative study of imperial advance, colonial policy, plural societies, resistance, transfer of power.
Fall, 3 credits

HIS 241 Kievan and Muscovite Russia

Russian history from 10th century origins through the 17th century. Particular attention will be centered in Kievan civilization, the Tatar yoke, the rise of the Muscovite service state, and the Time of Troubles.
Spring, 3 credits. Not offered 1972-73.

HIS 242 Imperial Russia

The political, social, and cultural developments from Peter the Great to the Russian Revolution with emphasis on the unique institutional structure of Tsarist Russia and the problem of its relations with the West.
Fall, 3 credits

HIS 243 Soviet Russia

The ideological and social background of the Russian Revolution and the evolution of Soviet rule, the problems of industrialization, the relations with the capitalist West, and totalitarian control over society.
Spring, 3 credits

HIS 244 East Central Europe, 1453-1945

A survey of the territorial belt between the German and Russian power bases; the 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 1972-73.

HIS 249 European Economic History in the Pre-Industrial Age

European economic development from the Middle Ages to the 18th century. Topics include medieval agriculture, merchant capitalism and the rise of urban centers, Renaissance economy and society, the decline of the Mediterranean, and the economic crises of the Age of Mercantilism.
Fall, 3 credits

HIS 250 European Economic History in the Industrial Age

The causes and consequences of modernization are the subjects of this course. Alternative theories of development are used to analyze technological change, economic-demographic interrelationships, social effects of modernization, class structure, and problems of underdevelopment.
Spring, 3 credits

HIS 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

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

HIS 254 Social and Intellectual History of Europe, 1848-Present

Social and political thought in post-1848 Europe with particular reference to the social and political implications of Darwinism, socialism, new conservatism, Freudianism, and the varieties of existential thought.
Spring, 3 credits

HIS 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

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 1972-73.

HIS 258 History of the Physical Sciences II: The Structure of Matter

The course will trace the growth of alchemy in the Arabic Empire and the European Renaissance, chemistry in the 19th century, and quantum mechanics in the 20th century. The general patterns of change which emerged in physics and chemistry will be emphasized. This course is intended for students with a scientific background.
Spring, 3 credits

HIS 259 History of Biology

The course will examine ancient Greek ideas about the nature of life, the development of taxonomy, embryology, cytology, Darwinism, biochemical biology, and the debate between vitalism and mechanism. This course is identical with BIO 159.
Prerequisite: Six credit hours of biology or permission of instructor.
Fall, 3 credits

HIS 261 Intellectual History of China

Major schools of Chinese thought from the classical era of Chinese philosophy through the 19th century to the modern age of Mao Tse-tung and their influence upon the historical development of Chinese society.
Prerequisite: HIS 197 recommended.
Fall, 3 credits. Not offered 1972-73.

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.
Spring, 3 credits

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

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

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 1972-73.

HIS 266 Modern Japan, 1868-Present

Political, social, economic, and cultural history of Japan with emphasis upon the Meiji restoration, industrialization, and its impact on society, imperialistic expansion, the Second World War, and Japanese resurgence in the postwar era.
Spring, 3 credits. Not offered 1972-73.

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

HIS 270 Development of American Industrial Society Since 1860

The industrial transformation of economy and society since 1860. Emphasis is on factors contributing to economic growth and instability, the development of corporate organization, and the changing character of public policy.
Spring, 3 credits

HIS 271 American Constitutional Origins

The course will examine the English and colonial foundations of American constitutionalism, formation of the federal Constitution, the instituting of new government, and the rise of political democracy.
Fall, 3 credits. Not offered 1972-73.

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. Not offered 1972-73.

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.
Spring, 3 credits

HIS 274 Social and Intellectual History of the United States Since 1865

A study of the development of American institutions and thought in the years since the Civil War.
Fall, 3 credits

HIS 275 History of U.S. Foreign Relations, 1774-1900

American foreign policy and diplomacy from 1774 to 1900 in terms of acquisition and confirmation of independence; geographical expansion and economic growth; achievement of great power capabilities.
Fall, 3 credits. Not offered 1972-73.

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. Not offered 1972-73.

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. Not offered 1972-73.

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. Not offered 1972-73.

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

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

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 1972-73.

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 1972-73.

HIS 283 Modern France, 1815-1900

The French nation's search for definition from the Restoration to the Dreyfus affair, with much attention given to the social and economic background of political change.
Fall, 3 credits

HIS 284 Modern France, 1900-Present

The French nation's response to the traumas of world war, depression, and decolonization, and the challenge of industrial society from the Dreyfus affair to the Fifth Republic.
Spring, 3 credits

HIS 285 Germany, 1806-1890

Germany from the Napoleonic period, through unification and the founding of the Empire, to Bismarck's dismissal.
Fall, 3 credits

HIS 286 Germany, 1890 to the Present

Germany from Bismarck's dismissal, through the Wilhelmian period, the First World War, the Weimar Republic and the Third Reich, to and beyond the Second World War. Political and social aspects and economic and cultural trends will be included in the investigation.
Spring, 3 credits

HIS 287 History of Italy, 476-1960

The development of Italian civilization from the fall of Rome through the age of the city-states, the centuries of foreign domination, industrialization and the Risorgimento, fascism, and the "economic miracle."
Spring, 3 credits. Not offered 1972-73.

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

HIS 291 History of Africa South of the Sahara

Africa, 800-1800; the quickening pace of internal change and external contact, 1800-1880; European conquest and administration, 1880-1945; the end of empire and the recovery of independence.
Spring, 3 credits

HIS 292 Population and the Family in Europe

Studies in population trends and the history of the family unit in Europe from the Middle Ages to the 20th century. Topics include the control of family size, family wealth, child-rearing, demographic crises, social class characteristics, and theories of population change.
Fall, 3 credits. Not offered 1972-73.

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.
Spring, 3 credits

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

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. Not offered 1972-73.

HIS 308 Problems in Modern European History Since 1870

A study of the interrelations of politics,

ideas, and socioeconomic forces in an age of transformation and conflict.
Prerequisite: The course assumes some background in modern European history.
Fall, 3 credits

HIS 309 Problems 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

HIS 311 Topics in Colonial American History

Selected topics in the development of colonial society. Use of primary source materials is stressed.
Fall, 3 credits. Not offered 1972-73.

HIS 312 Topics in 18th Century Colonial American Society

Topics concerning the social and intellectual growth of the American colonies up to the revolutionary period. The use and interpretation of primary source materials will be stressed.
Prerequisite: This course assumes a background in American colonial history.
Fall, 3 credits

HIS 313 Topics in Revolutionary America

The students will investigate through reading in primary and secondary sources and through discussions, major aspects of the revolutionary era, including economic, social, political, and cultural characteristics.
Prerequisite: HIS 213 or permission of instructor.
Spring, 3 credits. Not offered 1972-73.

HIS 315 Topics in Jacksonian America, 1815-1850

Discussions and independent research on such leading problems of the Jacksonian period as the different types of reform movements and the influence on society of American conceptions of the west.
Prerequisites: HIS 215 and permission of instructor.
Spring, 3 credits. Not offered 1972-73.

HIS 317 Topics in U.S. History, 1877-1920

Selected topics in late 19th and early 20th century America with emphasis on the progressive era. Primarily reading, discussion, and independent research.
Prerequisite: HIS 192 or 217 or permission of instructor.
Spring, 3 credits

HIS 319 Studies in the History of Urbanization

Selected topics in the history of urbanization in the United States, with special reference to demographic, economic, and organizational aspects of population concentration and the process of city building.
Prerequisite: HIS 219 or permission of instructor.
Spring, 3 credits

HIS 326 Topics in the Cultural History of Latin America

The course will include such topics as the Baroque Period, the Enlightenment, the ideals of independence, positivism, French and American influences, modernism, and the search for identity.
Spring, 3 credits

HIS 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. This course is identical with SSC 330.
Prerequisite: Nine hours of Latin American history or its equivalent.
Fall, 3 credits

HIS 342 Topics in the History of the Russian Revolution and the Soviet Union

Advanced study on selected problems of the Russian Revolution of 1917 and the development of the Soviet Union. Students will be encouraged to do independent research and writing.
Prerequisite: HIS 241 or 242 or 243, or permission of instructor.
Fall, 3 credits

HIS 351 Topics in the Social History of Science

Topics covered will be the major problems in the social history of science; the social factors controlling its initial development; the professionalization of science; the role of government; its growth.
Spring, 3 credits

HIS 353 Topics in the History of European Conservatism

An examination of the major traditions and theories of European conservatism from Thomas Aquinas to the radical right theories of the 20th century.
Prerequisite: This course assumes a fair knowledge of European history and European thought in the modern period.
Spring, 3 credits

HIS 355 Topics in the Expansion of Europe

An examination of the interrelationship of cultures in the pre-industrial age, with emphasis on the expansion of Europeans into the wider world.
Spring, 3 credits. Not offered 1972-73.

HIS 362 Topics in the History of Chinese Communism

This course will examine in depth major topics related to Chinese communism, such as Maoism as a revolutionary and developmental strategy; United Front tactics; agrarian reforms; ideological control; agricultural and industrial planning; foreign policy; domestic politics, etc.
Prerequisite: HIS 198 or HIS 262.
Fall, 3 credits

HIS 363 Nationalism in Southeast Asia

This course will examine the development of nationalist movements in Southeast Asia both comparatively and in individual case studies.
Prerequisite: This course assumes some background in Southeast Asian history.
Fall, 3 credits

HIS 364 Problems in the Modern History of Southeast Asia

An examination of particular political, social, economic, and cultural problems of modern Southeast Asian countries.
Prerequisite: This course assumes some background in Southeast Asian history.
Spring, 3 credits

HIS 371 Topics in American Constitutional History

A study in depth of selected topics in the constitutional history of the United States from 18th century origins to the present.
Prerequisite: HIS 271 or 272 or permission of instructor.
Fall, 3 credits. Not offered 1972-73.

HIS 373 Topics in American Social and Intellectual History

A study of selected topics in American social and intellectual history through reading, discussion, and independent research. Topics will vary in different years.
Prerequisite: HIS 273 or 274 or permission of instructor.
Fall, 3 credits. Not offered 1972-73.

HIS 378 Topics in American Labor History

The ideological, economic, and sociological factors which have shaped the American labor movement, and the relationship of the labor movement to American society as a whole and to the contemporary crisis.
Prerequisite: HIS 277 or 278, or HIS 269 or HIS 270, or permission of instructor.
Fall, 3 credits

HIS 379 Topics in Afro-American History

Advanced study of selected problems of the role and status of the Afro-American in U.S. history. Students will develop their own critical analysis of the subject through independent research and writing.
Prerequisite: HIS 279 or HIS 280 or permission of instructor.
Fall, 3 credits

HIS 382 Topics in the Ancien Régime and the French Revolution

A study of selected topics on the crises of French government and society in the 17th and 18th centuries including the French Revolution.

Prerequisite: HIS 281 or 282 or permission of instructor.
Fall, 3 credits

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

HIS 397 The Teaching of History

A study of history as a subject taught in the secondary schools; the nature of the discipline; curricula models; scope and sequence of topics offered; new programs of history instruction, etc. Designed for prospective teachers of history in secondary schools.
Prerequisite: Five courses in history above Level I.
Fall, 3 credits

HIS 398 History Teaching Strategies

An examination of the instructional methods and materials for teaching history at the secondary school level. Designed for prospective teachers of history in secondary schools.
Prerequisite: HIS 397.
Spring, 3 credits. Not offered 1972-73.

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

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

HIS 411 Colloquium in American History

Fall, 3 credits

HIS 412 Colloquium in American History

Spring, 3 credits

HIS 413 Colloquium in American History

Spring, 3 credits

HIS 421 Colloquium in Latin American History

Fall, 3 credits

HIS 422 Colloquium in Latin American History

Spring, 3 credits

HIS 430 Colloquium in European History

Fall, 3 credits

HIS 431 Colloquium in European History

Fall, 3 credits

HIS 432 Colloquium in European History

Spring, 3 credits

HIS 433 Colloquium in European History

Spring, 3 credits

HIS 461 Colloquium in Asian History

Fall, 3 credits. Not offered 1972-73.

HIS 462 Colloquium in Asian History

Spring, 3 credits. Not offered 1972-73.

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 101 Contemporary American University

An examination of the purposes, resources, and problems of the contemporary American university. Enrollment limited to freshmen.
Fall, 1 to 3 credits. For elective credit only.

INT 150, 151 Civilization of Israel I, II

(For course description, see alphabetical listing: Courses in Hebrew and Civilization of Israel.)

INT 211 Science and the Future of Man

An examination of man in relation to his environment and to scientific evolution. Lecture topics will include the population explosion, hazards of nuclear radiation, air and water pollution, man and the soil, educational obsolescence.
Fall and Spring, 3 credits. For elective credit only.

INT 215 Contemporary American Literature and Society

An interdisciplinary course in the humanities offered in Dreiser College, largely concerned with contemporary American literature and society and their interrelationships. Some themes to be discussed include: The American Dream, Culture and Technology, Youth, Obsessions, and the Black Experience.
Prerequisite: Junior or senior standing.
Spring, 3 credits. For elective credit only.

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.

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.

INTERDISCIPLINARY PROGRAM IN IBERO-AMERICAN STUDIES

Director: SCHUYLER

Faculty Advisory Committee:

Anthropology—CARRASCO, WEIGAND

Art—CASTEDO

Economics—ZSCHOCK

History—R. LEVINE

Puerto Rican Studies—STRATMAN

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 advisor, 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. Every effort will be made to assist qualified students majoring in Ibero-American studies to spend at least one semester abroad but this will not be a specific requirement.

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 advisor 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 student is expected to pass a proficiency test, under normal circumstances prior to beginning his senior year, measuring his 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 advisors, 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-Colombian Art

Economics
ECO 225 Economic Development
ECO 284 Topics in Area Studies (Latin America)
ECO 386 Topics in Political Economy (Latin America)

History
HIS 127 The Culture and Conflict of Colonial Societies
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 225 Social and Economic History of Colonial Spanish America

HIS 227 Colonial and Neo-Colonial Brazil
HIS 228 Modern Brazil
HIS 229 Argentina Since 1810
HIS 289, 290 History of Spain, 711-1808
HIS 325 Cultural History of Latin America I
HIS 326 Cultural History of Latin America II
HIS 330 Topics in Modern Latin America
HIS 355 Topics in the Expansion of Europe
HIS 421 Colloquium in Latin American History I
HIS 422 Colloquium in Latin American History II

Linguistics
LIN 251 History of the Spanish Language

Political Science
POL 209 Politics in Developing Areas
POL 214 Politics of Latin America
POL 215 Contemporary Political Systems in Latin America
POL 223 Latin America and the United States
POL 226 Problems of Politics and International Relations in Latin America
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 299 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

* The specific content of courses will be announced annually and printed in the registrar's class schedule as a subtitle each semester.

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 paterns 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

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

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 advisor
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

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

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 and Spring, 3 credits

LIN 204 Phonology

This course deals with the problem of 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

LIN 211 Introduction to Syntax

An introduction to transformational-generative grammar. Special attention will be given to the grammar of English. This course is identical with EGL 280.
Fall and Spring, 3 credits

LIN 221 Morphological Analysis

The principles of generative phonology, applied morphophonemics, and morphology. This course is identical with EGL 287.
Prerequisite: LIN 102.
Fall and Spring, 3 credits

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

LIN 250 History and Structure of the English Language

The development of the English language from its Indo-European origins. This course is identical with EGL 281.
Prerequiste: LIN 211/EGL 280.
Fall and Spring, 3 credits

LIN 251 History of the Spanish Language

This course is identical with SPN 324.
Prerequisite: LIN 102.
Fall and Spring, 3 credits

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

LIN 261 Introduction to Sociolinguistics

An examination of the interaction between language and society. Examples will be drawn largely from English. This course is identical with EGL 286.
Prerequisites: LIN 102 and LIN 211.
Fall and Spring, 3 credits

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

LIN 301 Mathematical Aspects of Linguistics

An introduction to the mathematical concepts and procedures which underlie much contemporary linguistic practice. This course is identical with EGL 283.
Prerequisite: LIN 211/EGL 280.
Fall and Spring, 3 credits

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

LIN 320 Discourse Analysis of English

An investigation of the principal theories of grammatical constraints on units larger than the sentence. This course is identical with EGL 288.

Prerequisite: LIN 211/EGL 280.
Fall and Spring, 3 credits

LIN 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 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

LIN 371 Field Methods in Linguistics

Students will learn techniques of writing a grammar of a language unknown to them by working with a speaker of that language. This course is identical with ANT 371.
Prerequisites: LIN 201 and LIN 211.
Spring, 3 credits

DIVISION OF MATHEMATICAL SCIENCES

Acting Provost: I. KRA

Director of Teacher Preparation: P. KUMPEL

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

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. He 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 psychological 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, THAMPURAN

Assistant Professor: 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 behav-

ioral 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 non-linear 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 MSM and MSC courses numbered 200 and above. Recommended but not required are MSM 201, 211, 216, 301; MSC 201.)

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 226, 227, 301, 302, 316, 317, 321, 351, 352, 371 and MSI 201, 202; and Area II—operations research and social science related mathematics—MSA 201, 202, 251, 252, 324, 325, 331, 333, 334. However, some courses (especially MSA 317 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, 102 Introduction to Finite Mathematical Structures I, II

This course develops the concepts and techniques which are basic in any consideration of the mathematical models which are currently being used in such fields as anthropology, biology, economics, sociology, psychology, and linguistics. The theories discussed will be illustrated by problems from these areas. Topics to be covered include matrix algebra, linear programming, game theory, probability theory (including Markov chains), finite graph theory, and optimization.
Fall and Spring, 3 credits each semester

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

[MSI 155 Mathematics for Engineers II]

(See description under Interdepartmental Courses in Mathematical Sciences.)

MSA 201, 202 Finite Mathematical Structures I, II

This course introduces the student to graph theory and combinatorial analysis. The emphasis is on solving applied problems rather than on theorems and proofs. Techniques used in problem-solving will include generating functions, recurrence relations, and network flows. This course develops the type of mathematical thinking that is fundamental to computer science and operations research.
Corequisite: MSM 151.
Fall and Spring, 3 credits each semester

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

(See description under Interdepartmental Courses in Mathematical Sciences.)

MSA 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

MSA 266 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.
Spring, 3 credits

MSA 227 Approximation Theory

Smoothing of data, least squares methods, interpolation, polynomial approximation, and quadrature formulas.
Prerequisite: MSM 152.
Fall, 3 credits

MSA 250 Introduction to Mathematical Statistics

Probability spaces, random variables, algebra of expectations, random sampling, law of large numbers, estimation of parameters, confidence intervals, regression, hypothesis testing. Students interested in probability theory and a more thorough treatment of statistical analysis should take MSA 251, 252. (MSA 250 may not be taken for credit in addition to MSA 251, 252.)
Prerequisite: MSM 121 or 191.
Fall and Spring, 3 credits

MSA 251, 252 Probability and Statistics I, II

Finite, discrete, and continuous probability distributions; random variables; conditional probability; multivariate distributions; laws of large numbers; central limit theorem. Statistical application: random sampling, estimation, significance testing, hypothesis testing, regression correlation. Further topics.
Prerequisite: MSM 121.
Fall and Spring, 3 credits each semester

MSA 301, 302 Principles and Techniques of Applied Mathematics I, II

Linear operators and spectral theory applied to differential operators. Eigenfunction expansions, Green's functions and distributions: integral transforms.
Prerequisites: MSM 152 and permission of instructor.
Fall and Spring, 3 credits each semester

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.
Prerequisites: MSC 101, MSM 152.
Fall, 3 credits

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

MSA 324 Special Functions of Applied Mathematics

(Formerly MSA 216)
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

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 251, MSM 151.
Fall, 3 credits

MSA 331 Mathematical Models in the Social Sciences

Methods of mathematical modeling with particular emphasis given to areas such as ecology, sociology, economics, and psychology. Topics chosen will depend on the background and interest of the class.

Prerequisites: MSA 251 and permission of instructor.
Spring, 3 credits

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

MSM 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

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

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 student have an average grade of B in his courses and that he obtain the agreement of a faculty member to supervise the research.
Prerequisite: Permission of instructor and department.
Fall and Spring, 3 credits

DEPARTMENT OF COMPUTER SCIENCE

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

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

Assistant Professors: AKKOYUNLU, FIDUCCIA

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,

[a] On leave academic year 1972-73.

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 secondary interests.

Pass/No Credit Option

A student may, with permission of his advisor, 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

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

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

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

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

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

DEPARTMENT OF MATHEMATICS

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

Associate Professors: EBIN, W. FOX, FRIED, LAUFER, MEYER, OSHER, PHILLIPS, THORPE *(Director of the Undergraduate Program)*, ZAUSTINSKY

Assistant Professors: L. BROWN, FRANK, HELTON, HOWE, KUMPEL, RALLIS, ROITBERG, STONE, YAO

Research Instructor: LYNCH

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 his 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 undergraduate studies of the Mathematics Department during the junior year. The director of the undergraduate program in consultation with the student and his advisor will then designate a set of courses that will constitute the student's honors program. These courses will normally be: MSM 391 (or 392) and 212, 301, 302, 312, 323.

Every honors program must include either MSM 391 or 392, and must consist of six courses selected from among MSM 212 and MSM courses numbered 300 or above. First year graduate courses may be substituted for the corresponding 300-level courses. Thus, a student may include in his 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.

Old Students and New Major Program

The program described above is for students in the class of 1974 and in subsequent classes. Other students may choose between the program described here and the program described in the *1970-71 Undergraduate Bulletin*. A course will be considered a mathematics course for students electing to follow the old program if it is currently offered by the Department of Mathematics (all MSM and MSI courses) or if it was previously offered by the Department of Mathematics (MSA 251 and 252).

COURSES IN MATHEMATICS

Note: No mathematics course may be taken for credit after credit has been obtained in a course for which it is prerequisite. Exceptions will be made only with written permission of the director of the undergraduate program in mathematics.

MSM 101, 102 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 courses in the sequence MSM 121, 122, 151, 152. It may not be counted toward the general university requirement in natural science. Prerequisites: MSM 101 may be taken only by students who have *at most* three years of secondary school mathematics, except by permission of instructor. Permission of instructor is always required for MSM 102. Some students who complete MSM 101 may not be allowed to continue with MSM 102, but will be advised to take a more advanced mathematics course, for example, MSM 121.
Fall and Spring, 3 credits each semester. (For elective credit only.)

MSM 111 Introductory Mathematics I

A course designed to acquaint the student with the flavor of mathematics, what mathematics is and what modern mathematicians do, through consideration of specific topics chosen from: logic, set theory, elementary number theory, algebraic systems. MSM 111 and MSM 112 are intended primarily for those who do not plan to take more advanced courses in mathematics and may be taken in any order, but may not be taken for credit after MSM 201 or 211.
Fall, 3 credits

MSM 112 Introductory Mathematics II

A course designed to acquaint the student with the flavor of mathematics, what mathematics is and what modern mathematicians do, through consideration of specific topics chosen from: the limit concept—area, length, rates of change; combinatorial topology; geometric structures. MSM 111 and MSM 112 may be taken in any order, but may not be taken for credit after MSM 201 or 211.
Spring, 3 credits

MSM 121 Calculus I

The derivative and integral: fundamental properties, interpretations, and computations for elementary functions. Introduction to techniques of integration.
Fall and Spring, 4 credits

MSM 122 Calculus II

Integration techniques. Selected applications of the derivative and integral. First order differential equations. Taylor's formula. Infinite series. Introduction to partial derivatives and multiple integrals.
Prerequisite: MSM 121 or MSM 191. May not be taken for credit in addition to MSM 123.
Fall and Spring, 4 credits

MSM 123 Calculus II and Probability

Taylor's formula with remainder. Partial derivatives. Multiple integrals. Continuous and discrete probability: density; expectation; binomial. Poisson, uniform, exponential and normal distributions; moment generating functions; Poisson and normal approximation to binomial distribution; central limit theorems. This course is designed for social science majors and those students who do not expect to take the two-year calculus sequence. May not be taken for credit in addition to MSM 122.
Prerequisite: MSM 121 or MSM 191.
Fall and Spring, 4 credits

MSM 131 Elementary Number Theory

A careful, but elementary, study of the properties of the integers: mathematical induction, the division algorithm, congruences, prime numbers, quadratic residues,

sums of squares. This course may not be taken for credit after MSM 211 or MSM 221.
Fall, 3 credits

MSM 132 Elementary Geometry and Group Theory

Groups of transformations associated with geometry: reflections, translations, rotations, isometries, etc. An introduction to groups and their applications to Euclidean, hyperbolic, elliptic, and/or projective geometry. This course may not be taken for credit after MSM 211.
Prerequisite: MSM 121 or MSM 191.
Spring, 3 credits

MSM 151 Calculus III

Introduction to linear algebra and to ordinary differential equations: vector spaces, subspaces, linear independence, bases, dimension, linear transformations and matrices; theory and techniques for the solution of linear differential equations and linear systems, including power series and power series solutions.
Prerequisite: MSM 122 or MSM 123.
Fall and Spring, 3 credits

MSM 152 Calculus IV

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

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 151.
Spring, 4 credits

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 prerequisites 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

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: MSM 151.
Fall and Spring, 3 credits

MSM 202 Analysis II

Calculus of several variables: inverse and implicit function theorems, differential forms, submanifolds of n-space, Stokes' theorem.
Prerequisites: MSM 152 and MSM 201.
Fall and Spring, 3 credits

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

(See description under Interdepartmental Courses in Mathematical Sciences.)

MSM 211 Algebra I

Basic concepts in abstract algebra: groups and rings together with their homomorphisms and quotient structures. Integral domains, unique factorization domains, and principal ideal domains. Fields and polynomial domains over fields.
Prerequisite: MSM 151 or MSM 192.
Fall and Spring, 3 credits

MSM 212 Algebra II

Structure theory of finitely generated modules over principal ideal domains. Applications to group theory and to linear algebra. Further topics such as homological algebra, field theory, structure of rings.

Prerequisite: MSM 211.
Fall and Spring, 3 credits

MSM 213 Theory of Polynomials

Detailed study of polynomials, including elementary Galois theory with emphasis on quadratic, cubic, and quintic equations. Further topics such as real fields, Sturm's theorem.
Prerequisite: MSM 211.
Fall and Spring, 3 credits

MSM 216 Linear Algebra

Vector spaces over fields, linear transformations, the orthogonal and unitary groups, canonical forms for matrices, the spectral theorem, multilinear algebra.
Prerequisite: MSM 151 or MSM 192.
Fall and Spring, 3 credits

MSM 221 Number Theory

Congruences, quadratic residues, quadratic forms, continued fractions, Diophantine equations, number-theoretical functions, and properties of the prime numbers.
Prerequisite: MSM 151 or MSM 192.
Fall, 3 credits

[MSI 237, 238 Foundations of Secondary School Mathematics I, II]

(See description under Interdepartmental Courses in Mathematical Sciences.)

MSM 239 Mathematics Teaching Seminar

Discussion of curricula, resources, methods, and problems relating to the secondary school mathematics teacher. Required of student teachers in mathematics. Not open to others.
Corequisites: EDU 350, EDU 354.
Fall and Spring, 1 credit

MSM 240 Geometry of Space Curves

Differential geometry of curves in the plane and in n-space. Winding number, Jordan curve theorem, Borsuk-Ulam theorem, 4-vertex theorem, isoperimetric inequality, curvature of a knot.
Prerequisite: MSM 152 or MSM 154 or MSM 192.
Fall, 3 credits

MSM 241 Geometric Structures

Formal geometries, their relationship and interpretations; projective, affine, Euclidean and non-Euclidean geometries.
Prerequisite: MSM 211.
Spring, 3 credits

MSM 261 History of Mathematics

A study of the development of mathematics from the Greeks up through the development of calculus. Special attention will be devoted to the origins of calculus and to the contributions of 19th century mathematicians who put it on a firm foundation. This course may not be counted toward major requirements in the Division of Mathematical Sciences, nevertheless, majors in the division are encouraged to take it.
Prerequisite: MSM 122 or MSM 191.
Spring, 3 credits

MSM 291, 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 term 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.
Fall and Spring, 3 credits each semester

MSM 301 Introduction to Complex Analysis

Holomorphic functions. Cauchy-Riemann equations. Cauchy theory. Maximum modulus principle. Taylor series expansions. Differential forms. Meromorphic functions. Laurent series expansions. Evaluation of integrals by the method of residues. Topics chosen from: harmonic functions, Dirichlet problem for the disc, Hilbert transforms.
Prerequisite: MSM 201 or MSM 193.
Fall and Spring, 3 credits

MSM 302 Introduction to Real Analysis

Lebesgue and Lebesgue-Stieltjes measures and integrals and their fundamental properties. Comparison with Riemann integration. Basic properties of L_2.

Prerequisite: MSM 202 or MSM 194.
Spring, 3 credits

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 Poincaré small parameter method, the Bogoliubov-Krylov-Mitropolsky asymptotic method, the method of averaging, and the method of Andronov and Witt. Oscillations of nonlinear systems with slowly varying parameters, forced oscillations, subharmonic oscillations and entrainment, bifurcation of solutions, Hamiltonian systems, small denominators.
Prerequisites: MSI 201 and either MSI 202 or MSM 301.
Fall and Spring, 3 credits each semester

MSM 305, 306 Partial Differential Equations

Fourier series, orthogonal functions, 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.
Prerequisites: MSI 201, MSI 202 or MSM 301, and PHY 102; or permission of instructor.
Fall and Spring, 3 credits each semester

MSM 312 Introduction to Topology

Introduction to point set topology: connectedness, compactness, continuity, etc. The fundamental group and covering spaces.
Prerequisites: Either MSM 201 or MSM 193, and MSM 211.
Fall and Spring, 3 credits

MSM 323 Introduction to Differential Geometry

Geometry of surfaces in 3-space. Introduction to manifolds and to Riemannian geometry.
Prerequisite: MSM 202 or MSM 194.
Fall and Spring, 3 credits

MSM 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

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

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

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

MSI 201 Advanced Calculus for Scientists I

Ordinary differential equations; integration by power series; Bessel and Legendre functions. Expansion in series of orthogonal functions, including Fourier series. Introduction to partial differential equations of mathematical physics. Laplace's equation. Calculus of variations.
Prerequisite: MSM 152 or MSM 192.
Fall and Spring, 3 credits

MSI 202 Advanced Calculus for Scientists II

Functions of a complex variable; calculus of residues, conformal mappings. Dirichlet problem. Review of orthogonal curvilinear coordinates. The divergence theorem. Solutions of classical partial differential equations of mathematical physics including applications of conformal mappings and the Laplace transform.

Prerequisite: MSI 201.
Fall and Spring, 3 credits

MSI 237, 238 Foundations of Secondary School Mathematics I, II

(Formerly MSM 237, 238)

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

DEPARTMENT OF MUSIC

Professors: AREL, [a]LAYTON, LESSARD, LEWIN, NEMIROFF, [b]ROSEN

Associate Professors: BARON, BONVALOT

Assistant Professors: EKWUEME, FULLER, LAWTON, WINKLER, ZUKOFSKY

Instructors: KRAMER, [a]L. STARR, WOLF

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 de-

[a] On leave academic year 1972-73.
[b] On leave fall semester 1972.

partment 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 advisor. 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 his first year as a music major. A student who has not passed his proficiency test by the end of his 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

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

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

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

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

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

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

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

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.
3 credits. Not offered 1972-73.

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.
3 credits. Not offered 1972-73.

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.
Fall, 3 credits

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

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.
Prerequisite: Auditions.
Fall and Spring, 1 credit

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

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

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

MUS 125 Modal Counterpoint I

Counterpoint in 16th century style for two voices.
Prerequisite or corequisite: MUS 122.
Fall and Spring, 3 credits

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

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

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

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

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

MUS 161 to 199 Secondary Instrument of 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.
Prerequisite: Permission of instructor.
Fall and Spring, 2 credits

MUS 161 Piano
MUS 167 Violin
MUS 168 Viola
MUS 169 Cello
MUS 170 String Bass
MUS 174 Flute
MUS 175 Oboe
MUS 176 Clarinet
MUS 177 Bassoon
MUS 183 Horn
MUS 184 Trumpet
MUS 185 Trombone
MUS 186 Tuba
MUS 191 Percussion
MUS 199 Voice

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

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

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 1972-73.

MUS 211 Modal Counterpoint II

Counterpoint in 16th century style for three or more voices.
Prerequisite: MUS 125.
Spring, 3 credits

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.
3 credits. Not offered 1972-73.

MUS 215 Advanced Harmony

Techniques and practices beyond those studied in MUS 127, 128.
Prerequisite: MUS 128.
3 credits. Not offered 1972-73.

MUS 219 Beginning Composition

Individual projects in composition, discussed and criticized in class. Enrollment limited to eight.
Prerequisite: Permission of instructor.
3 credits. Not offered 1972-73.

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

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

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.
Prerequisite: Permission of instructor.
Fall and Spring, 4 credits

MUS 261 Piano
MUS 267 Violin
MUS 268 Viola
MUS 269 Cello
MUS 270 String Bass
MUS 274 Flute
MUS 275 Oboe
MUS 276 Clarinet
MUS 277 Bassoon
MUS 283 Horn
MUS 284 Trumpet
MUS 285 Trombone
MUS 286 Tuba
MUS 291 Percussion
MUS 299 Voice

MUS 301 Homophonic Forms

Composition in Classical and Romantic styles, proceeding from individual phrases to large movements.
Prerequisite: MUS 128.
3 credits. Not offered 1972-73.

MUS 303 Fugue

Application of the skills of tonal counterpoint to fugal composition.
Prerequisite: MUS 213.
3 credits. Not offered 1972-73.

MUS 305 Orchestration

The possibilities and limitations of the commonly used instruments. Conventions of notation. Practice in scoring for various ensembles.
Prerequisite: MUS 128.
Fall, 3 credits

MUS 313 Composition

Open only to students demonstrating sufficient aptitude and capacity for original work.
Prerequisite: Permission of instructor.
Fall and Spring, 3 credits

MUS 315 University Orchestra (Advanced)

Study and performance of works from the repertory of the concert orchestra. Includes opportunities for chamber and solo work within the organization.
Corequisite: MUS 261-299 Primary Instrument.
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

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

MUS 319 Chamber Music

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 Piano Literature I

Performance and analysis of representative works for the solo keyboard repertory beginning with the English virginal school and continuing through the piano music of the Classical period. Intended for advanced students of piano enrolled in MUS 261.
Prerequisite: Permission of instructor.
Fall, 2 credits

MUS 322 Piano Literature II

Performance and analysis of solo piano music from 1800 through the mid-20th century. Intended for advanced students of piano enrolled in MUS 261.
Prerequisite: Permission of instructor.
Spring, 2 credits

MUS 323, 324 Violin Repertory I, II

A weekly forum for student performances of pertinent repertory from c. 1700 to c. 1940. For advanced violinists enrolled in MUS 267 or MUS 571.
Prerequisite: Permission of instructor.
Fall (323) and Spring (324), 2 credits each semester

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.
3 credits. Not offered 1972-73.

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 1972-73.

MUS 347 Johann Sebastian Bach

A study of selected vocal and instrumental works.
Prerequisites: MUS 128, 144.
3 credits. Not offered 1972-73.

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.
Fall, 3 credits

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.
Spring, 3 credits

MUS 351 Beethoven

Works of differing scope and medium drawn from every period of his life will be studied.
Prerequisites: MUS 128, 144.
3 credits. Not offered 1972-73.

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.
Fall, 3 credits

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.
3 credits. Not offered 1972-73.

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.
Fall, 3 credits

MUS 361 Piano Music of the 19th Century

The repertory of the solo instrument from Beethoven to Debussy.
Prerequisites: MUS 128, 249.
3 credits. Not offered 1972-73.

MUS 363 Stravinsky

The changing stylistic manners adopted by a pivotal composer of the 20th century.
Prerequisites: MUS 128, 249.
3 credits. Not offered 1972-73.

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

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.
3 credits. Not offered 1972-73.

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 1972-73.

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.
3 credits. Not offered 1972-73.

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

DEPARTMENT OF PHILOSOPHY

Distinguished Professor: BUCHLER

Professors: GELBER, HEELAN *(Chairman)*, [a]IHDE, RADNITSKY *(Visiting)*, STERNFELD, [b]ZANER, ZYSKIND

Associate Professors: DILWORTH, SLOTE, SPECTOR, [b]TEJERA, WATSON, [c]ZEMACH

Assistant Professors: BONJOUR, DE NICOLAS, ERWIN, HILL, HOWARD

Instructors: ALLISON, BENFIELD

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:

Credits

A. Study within the area of the major

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

[a] On leave fall semester 1972.
[b] On leave spring semester 1973.
[c] On leave academic year 1972-73.

Category II. Two courses defined in terms of topics or skills basic to all disciplines and common to various philosophic styles.	6
Category III. One course defined in terms of a particular style, approach, movement, or tradition.	3
Category IV. Two courses relating philosophy to particular disciplines.	6
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 courses of at least 3.5. To seek honors, a student must plan a program not later than the registration period of the senior year which meets with the approval of a department advisor. The program shall consist of three courses at the 300 level or higher, concentrated on related aspects of a central problem, and leading to a senior paper which will become the focus of an oral examination. Honors will be awarded upon passage of the examination.

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)

(Formerly PHI 113)
Readings and discussions on three topics concerning man: man's identity; man's understanding; man's values.
Fall and Spring, 3 credits

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

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.
Schedule to be announced, 3 credits

PHI 103 Philosophic Problems (II)

Introductory inquiry into one or more of the basic problems of philosophy.
Fall and Spring, 3 credits

PHI 104 Contemporary Morality (IV)

A philosophical 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

PHI 106 Radical Thought (IV)

A systematic, historical, and critical introduction to Marxism as a political theory, and as a theory of action. Course concentrates on Marx's work and on its relation to other Marxists (e.g., Lenin, Trotsky, Luxemburg, Mao) and to the New Left.
Fall and Spring, 3 credits

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 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

PHI 110 Historical Introduction to Philosophy (I)

An introductory study of the nature of philosophy through an analysis of philosophic activity in the context of its socio-historical setting. In order to heighten awareness of the nature of the activity, pairs of philosophers will be studied in each of the major periods of the history of philosophy. The course will focus on such thinkers as Plato and Aristotle, Descartes and Hobbes, Marx and Kierkegaard.
Schedule to be announced, 3 credits

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

PHI 118 The Uses of Philosophy (IV)

Introductory study of the bearing of philosophic considerations on the special arts and sciences.
Schedule to be announced, 3 credits

PHI 141 Concepts of Equality (IV)

The course examines concepts of equality that have developed as social ideals in the modern world. It pays special attention to current efforts in this country to provide equal protection of the laws to racial, religious, sexual, and economic minorities. It analyzes the values and theories upon which egalitarian ideals rest.
Spring, 3 credits

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

Intermediate Level Courses

PHI 200 History of Ancient Philosophy (I)

Study of the major thinkers from Thales to Aristotle.
Fall, 3 credits

PHI 201 Hellenistic and Roman Philosophy (I)

Study of representative writings of Stoicism, Epicureanism, Skepticism and Neo-Platonism.
Fall, 3 credits

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.
3 credits. Not offered 1972-73.

PHI 204 History of Medieval Philosophy (I)

Study of the writings of major thinkers from Augustine to William of Ockham.
Spring, 3 credits

PHI 206 History of Modern Philosophy (I)

Study of the writings of major thinkers from Descartes to Kant.
Spring, 3 credits

PHI 208 History of 19th Century Philosophy (I)

Study of major representative figures of the 19th century such as: Hegel, Schopenhauer, Marx, Mill, Nietzsche, Kierkegaard, Spencer, and Comte.
Prerequisite: Sophomore standing and/or one course in philosophy.
Spring, 3 credits

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

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

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

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.
Schedule to be announced, 3 credits

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, Nietzsche, Bergson, and Unamuno.
Prerequisite: Sophomore standing.
Spring, 3 credits

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

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

PHI 218, 219 Innovation and Tradition (II)

An introductory inquiry into how man shapes his thought and action to discover and cope with new problems. Topics include: the break with tradition; the making of facts; self-expression as a source of novelty; patterns of discovery and invention; problems of stability and continuity in the face of innovation. Readings are drawn from such sources as the following: Aristotle, *Rhetoric;* Lincoln-Douglas Debate; Socrates' *Apology;* Ghiselin, *The Creative Process;* T. S. Kuhn, "The Essential Tension: Tradition and Innovation."
Prerequisite: Sophomore standing.
Schedule to be announced, 3 credits each semester

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, Neitzsche, Berdyaev, Collingwood, and Randall.
Prerequisites: Two semesters of social science and one course in philosophy.
Schedule to be announced, 3 credits

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.
Schedule to be announced, 3 credits

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.
Spring 3 credits

PHI 228 Philosophy of Religion (IV)

An inquiry into the function of philosophic principles in religious thought. The course examines basic philosophic structures for such thought. It makes use of readings drawn from such writers as Augustine, Hume, Kant, Whitehead, and Buber.
Prerequisite: Sophomore standing
Fall, 3 credits

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.
Schedule to be announced, 3 credits.

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.
Fall, 3 credits. Not offered 1972-73.

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.
Fall, 3 credits

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

PHI 237 Theories of Knowledge (II)

This course consists of a study of a varety 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.
Prerequistie: PHI 101, 102, or 103.
Schedule to be announced, 3 credits

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

PHI 239 Chinese and Japanese Buddhism (III)

The course will trace the main philosophical and institutional stages of Chinese and Japanese Buddhism, with emphasis on the latter. Topics: the transmission of Indian Mahayana Buddhism to China; the formation of such Chinese schools as T'ien-t'ai, Hua-yen, Pure Land, and Ch'an (Zen); the further transmission of such schools to Japan, their assimilation within, and formative influence on, Japanese culture. Japanese schools treated: Teudai, Shingon, Pure Land, Nichiren (Lotus), and Zen.
Prerequisite: Sophomore standing and/or one course in philosophy.
Fall, 3 credits

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

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

PHI 251 Analytic 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.
Schedule to be announced, 3 credits

PHI 252 Ethical Inquiry (IV)

An investigation of selected ethical problems.
Prerequisites: Sophomore standing and one course in philosophy.
Fall, 3 credits

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

PHI 274 Metaphysics of Literary Art (IV)

Philosophic considerations relevant to inquiry concerning the nature of poetry, literary meaning and perspective, the relation between literature and "reality," and the foundations of criticism.
Prerequisites: Sophomore standing and one course in philosophy.
Schedule to be announced, 3 credits

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

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

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

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.
Schedule to be announced, 3 credits

PHI 303 The Surrounding World: Philosophy and Environment (IV)

A philosophical study of the impact of science and technology upon man and his relations with the environment with a focus upon alternative systems, values and possibilities, open and closed models of nature, and changes within man's conception of himself.
Prerequisites: One course in social science and one course in natural science.
Fall, 3 credits

PHI 304 Modern Japanese Philosophy and Literature (III)

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 305 East and West: A Comparative Philosophical Inquiry (III)

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.
Prerequisites: One course from among PHI 210, 211, 212, 238, 239, 304, and 318 and one other course in philosophy.
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.
Schedule to be announced, 3 credits

PHI 311 Contemporary Philosophies of Language (II)

A discussion of current topics in the philosophy of language.
Prerequisite: One course in philosophy.
Spring, 3 credits

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

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

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. Not offered 1972-73.

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

PHI 317 Philosophy of Myth (IV)

Studies in myth are undertaken in a wide range of disciplines, from literature to anthropology to philosophy. This course will examine the structural forms of myth, the relation of myth to language, and the role of myth in social and self-interpretation. In addition to the central emphasis upon a philosophy of myth, occasional lectures will be given by experts in other areas.
Prerequisites: Any combination of at least two courses in classics, anthropology, literature, psychology, sociology, or religious studies plus at least one course in philosophy.
Fall, 3 credits

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

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

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

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 level physics.
Schedule to be announced, 3 credits

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, Russell. Lewis, Ayer, Austin, and others.
Prerequisites: Nine hours of philosophy, including PHI 161 and PHI 206.
3 credits. Not offered 1972-73.

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

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.
Schedule to be announced, 3 credits

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, 3 credits

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' capacity 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

PHI 397 Readings and Research in Methodology (Normally III)

Advanced level inquiry with individualized instruction in one particular philosophical style of reasoning. Consult undergraduate advisor for specific details.
Prerequisites: Senior philosophy major standing and permission of department.
Fall and Spring, 1 to 6 credits

PHI 398 Readings and Research in the Uses of Philosophy (Normally IV)

Advanced level inquiry with individualized instruction in the application of philosophical tools to one of the special disciplines. Consult undergraduate advisor for specific details.
Prerequisites: Senior philosophy major standing and permission of department.
Fall and Spring, 1 to 6 credits

PHI 399 Readings and Research in the History of Philosophy (Normally V)

Advanced level inquiry with individualized instruction in the great philosophies of the past. Consult undergraduate advisor for specific details.
Prerequisites: Senior philosophy major standing and permission of department.
Fall and Spring, 1 to 6 credits

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: L. THOMPSON *(Chairman)*, VON MECHOW, RAMSEY *(Director, Men's Division)*

Assistant Professors: DESCH *(Acting Director, Women's Division)*, K. LEE, SMOLIAK

Instructors: COVELESKI, DUDZICK, DUQUIN, HIGASHI *(Part-time)*, HUTTON, IVERSON, LUKEMIRE *(Part-time)*, MORI *(Part-time)*, E. SIEGEL *(Part-time)*, SNIDER, VAN WART *(Part-time)*, WEEDEN

Physical Education Requirement

The physical education requirement states that each undergraduate student of the University must satisfactorily complete one year (two semesters) of physical education courses. This requirement can be fulfilled during any two semesters chosen by the student but usually by the end of the sophomore year. The physical education requirement can also be fulfilled, in whole or in part, by a student's participation in intercollegiate athletics.

Each student must earn a minimum of 100 points to satisfy the University's physical education requirement. All successfully completed physical education classes are awarded 50 points per semester.

To receive credit for a semester of physical education, a course will have to be passed, but no credit is to be received nor grades given other than Pass or No Credit. The Pass or No Credit grade is determined by evaluating the student's attendance and attitude during the semester.

Any student participating in an intercollegiate sport will be awarded points based on attitude and attendance during practice and games; and the equating of time in relation to courses offered.

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, deck tennis, fencing (basic), field hockey, golf, gymnastics, handball, karate, paddle-ball, physical conditioning, soccer, softball, speedball, squash, table tennis, tennis, touch football, track and field, volleyball, weightlifting, trampolining, and tumbling.

PEM, PEW 100 Tennis/Badminton
PEM, PEW 101 Squash/Badminton
PEM, PEW 102 Volleyball/Badminton
PEM 103 Handball/Squash
PEW 103 Badminton/Archery
PEM 104 Paddleball/Squash
PEW 104 Golf/Squash
PEM 105 Physical Conditioning
PEW 105 Tennis/Archery
PEW 106 Volleyball/Archery
PEC 106 Basic Karate
PEC 107 Intermediate Karate
PEM 110 Golf/Squash
PEM 111 Squash/Tennis
PEM 112 Volleyball/Golf
PEM 113 Volleyball/Archery
PEC 113 Basic Fencing
PEM 114 Volleyball/Tennis
PEC 114 Badminton/Tennis
PEW 115 Tennis/Volleyball
PEC 115 Archery/Badminton
PEM 116 Badminton/Squash/Paddleball
PEM 117 Squash/Handball/Paddleball
PEM, PEW 118 Golf/Badminton
PEM 119 Touch Football/Volleyball
PEM, PEW 142 Basketball/Softball
PEM, PEW 143 Volleyball/Softball
PEM 144 Soccer/Volleyball
PEW 144 Field Hockey/Volleyball
PEM 145 Touch Football/Basketball
PEM 146 Basketball/Track and Field

PEC 104 Physical Education in the Elementary School

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 106 Weight Training

A basic course in weight training using aerobic and anaerobic activities to improve physical strength, appearance, and range of movement through the use of various types of weight training equipment and individualized counseling.

PEM, PEW 107 Self-Defense

Separate courses for men and women in the instruction and practice of basic self-defense techniques of judo, aikido, and jujitsu. PEW 107 is adapted to the special needs and capacities of young women.

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.

PEM 109 Weightlifting

A basic course in the techniques and fundamentals of weightlifting, exercises for specific muscle groups, and development of personal work-out schedules.

PEC 110 Horseback Riding (Equitation)

This course is designed to equip students at the beginner and intermediate 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 $35 is necessary for enrollment.

PEC 111 Golf/Bowling

This course is designed for students interested in recreational activities. Class sections meet once a week for a double period (2½ hours). A special fee of $25 is necessary for enrollment in this course.

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 116 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.

PEM, PEW 120 Basic Swimming

Separate courses for men and women designed to equip students at the non-swimmer and beginner levels with basic swimming skills and knowledge.

PEM, PEW 121 Intermediate Swimming

Separate courses for men and women 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.

PEM 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.

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.

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.

PEC 130 Beginning Modern Dance

A study of the fundamentals of modern dance, including an analysis of movement, conditioning techniques, and simple compositional forms.

PEW 133 Movement Fundamentals

A basic course designed to orient students with all phases of movement. Course will include the role of exercise, weight control, balance, relaxation, locomotor skills, rhythmic skills, play skills, and work skills.

PEC 133 Folk and Social Dance

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

PEC 134 Intermediate Modern Dance

Development of modern dance techniques and movement awareness.
Prerequisite: PEC 130 or permission of instructor.

PEC 135 Dance Teaching Methods for Elementary School Teachers

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.

PEC 136 Archery

A comprehensive course in the history, nomenclature of equipment, basic rules, and fundamental skills of archery for men and women.

PEC 137 Tennis

A comprehensive course in the basic rules, fundamentals, and playing strategy in the sport of tennis for men and women.

PEC 138 Advanced Modern Dance

Modern dance techniques on an advanced level, including work in dance composition.
Prerequisite: PEC 130 or permission of instructor.

PEC 139 Tumbling and Trampolining

Basic through intermediate tumbling and trampolining, including dual stunts, balancing, and pyramid building for men and women.

PEW 140 Basic Gymnastics

A basic course covering the four olympic pieces: free exercise, uneven parallel bar, horse and balance beam.
Fall

PEW 141 Intermediate Gymnastics

An intermediate course covering the four olympic pieces, including adaptation of techniques in compositional performances.
Spring

DEPARTMENT OF PHYSICS

Professors: O. AMES *(Chairman)*, ARIMA, BALAZS, BLUME, G. E. BROWN, CHIU, COURANT, DRESDEN, EISENBUD, FEINGOLD *(Director of Graduate Program)*, FINOCCHIARO, D. FOX, M. GOLDHABER *(Adjunct)*, M. L. GOOD, KAHN *(Director of Undergraduate Program)*, KAO, LAMBE, B. W. LEE, L. L. LEE, MUETHER, NATHANS, POND, SILSBEE, STRASSENBURG, SWARTZ, TOLL, WEISBERGER, WILCOX, C. N. YANG *(Einstein Professor)*

Associate Professors: BLIEDEN, DEZAFRA, FOSSAN, FREEDMAN, GRANNIS, JACKSON, KIRZ, KUO, LEE-FRANZINI, MOULD, PAUL, STROM

Assistant Professors: ALLEN, FEIBELMAN, A. GOLDHABER, GRAF, LUKENS, MCCOY, MCGRATH, METCALF, NIEH, PALDY, QUIGG, RISKA *(Visiting)*, J. SMITH, SPROUSE, J-M. WANG

Lecturer: BLEDSOE

A student wishing to major in physics may elect either the research degree program, the general degree program, or an appropriate combination of the two. The *research degree 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 degree program.

The *general degree 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 degree 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 advisor.

A student wishing to major in physics must, at the end of his sophomore year, consult with his departmental advisor in order to draw up a preliminary plan of study which will then be submitted to the department. The plan can be revised at any time with the advisor's approval.

Honors

To receive the Bachelor of Science in physics with honors, a student must take ten courses in the department at the junior level or above, re-

ceiving 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 advisor.

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
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 206 Thermodynamics, Kinetic Theory, Statistical Mechanics
PHY 208 Quantum Physics
At least one semester of Junior Lab (PHY 235, 236)
MSI 201* Advanced Calculus for Scientists I
MSI 202** Advanced Calculus for Scientists II

Senior Year

PHY 343 Methods of Mathematical Physics I
PHY 345 Senior Laboratory I
Two selections from courses listed below:

PHY 305 Advanced Quantum Physics
PHY 331 Nuclear and Particle Physics
PHY 336 Topics in Electrodynamics

* Prerequisite for PHY 208, 336 and 343; corequisite for PHY 205.
** Corequisite for PHY 208; prerequisite for PHY 343.

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
ESS/PHY 381 Astrophysical Processes I
ESS/PHY 382 Astrophysical Processes II
ESS/PHY 383 Physics of the Interstellar Medium
ESS/PHY 384 Galactic Structure

The General Degree Program

A student electing this track is free to choose from many possible courses depending on his interests and goals. The following sample program is recommended. Other choices are acceptable with the advisor'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

Twelve credits of other sciences, mathematics, or science-related courses meeting the approval of the department. PHY 239 may be counted toward these 12 credits; it may not be included as one of the ten departmental courses required for the degree.

Those wishing to transfer from this sequence to the program designed as preparation for graduate study should take PHY 152 following PHY 142.

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 would take a concentration in those courses offered by the Earth and Space Sciences or Physics Department which satisfies his educational goals. Those seeking to pursue a graduate or research career are strongly advised to take ESS 242 and ESS 244, and ESS/PHY 381, ESS/PHY 382, ESS/PHY 383, and ESS/PHY 384 in partial fulfillment of the course requirements for the bachelors degree.

Certification for Secondary-Level Teaching

The four one-year courses in physics and the senior seminar of the general degree program represent 32 credits. Four additional credits in any science and also 12 credits in the professional study of education and a college supervised student-teaching experience are required to obtain

state certification as a high school teacher of physics. PHY 239 may be counted toward these 12 credits, and is strongly recommended to all prospective high school and two-year college physics teachers. With six hours in mathematics in addition to those required above, it is possible to obtain dual certification in physics and mathematics. Dual certification in physics and earth sciences or in physics and chemistry is feasible within the boundaries of the general degree program.

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 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

Experimental investigations into the mechanical, electrical, and thermal properties of solid matter. The concepts of force, motion, temperature, energy, interference, and diffraction of waves, electric charge, atoms, molecules, crystals, symmetry, and randomness are introduced and discussed. Students are encouraged to formulate and test particle models of matter. Careful observation and logical reasoning are stressed. The relationship between atomic structure and observable properties will be developed for a few representative materials. This course provides an opportunity for students with limited backgrounds in science and mathematics to engage in a serious study of a limited range of physical phenomena using a laboratory-oriented approach. The laboratory work and problem solving can be completed successfully without special talent in experimental technique or 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 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. Instead of problem-solving, the basic knowledge of ideas, phenomena, and vocabulary of physical science presented will be applied to understanding the natural universe as well as the modern devices of the man-made world. Topics will include atomic and astronomical measurement, perception, computers, and medical instrumentation. Reading will be from popular science paperbacks and *Scientific American*.
Fall, 3 credits

PHY 141, 142 Topics in Intermediate Physics

This course contains a selection of topics chosen from diverse areas of physics with an emphasis placed on direct application to physical phenomena. The primary goal is to make the student conversant with these phenomena with an inclination toward experimental investigation, rather than through deductive or problem-solving techniques. Topics will include scattering, gravitation, oscillatory motion, kinetic theory, geometrical and physical optics, wave motion, and elements of atomic and nuclear structure. The laboratory will be "open ended" and will stress independent investigation. Three class meetings and one laboratory each 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 and Spring, 4 credits each semester

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, 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.
Spring, 4 credits

PHY 175, 176 Concepts, Methods, and Significance of Physical Science

A course for students with philosophical, literary, or humanistic interests in physical science. The structures of the major theories of physics are investigated and analyzed. In relation to each theory the mode of its development, its limitations, its relation to the total structure of physics, its philosophical and pseudo-philosophical implications and its technological and social consequences are studied. Three instructional hours per week.
Prerequisite: Sophomore standing or above.
Fall and Spring, 3 credits each semester

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, 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, 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.
Spring, 3 credits

PHY 207 Celestial Mechanics

An intermediate course in mechanics focused on astronomical applications. Topics to be covered include: review and further development of basic Newtonian mechanics; central forces and gravitational potential theory; the two-body problem with applications to planetary orbits and double star systems; the determination of orbits from observational data; the three-body problem; satelite of multiple stellar systems; and motion of artificial satellites. Three class hours per week.
Prerequisites: PHY 101, 121, or 131, 132; and MSM 122.
Fall, 3 credits. Not offered 1972-73.

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 dimensional solutions including the treatment of angular momentum and spin, and perturbation theory. Applications to simple systems, especially the hydrogen atom, will be stressed. Three class hours per week.
Prerequisites: PHY 203, PHY 205, MSI 201.
Fall and Spring, 3 credits

PHY 210 Energy Resources and the Environment

An investigation of the role of energy in our civilization showing interaction of pure science, applied science, and technology and their impact on the environment and everyday life. Discussion centers on current status of energy resources and physical principles of energy conversion. These principles are illustrated by examining some present (e.g., fission reactors) and future (e.g., magneto-hydrodynamic generators) energy conversion systems. The environmental impact of the present rate of energy consumption of our society is dis-

cussed. 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 equivalent.
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, 242 Topics in Modern and Quantum Physics

Primarily for those in the general degree program. A study of those developments in physics that lead beyond classical mechanics. Special relativity, an introduction to quantum mechanics, and the study of atomic structure and spectra are covered. Radioactivity, nuclear structure, modern theory of solids, plasma physics and high energy elementary particle physics will be discussed briefly. The quantum and relativistic viewpoints are stressed throughout. Three class hours per week.
Prerequisites: PHY 141, 142, or permission of the director of the undergraduate program in physics.
Fall and Spring, 3 credits each semester

PHY 301, 302 Contemporary Physics from an Elementary Viewpoint

The basic purpose of this course is to provide a qualitative understanding of the ideas, methods, and experimentation of contemporary physics. Extensive use will be made of dimensional arguments, order of magnitude estimates, and pictorial descriptions. The subjects to be discussed will be chosen from super-conductivity, masers, Mossbauer effect, strong and weak interactions, quasars, and turbulence. This course is intended primarily for students in the general degree 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. Speakers will include a number of physicists, mathematicians, and engineers now working in these areas. Subjects to be discussed are solid waste and water resource management, fire and police protection, transportation, health delivery systems, and nuclear safeguards. In addition to attending the 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 and Spring, 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 transi-

tions, 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 degree 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.
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 347 Senior Seminar on the Design of Experiments in Physics

The course will cover analysis of experiments in physics, including problems of planning, execution, and interpretation. Examples will be drawn from nuclear, high energy, and classical physics. Various experimental techniques will be discussed, and some treatment of statistical errors will be given. The course will be tailored to some extent to the tastes of the students.
Spring, 3 credits. Not offered 1972-73.

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 381, 382, 383, 384 are identical with ESS 381, 382, 383, 384. See Department of Earth and Space Sciences for course descriptions.

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

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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: PESONEN, SCARROW, TANENHAUS, TRAVIS, TURSKY, WILDENMANN, J. C. WILLIAMS *(Chairman)*

Associate Professors: LODGE, MYERS

Assistant Professors: CIMBALA, [a]FRIEDLAND, GROFMAN, [b]JACKNIS, [a]MULLER, MUNK, POOL

Adjunct Professors: DOGAN, EL-AYOUTY, KOPPELMAN, KOTTLER, REICHLER

Lecturer: NEWHOUSE

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.

COURSES IN POLITICAL SCIENCE

POL 109 Political Man

This course focuses on the nature of men committed to public affairs and on their careers. Class will be devoted to watching and discussing taped or live, in-depth interviews with political leaders in this country and abroad. In the interviews, political leaders will reflect on their careers, their work and role as they see it, and on the nature of political leadership. The readings will consist of biographies and autobiographies of past political leaders.
Spring, 3 credits

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

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[a] On leave academic year 1972-73.
[b] On leave fall semester 1972.

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.
Fall and Spring, 3 credits

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.
Fall, 3 credits

POL 140 Introduction to American Government

This course will cover what the informed citizen and specialist should know about the organization of American government, including the Constitution and what it means today, the Congress, political parties, pressure groups, growth of the Presidency, the Supreme Court, judicial review, federalism, separation of powers, the Bill of Rights.
3 credits

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.
3 credits

POL 190 Political Cinema: Ideology and Propaganda

The general purposes of this course are: to discover the ideology in the "agitational," "polemical," and "didactic" film as well as in films with simply political themes and characters; and to generalize on the nature of the appeals of these films.
Prerequisite: Sophomore standing.
3 credits

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. Laboratory periods are devoted to formulating and seeking answers through analysis of data from a number of contemporary political systems.
Fall and Spring, 4 credits

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 all majors.
Fall and Spring, 3 credits

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

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

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

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

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

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

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

POL 211 Comparative Political Parties and Pressure Groups

An analysis of the nature and function of political parties and pressure groups, with emphasis upon non-American political systems, both western and non-western, and upon party history, electoral behavior, election campaigns and pressure group activity. Analysis of cross-national public opinion survey data using card sorter.
3 credits

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

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

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

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

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

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

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

POL 223 Latin America and the United States

Survey of the international relations of the Latin American republics; formulation of Latin American policy; relations with the United States and Europe; relations with international organizations (U.N. and O.A.S.); international trade; economic and financial development.
3 credits

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

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

POL 227 Peace and War

Political issues in war and human conflict are considered in terms of diverse philosophical assumptions about the nature of man, the state, and international relations. The effects of war on man and society are evaluated in the context of more general political, social, and moral questions.
3 credits

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

POL 230 American Constitutional Law

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.
3 credits

POL 232 Comparative Judicial Processes

The role of courts, lawyers, judges, and interest groups in the American and selected foreign political systems.
3 credits

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.
Prerequisite: POL 200 or permission of instructor.
3 credits

POL 234 Comparative Political Analysis

This course brings together the analytical concepts and the methodological techniques that are associated with comparative political analysis, both at the cross-national level and the level of cross-subunit comparison. Examples are drawn from representative writings, with the emphasis placed upon identifying conceptual problems and the limitations of various methodologies.
Prerequisites: POL 151, plus an additional course in comparative politics.
3 credits

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

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

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

POL 241 Political Attitudes and Propaganda

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) the nature, varieties, and actual effects of propaganda. Some attention will also be given to attitude research methods.
3 credits

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 ideology and the problems of political leadership in a democracy.
3 credits

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

POL 245 The Politics of Community Action

Demands for "community control," "decentralization," and "participation of the poor" have been prominent in the community politics of recent years. The course examines the theoretical and practical implications of these concepts within the general framework of political participation and their impact on local political institutions. Among the specific areas studied are health, housing, welfare, police, and anti-poverty programs.
3 credits

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

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

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

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

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

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

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

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

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

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

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

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

POL 262 Political Mobilization: Theories and Cases

How are activists, interest groups, and parties initially assembled, motivated, organized, disciplined, and sustained? A variety of theories as advanced by liberalism, pluralism, Marxism, functionalism will be analyzed and compared with descriptions of such processes in cases such as student movement, Nazism, Bolshevism, and older revolutionary movements.
3 credits

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

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

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

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

POL 276 Experimental Political Behavior

The course will focus on selected topics in political psychology, employ experimental techniques, and emphasize psycho-physiological measures of response patterns. Laboratory projects will be carried out by students in the department's psychophysiological laboratory.
Prerequisites: POL 191, PSY 101, 102 or permission of instructor.
3 credits

POL 281 Introduction to Mathematical Applications in Political Analysis

Basic introduction to the formal study of group decision-making, political inequality, political ideology, and political communication. No mathematics prerequisites other than high school algebra. Oriented toward mathematics as a language of discourse.
3 credits

POL 282 Topics in Mathematical Applications in Political Science

Basic introduction to the formal study of power and social choice, especially game theory models of social conflict, bargaining theory, and simulation of political behavior. No mathematics prerequisites other than high school algebra.
3 credits

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

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

POL 330 Topics in American Constitutional Law

An advanced treatment of the work of the United States Supreme Court in selected areas of civil liberties and civil rights. Particular attention is given to the methods used in legal research and analysis. A major research paper is required.
Prerequisites: POL 200, POL 230, and permission of instructor.
Spring, 3 credits

POL 332 Topics in Comparative Judicial Analysis

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.
Prerequisites: POL 151, POL 200, POL 232, and permission of instructor.
Fall, 3 credits

POL 391, 392 Seminars in Advanced Topics

Special projects and research papers on a topic of political interest which will be announced before the start of the term.
Prerequisite: Permission of department.
3 credits each semester

POL 399 Directed Research

Qualified advanced undergraduates in political science may carry out individual research projects under the direct supervision of a faculty member. No student will be permitted to enroll in this course for more than two semesters or receive more than six credits for the course (a maximum of three per semester).
Prerequisites: Approval of a faculty sponsor and of the department.
Fall and Spring, 1 to 3 credits

DEPARTMENT OF PSYCHOLOGY

Professors: BRAMEL, GARCIA *(Chairman)*, KALISH, KRASNER, M. LEVINE, MERLIS *(Visiting Clinical Professor)*, F. PALMER, ROSS *(Director of Clinical Training)*, SINGER, STAMM, WYERS

Associate Professors: CROSS, DAVISON, D'ZURILLA, GEER, GOLDFRIED, KAYE, F. LEVINE, LIEBERT, MENZEL, MORRISON, O'LEARY, POMERANZ, RACHLIN, SCHVANEVELDT, VALINS

Assistant Professors: BRANSFORD, CALHOUN, DOLL, EMMERICH, FEHMI, FRIEND, M. JOHNSON, KESTENBAUM, NEALE, S. STERNGLANZ, TWEEDY, WEINTRAUB, WHITEHURST

Clinical Associate: H. A. BROWN

Requirements for the Major in Psychology

In addition to the general university requirements for the Bachelor of Arts degree, the following courses are required for the major in psychology:

A. Study within the area of the major
   Completion of 26 units in psychology
   PSY 101, 102 Introduction to Psychology
   PSY 162 Statistical Methods in Psychology
   PSY 199 Experimental Methodology
   PSY 200 Experimental Methodology Lab
   One of the following laboratory courses: PSY 201, 202, 203, 204, or 206.
   Nine credit hours in psychology electives, no more than six to be chosen from the 391, 392, 393 series.

B. Study in related areas
   1. MSM 121 Calculus or MSA 101 Finite Mathematical Structures I
   2. Courses in biological sciences
      a. BIO 101 *and* 102; or 150 or 171
      b. BIO 107
      c. One additional BIO course (BIO 103, 104, 111, 303, 304, 381, 382, 383 are recommended.)
   3. Two courses in anthropology or in sociology or one course in each.

Courses which fulfill the requirements for the major (A and B) must be taken for grade credit. Courses listed in Section B may also fulfill university requirements.

The program outlined above presents the general major requirements. In addition, the department recommends that students who wish to take a

more intensive program or who plan to enter graduate school elect further courses in psychology and incorporate into their programs study in some of the following areas: computer science, chemistry, physics, biology, and mathematics beyond the requirement, history and philosophy of science, and additional courses in the social sciences.

COURSES IN PSYCHOLOGY

PSY 098, 099 Fundamentals of Psychology

To introduce the student to the nature and interests of the department of psychology and to develop the skills, methods, and procedures required for effective participation in subsequent courses.
Fall and Spring, no credit

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. Stuents 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

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

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

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.
Coresquisite: PSY 199.
Fall and Spring, 2 credits

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 investigated.
Prerequisite: PSY 200.
Fall and Spring, 4 credits

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

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

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

PSY 206 Laboratory in Learning and Performance

Experimental methodology as applied to associative and motivational processes: response acquisition and extinction, reward and punishment, discrimination learning, retention, perceptual-motor skills, and cognitive processes.
Prerequisite: PSY 200.
Spring, 4 credits

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

PSY 209 Social Psychology

Communication, attitude formation and change, social perception, interpersonal relations, and group performance.
Prerequisites: PSY 101, 102; not open to students who have taken PSY 309.
Fall and Spring, 3 credits

PSY 210 Studies of Social Conflict

Students will formulate and carry out team research projects focusing on issues involving conflict within the University or in the surrounding communities.
Prerequisites: PSY 101, 102, 162, and permission of instructor.
Spring, 3 credits

PSY 211 Developmental Psychology

A study of the growth processes from fetal development to late childhood. Perceptual and learning characteristics are explained as they relate to increases in cognitive and social competence in the total community. Biological factors are examined as they relate to inheritance of behavior patterns.
Prerequisites: PSY 101, 102.
Fall and Spring, 3 credits

PSY 213 Behavior Deviation in Children

Development and modification of behavioral deviations in children. Application of principles derived from experimental analysis of behavior to problems of children.
Prerequisites: PSY 211 and permission of instructor.
Fall and Spring, 3 credits

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

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

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

PSY 220 Motivation

Theories of motivation from biological to existential and how they apply to human behavior.
Prerequisites: PSY 101, 102.
Spring, 3 credits

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

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

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

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.
Fall, 3 credits

PSY 315 Behavior Modification

Philosophical and experimental foundations of behavior modification. Not designed for specific training in clinical techniques, but issues related to clinical application will be considered.
Prerequisites: PSY 101, 102, 162, 200, 215, and at least junior standing.
Fall and Spring, 3 credits

PSY 322 Advanced Statistics

Survey of probability and sampling theory, descriptive and inferential statistics, and introduction to experimental design.
Prerequisite: PSY 162 or permission of instructor.
Fall and Spring, 3 credits

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 and the department.
Fall and Spring, 1 to 3 credits each semester, may be repeated.

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 and the department.
Fall and Spring, 1 to 3 credits each semester, may be repeated.

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

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

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

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

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.
Staff
Fall and Spring, 3 credits

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

PSY 372 Tests and Measurements in Personality

A study of principles of psychological assessment of personality with emphasis on theory and practice and principles of measurement theory and correlational techniques. Students will have opportunity to develop a personality test and put these principles and techniques into practice.
Prerequisites: PSY 101, 102, and permission of instructor.
Fall, 3 credits

PSY 373 Theory of Psychological Scaling

Analyzes alternative models for transforming behavioral observations into inferred relations among stimuli and/or individuals. Presents a framework within which the various scaling techniques can be grouped and their relationships understood, considering tasks to which the methods may apply, information which can be inferred, and testable consistencies implied.
Prerequisite: PSY 162 or permission of instructor.
Spring, 3 credits

PSY 381, 382 Introduction to Mathematical Psychology

Mathematical formulations of theories of behavioral phenomena, with emphasis on learning. Attention to turning intuituion 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

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

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, permission of instructor and permission of department.
Fall and Spring, 3 credits each semester

PUERTO RICAN STUDIES PROGRAM

Coordinator: GONZALEZ DE STRATMANN

The Puerto Rican studies program, which began offering courses in 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.
Prerequisites: 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 299 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.
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 not intended as preparation for graduate study in religion but rather as an opportunity for interested students to explore a wide range of views of past and present thinkers. The courses listed below have been chosen as appropriate for the religious studies major. The student, in consultation with his academic advisor, may combine them in a variety of ways to create a program which meets his individual interests. Additional courses are under consideration and will be announced as they become available.

Further information about the program may be obtained from the chairman.

Requirements for the Major in Religious Studies

In addition to the general university requirements for the Bachelor of Arts degree, a student majoring in this program must earn a minimum of 30 credits distributed as follows:

	Credits
I. At least two semester courses in each of three areas:	24
A. Religious literature	
B. Theory of religious thought	
C. Socio-historical studies of religion	
II. Two semester 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 History of 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 1972-73)
POL 263 Utopias
PSY 392 Psychology, Philosophy, and Religion
SOC 235 Sociology of Religion
THR 254 Oriental Theatre and Drama

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

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

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.
Fall, 3 credits

RLS 230 Theological Ethics

A study of Christian, Jewish, and secular attempts since the Hitler era to come to terms with the problem of action. Why act at all? For what? How? The person and his (her) communities. Readings in fascism and existentialism, but chiefly an American focus.
Prerequisite: Permission of instructor.
Fall and Spring, 3 credits

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 3 credits

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 follows:

	Credits
A. Two course 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 advisor, two of these courses may be chosen from appropriate offerings in black studies, environmental studies, or social welfare.)	
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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. Special emphasis is placed on giving a brief introduction to the empirical or quantitative methods now being used by social scientists (among others, statistics, demographic analysis, and economic analysis). Various faculty members will give guest lectures.
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: Junion 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. This course is identical with HIS 330.
Prerequisite: Nine hours of Latin American history or the equivalent.
Spring 3 credits

DEPARTMENT OF SOCIOLOGY

Distinguished Professor: L. COSER

Professors: R. COSER, DOGAN, [a]GAGNON, LANG, [a]PERROW, [a]SELVIN, SCHILD, SINGER, WEENSTEIN *(Chairman)*

Associate Professors: COLE, COLLVER *(Director of Undergraduate Program)*, FELDMAN, GOODE, GOODMAN, POLSKY, STREET *(Director of Graduate Program)*, SUTTLES

Assistant Professors: BERGER, BRYSON, HARRISON, PHILLIPS, SCHWARTZ, TUCHMAN, WEITMAN

Instructor: TANUR

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)

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

[a] On leave academic year 1972-73.

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 advisor.

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 advisor.

B. At least three appropriate courses chosen from a single social science in consultation with the advisor.

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 advisor. The following requirements must be met:

1. A 3.3 cumulative grade point average in all sociolgy 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 his 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 courses in sociology.
3 credits

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

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

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

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

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

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

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

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

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

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

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

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

SOC 235 Sociology of Religion

The ways in which sociocultural processes affect and are influenced by religious belief systems and organizations; changing struc-

tures and functions of religious institutions.
Prerequisite: SOC 103 or permission of instructor.
3 credits

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

SOC 291, 292 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 each semester

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

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

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

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

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

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

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

SOC 394, 395 Readings in Sociology

Selected readings, usually in a special area, to be arranged by the student and the instructor. A student may register for each course only once.
Prerequisites: Junior or senior standing, major in sociology, and permission of department.
1 to 6 credits each semester

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

DEPARTMENT OF THEATRE ARTS

Professor: NEWFIELD

Associate Professors: AUERBACH *(Chairman),* BRUEHL, DYER-BENNET, R. HARTZELL

Assistant Professors: DELL, FINLAYSON, NEUMILLER, OLF
Instructor: BOND

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. Any three of the following two semester course sequences:	18
1. THR 323, 324 The Dramatic Tradition	
2. THR 325, 326 Theatre History: Readings, Colloquies, Projects	
3. THR 327, 328 Contemporary Drama and Theatre	
4. THR 329, 330 Experimental Theatre Workshop	
B. Either THR 241 Production Workshop or THR 242 Workshop in Stage Technique	3

C. Seven additional courses chosen with approval of the departmental advisor and distributed as follows:

1. Three 100-level courses	9
2. Four 200- or 300-level courses not included in A or B above	12
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COURSES IN THEATRE ARTS

THR 101 Introduction to the Theatre

An introduction to, and analysis of, the forms of theatre. Classes will include films, lectures by specialists within and outside the University community, and live and electronic demonstrations. All presentations will be followed by discussion.
Fall, 3 credits

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

THR 131 The Nature of Drama

The fundamentals of dramaturgy: the elements of drama, dramatic composition, plot, characterization, dramatic language. Readings of significant plays from the repertoire of world drama in connection with available records of their theatrical productions.
Fall and Spring, 3 credits

THR 132 Fundamentals of Technical Theatre

The planning, construction, and handling of stage scenery and properties.
Fall and Spring, 3 credits

THR 133 Voice and Diction

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

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.
Fall and Spring 3 credits

THR 137 Cinema . . . Now and Then

Beginning now, with Godard, Lester, and Leacock (and Brakhage, Clarke and Mailer too), this course defines what movies are and how they came to be what they are. A large number of movies are viewed, as students learn to identify those qualities which make a movie filmic. While the course is not a history of the film, it does describe the traditions and identify the traditionmakers of this youngest of the arts.
Fall, 3 credits

THR 138 Movement as Medium

An examination and an extension of the movement patterns of everyday life aimed at better physical functioning; an exploration of movement as a medium of behavior.
Fall and Spring, 3 credits

THR 139 Movement for Actors

An examination of movement focused on the individual student's preferred movement patterns. An extension of these patterns to allow the actor more choices in performing.
Prerequisites: THR 136 and permission of instructor.
Fall and Spring, 3 credits

THR 143 Stage Design I

Introduction to the esthetics, history, and theory of stage design with special emphasis on perspective and mechanical drawing for the stage.
Fall, 3 credits

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

THR 236 Stage Costume

An introduction to the history and esthetics of stage costumes and the fundamentals of costume design. The technique of theatrical make-up.
Prerequisite: Permission of instructor.
Fall and Spring, 3 credits

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

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

THR 239 Directing

The process of selecting the play and preparing its production. Problems of interpretation. The production book.
Prerequisites: THR 132 and 136.
Fall, 3 credits

THR 241 Production Workshop

Students in the course, in addition to working with the instructor throughout the planning, preparation, and execution of a major theatre event, will assume key positions of responsibility such as production manager, assistant production manager, and principal acting roles. May be repeated, but may count toward major once only.
Prerequisite: Permission of instructor.
Fall and Spring, 3 credits

THR 242 Workshop in Stage Technique

Students will have the opportunity to combine theory and practical experience in all aspects of stagecraft. They will work with the faculty in planning and executing real projects in costume, sound, lighting, and set construction in connection with University and other departmental productions. May be repeated, but may count toward major once only.
Prerequisites: THR 132 and 143.
Fall and Spring, 3 credits

THR 243 Stage Design II

Principles of design for the theatre including color composition and rendering techniques. These techniques are related to the esthetics both of dramatic composition and the flexibility of modern staging.
Prerequisites: THR 132 and 143.
Fall, 3 credits

THR 251 Mime

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

THR 252 Film-Making Workshop

Instruction in planning short films and experience in executing the plans. A student may make his own film or assist a more advanced film-maker according to the discretion of the instructor. Such technical skills (lighting, sound recording, editing) as are required by the films being made will be taught.
Prerequisites: THR 234 and permission of instructor.
Fall, 3 credits

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.
Fall and Spring, 3 credits

THR 254 Oriental Theatre and Drama

(Formerly THR 340)
Readings and discussions of the esthetic principles, theatre practice and dramatic literature of selected Asian nations. There will be emphasis on the various forms, both ancient and contemporary, of Japan.
Prerequisite: Permission of instructor.
Fall, 3 credits

THR 321 Workshop in Dialects and Voices

Students will study the characteristics of selected dialects of the English language and attempt to develop a fluency in the various sound patterns and idiomatic usages. Portable tape recorder required.
Prerequisites: THR 133, 237, and permission of instructor.
Spring, 3 credits

THR 322 Ensemble Acting

Development of a craft for the experiments now being carried on in post-Stanislavskian ensemble acting. Improvisations, transformations, vocal patterns and rhythms, non-naturalistic exercises, emphasis on movement as external manifestation of internal impulse, all designed to stimulate ensemble creativity.
Prerequisites: THR 237 and permission of instructor.
Spring, 3 credits

THR 323, 324 The Dramatic Tradition

Each year a different facet of the dramatic tradition will be analyzed in the context of modern theatre. Thus, e.g., one year's work might explore Greek tragedy: the classical models, the later developments and the place of Greek tragedy in modern drama and tradition. During another year the work might involve Shakespearean comedy, or medieval religious drama, or 17th century French drama, etc. During the first semester emphasis will generally be theoretical and historical and prepare the way for various projects, either artistic or scholarly, in the second semester. May be repeated, but may count toward the major once only.
Prerequisites: Junior-senior standing and permission of instructor.
Fall and Spring, 3 credits each semester

THR 325, 326 Theatre History: Reading, Colloquies, Projects

Assigned readings in selected chapters from the history of the theatre with special emphasis on the relation of theatre to society. Bi-weekly colloquies. Independent research projects. Production projects, concentrating on different historical styles.
Prerequisites: Junior-senior standing and permission of instructor.
Fall and Spring, 3 credits each semester

THR 327, 328 Contemporary Drama and Theatre

An intensive study of theories of the modern stage from Craig to the present and of stage production from the theatre of the absurd to the contemporary experimental and underground theatre. Readings, colloquies, workshop, productions.
Prerequisites: Junior-senior standing and permission of instructor.
Fall and Spring, 3 credits each semester

THR 329, 330 Experimental Theatre Workshop

Work begins with an untried hypothesis probing new directions in performance or production. Projects may be focused on one idea advanced by the instructor or on several ideas advanced and developed by the students individually. First semester will be concerned with exploration in workshop of theoretical ideas; second semester will be concerned with the shaping and prepara-

tion for performance of material developed earlier. May be repeated. May count towards the major once only.
Prerequisites: Junior-senior standing and permission of instructor.
Fall and Spring, 3 credits each semester

THR 334 Projects in Film-Making

An opportunity for advanced work in individual projects in film-making.
Prerequisites: Junior-senior standing and permission of instructor.
Fall and Spring, 1 to 6 credits

THR 336 Projects in Design

Practice in stage design; analysis and expression of the play in scenic terms. Individual work.
Prerequisites: THR 243 and permission of instructor.
Fall and Spring, 1 to 3 credits

THR 341 Projects in Acting

An opportunity for advanced work in individual projects in acting.
Prerequisites: Junior-senior standing and permission of instructor.
Fall and Spring, 1 to 3 credits

THR 344 Projects in Directing

An opportunity for advanced work in individual projects in stage and cinema directing.
Prerequisites: Junior-senior standing and permission of instructor.
Fall and Spring, 1 to 6 credits

THR 347 Projects in the History of Drama and Theatre

An opportunity for advanced work in individual projects in the history of drama and theatre.
Prerequisites: Junior-senior standing and permission of instructor.
Fall and Spring, 1 to 3 credits

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

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

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

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.

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, 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.

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

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

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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.

1. Art: the first two semesters of the studio courses ART 120, 121, 122, 123, 124, 126.
2. Music: performance or studio courses MUS 114, 115, 116, 151 and the first two semesters of MUS 161-199 and MUS 261-299.
3. English courses in composition EGL 101, 102, 105; and theatre arts courses in diction: THR 130, 133.
4. Foreign language courses below the intermediate, i.e., second year, level.

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.

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.

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, 151 ..... 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 advisor as appropriate to his 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 (except foreign language skill courses) or the social and behavioral sciences. 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 currrent 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 151, 154
PHY 151

Junior Year

ESG 212 and one of ESG 213-217
MSI 155 or aproved 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 advisor when preparing a program for his junior and senior years. This program must include seven technical electives.

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 busi-

* May be taken anytime before the fourth semester.

ness, 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 advisors 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 336 Modern Theory of Solids
ESM 306 Mechanical Properties of Engineering Materials
ESM 309 Thermodynamics of Solids
ESM 325 Diffraction Techniques and the Structure 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 advisor in the field. Typical elective sequences are as follows:

Energy and Environmental Engineering
ESC 305, ESC 322, ESC 323, ESC 345, ESC 372, ESC 379, ESC 397, ESC 398, BIO 155, ESE 351

Fluid Mechanics and Geophysics
ESC 345, ESC 361, ESC 372, ESC 375, 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 advisors. 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 392 Dynamical Oceanography
ESC 372 Experimental Fluid Mechanics
ESC 330 Structural Analysis

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 advisor in the field.

ESC 361 Vehicular Dynamics
ESM 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 advisors 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 advisors. 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—Advisor V. A. Marsocci; Pre-law—Advisor S. S. L. Chang; Pre-business administration—Advisor 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 requirements for the Bachelor of Science degree with the major in computer science can be found

on pages 53, 175. The electives required for an engineering student to satisfy requirements for a B.S. in computer science are:

> MSC 102, 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 degrees 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 Department of Applied Mathematics and Statistics. MSA also designates the undergraduate applied mathematics major
MSC: Courses offered by the Department of Computer Science. MSC also designates the undergraduate computer science major
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 circuits.
Corequisite: ESG 171.
Spring, 2 credits

ESG 161 Particle and Rigid Body Mechanics

A review of vector algebra and calculus with kinematic applications such as curves in space, displacement, velocity, and acceleration of point particles in classical orthogonal coordinate systems; notion of force; statics of a single particle including gravity, friction, electrostatic and magnetostatic forces; force as a vector field; moment about a point, and moment about a line, couples, work; equivalent force systems and the wrench; equilibrium of systems of mass particles; special case of the rigid body. Rigid body kinematics and the 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 151.
Fall, 4 credits

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 electri-

cal sciences. Such topics as signal analysis, electrical measurements, Kirchhhoffs laws, linear circuit analysis via Laplace transforms, semiconductor devices and basic electronic ciruits 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 151 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 151.
Fall, 4 credits

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

ESG 213 Engineering Experimentation: Applied Mathematics and Statistics

ESG 214 Engineering Experimentation: Computer Science

ESG 215 Engineering Experimentation: Electrical Sciences

ESG 216 Engineering Experimentation: Materials Science

ESG 217 Engineering Experimentation: Mechanics

An independent project under faculty supervision which emphasizes the principles of experimental design and data evaluation. Projects will generally be undertaken by teams of two students from a selection of problems submitted by the engineering faculty or suggested by the student with faculty approval. Students should register for the one course number above that names their faculty project advisor's department.
Prerequisites: ESG 111, ESG 212.
Spring, 2 credits

ESG 232 Materials Science I: Structure and Properties of Materials

A study of the relationship between the structure and properties of engineering materials and the principles by which materials properties are controlled. The structure and structural imperfections in simple crystalline materials, and the role which these factors play in defining electrical conductivity, chemical reactivity, strength, and ductility are considered. The molecular structure of polymers is discussed, and related to the behavior of plastics, rubbers, and synthetic fibers. The principles of phase equilibria and phase transformations in multicomponent systems is developed. These principles are applied to the control of the properties of semiconductors, commercial plastics, and engineering alloys by 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

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, and 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

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

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

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

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 nonscientific 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 151.
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

NOTE: ESG 211 and ESG 212, ESG 251 and ESG 252, of the old curriculum, will be offered for the last time this year.

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

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, transportation, 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

ESI 200 Independent Study Project

See page 250.
Fall and Spring, variable up to 18 credits each semester, repetitive

INTERDEPARTMENTAL TECHNICAL ELECTIVES

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

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 in-

troduction to the applications of economic and system analysis to decision-making problems arising in engineering and industry. Topics covered include nature of the business enterprise, cash flow and financial statement analysis, the cost of capital, economic life, taxes, analysis under risk and uncertainty, return on investment and the evaluation of engineering alternatives, budgeting techniques, inventory and critical path techniques, corporate financing, and patent aspects of engineering.
Fall, 3 credits

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

DEPARTMENT OF APPLIED MATHEMATICS AND STATISTICS

Professors: Beltrami, Dicker, Dolezal, Gerst, Tewarson, Zemanian *(Acting Chairman)*

Associate Professors: Y. M. Chen, Duncan, Kim, [a]Leibowitz, Srivastav, Thampuran

Assistant Professor: Tucker

DEPARTMENTAL TECHNICAL ELECTIVES

MSA 390 Research in Applied Mathematics and Statistics

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 his 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

MSA 201, 202 Finite Mathematical Structures I, II

Boolean structures and logical relations, elementary combinatorial analysis and graph theory, with applications to such topics as linear programming, network flows, block designs and coding theory.
Corequisite: MSM 151.
Fall and Spring, 3 credits each semester

MSA 217 Ordinary Differential Equations

This course deals with the theory and properties of ordinary differential equations which are of importance in the appli-

cation 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, Lienard, and Duffin equations; approximate solutions.
Prerequisite: MSM 151.
Fall and Spring, 3 credits

MSA 226 Numerical Analysis

Direct and indirect methods for the solution of linear and non-linear equations. Computation of eigenvalues and eigenvectors of matrices. Quadrature, differentiation, and curve fitting. Numerical solution of ordinary and partial differential equations.
Prerequisites: MSC 101, MSM 151.
Fall, 3 credits

MSA 227 Approximation Theory

Smoothing of data, least squares methods, interpolation, polynomial approximation, and quadrature formulas.
Prerequisite: MSM 152 or MSM 154.
Spring, 3 credits

MSA 250 Introduction to Mathematical Statistics

Probability spaces, random variables, algebra of expectations, random sampling, law of large numbers, estimation of parameters, confidence intervals, regression, hypothesis testing. Students interested in probability theory and a more thorough treatment of statistical analysis should take MSA 251, 252. This course cannot be taken for credit in addition to MSA 251, 252.
Prerequisite: MSM 121.
Fall and Spring, 3 credits

MSA 251, 252 Probability and Statistics I, II

Finite, discrete, and continuous probability distributions; random variables, conditional probability; multivariate distributions; laws of large numbers; central limit theorem. Statistical applications: random sampling, estimation, hypothesis testing, regression analysis, and correlation. Further topics.
Prerequisite: MSM 121.
Fall and Spring, 3 credits each semester

MSA 301, 302 Principles and Techniques of Applied Mathematics I, II

Linear operators and spectral theory applied to differential operators. Eigenfunction expansions, Green's functions and distributions; integral transforms.
Prerequisite: MSM 152 and permission of instructor.
Fall and Spring, 3 credits each semester

MSA 316 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 or MSM 154.
Fall, 3 credits, alternate years

MSA 321 Mathematics of Networks

A review of the mathematical techniques which are fundamental in the analysis and synthesis of electrical networks and of other network structures. The course is mainly centered around the properties of certain classes of analytical functions. However, various algebraic and topological properties of networks may also be introduced depending on the interests of the instructor.
Prerequisite: MSM 152 or MSM 154.
Spring, 3 credits, alternate years

MSA 324 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 the computer. An introduction to non-linear programs, with particular emphasis on algorithmic procedures.

Prerequisite: MSC 101, MSM 152 or MSM 154.
Spring, 3 credits

MSA 325 Introduction to Operations Research

Methods and techniques for stochastic modeling and optimization, with applications to queuing theory, Markov chains, inventory theory, games, and decisions.
Prerequisites: MSA 251, MSM 151.
Fall, 3 credits

MSA 331 Mathematical Models in the Social Sciences

Methods of mathtmatical modeling with particular emphasis on areas such as ecology, sociology, economics, and psychology. Topics chosen will depend on the background and interest of the class.
Prerequisites: MSA 251 and permission of instructor.
Spring, 3 credits

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

Methods of mathematical modeling with particular emphasis on such areas as particle mechanics, continuum mechanics, and on wave propagation. Topics chosen will depend on the background and interests of the class.
Prerequisite: MSI 202.
Fall and Spring, 3 credits each semester

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, alternate years

DEPARTMENT OF COMPUTER SCIENCE

Professors: FINERMAN, [a]GELERNTER, HELLER, [a]KIEBURTZ *(Chairman)*, [a]D. R. SMITH, TYCKO

Associate Professor: BERNSTEIN

Assistant Professors: AKKOYUNLU, FIDUCCIA

DEPARTMENTAL TECHNICAL ELECTIVES

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

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 his 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

MSC 302 Structure of Digital Computers

Interconnection of registers, memories, logic, and busses to achieve efficient com-

[a] On leave academic year 1972-73.

puter systems, drawing examples from current computers with popular or distinctive structures. A "register transfer" language is used throughout as a teaching vehicle and to stimulate computer structures on the IBM 360 and PDP-16.
Prerequisites: MSC 102 and ESE 318.
Spring, 3 credits

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

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

DEPARTMENT OF ELECTRICAL SCIENCES

Professors: CHANG, MARSOCCI *(Chairman)*, [a]D. R. SMITH, STROKE, TRUXAL

Associate Professors: [a]C. T. CHEN, DOLLARD, RAPPAPORT, THOMAS, TUAN

Assistant Professors: BARRY, CARROLL, HARRISON, WAYNE

Instructor: SHORT

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 his 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

ESE 303 Electronic Circuits and Instrumentation

A course which presents the elements of electronic circuitry and instrumentation at an introductory level. Operation of vacuum tubes, transistors, and other electronic devices. Operational aspects of power supplies, amplifiers, oscillators, and logic circuits. Application to industrial and scientific 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

[a] On leave academic year 1972-73.

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, and automated measurement systems. Applications of measurement system to pollution, biomedical and industrial monitoring will be considered.
Prerequisite: ESG 252.
Spring, 3 credits

ESE 310 Modern Circuit Theory

Matrix representation of circuits. Applications to filter and transmission lines and coaxial cables. Introduction of controlled sources to represent active elements. 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.
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, design procedures such as optimal regulator synthesis, parameter optimization, root-locus, Bode plots, and Nyquist diagrams are introduced and applied via analog and digital computer simulations.
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 who require the use of digital equipment in connection with their experiments, 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

ESE 319 Introduction to Electromagnetic Fields and Waves

Fundamental experimental results of electromagnetism. Mathematical formulation of integral laws using vector calculus. Deri-

vation 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, and applications to communications systems, radar, and radio astronomy. Some of the topics included are: radio waves in the ionosphere, guided wave propagation, transmission lines and wave guides, basic antenna theory, low-noise antennas, introduction to statistical electromagnetic theory, data-processing antenna arrays, radio astronomy antennas.
Spring, 3 credits

ESE 330 Integrated Electronics

An introduction to semiconductor electronics leading to the characterization of various passive and active devices, with emphasis on integrated-electronic structures. Theory of p-n junctions, the operation of transistors; the characterization of integrated electronic elements, such as passive devices, diodes, and transistors, in terms of equivalent circuits; the applications of these devices in active networks; linear amplifiers, switching characteristics of transistors, switching circuits.
Prerequisite: ESG 252.
Fall, 3 credits

ESE 331 Physical Electronics

A study of the physical principles involved in the operation of electronic devices. The order of topics is: crystalline nature of solids, wave mechanics and nature of electrons and atoms, energy bands in solids, statistics of metals and semiconductors, dielectric and magnetic properties, charged particle dynamics, electron theory of metals, vacuum tubes, semiconductors, semiconductor devices, elementary quantum electronic theory of maser, laser, and superconductor.
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

ESE 350 Electrical Power Systems

The course presents fundamental engineering theory for the design and operation of a modern electric power system. Modern as-

pects 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 overhead lines and underground cables, generalized circuit constants, transformers, control of power flow and of voltage, per unit system of computation, system stability, extra high voltage a.c. and d.c. transmission.
Prerequisite: 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 magnetohydrodynamic converters, fuel cells, and cells. Bioenergetics.
Prerequisite: ESG 101.
Fall, 3 credits

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 correltors, holographic interferometry (vibration and stress analysis), microwave, radar, and acoustical imaging.
Prerequisite: Senior standing or permission of instructor.
Fall, 3 credits

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

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 their parameters from input-output data. Examples will be chosen 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, SEIGLE, [a]THOMSON

Associate Professors: BILELLO, CARLETON, HERMAN, JACH, [a]R. SIEGEL, [a]F. WANG *(Chairman)*

Assistant Professors: PREECE, STROZIER

[a] On leave academic year 1972-73.

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 his 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

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

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.
Prerequisites: 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 thermodynamics 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

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

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

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

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: [c]BERLAD, BRADFIELD, CESS, IRVINE, R. S-L. LEE *(Chairman)*, O'BRIEN, STELL, C. H. YANG

Associate Professors: CHIANG, [a]HARRIS, [b]TASI, L-S. WANG

Assistant Professors: CHEVRAY, VARANASI

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 his 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

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)

ESC 305 Heat and Mass Transfer

The fundamental laws of momentum, heat, and mass transfer are discussed, and the corresponding transport coefficients are examined for gases using elementary kinetic theory. Principles of steady-state and transient heat conduction in solids are investigated. Analyses of laminar and turbulent boundary layer flows are treated, as well as condensation and boiling phenomena. Thermal radiation, including the analogy between molecular and photon transport, is discussed. Radiation heat transfer between surfaces is treated, as well as the derivation and application of the radiation flux equation for absorbing-emitting media.
Prerequisites: ESG 101 and ESG 264.
Mr. T. F. Irvine Jr.
Fall, 3 credits

ESC 322 Nonequilibrium Processes in Environmental Systems

Introduction to the kinetic rate processes, flow and stability of nonequilibrium systems. Combustion, condensation, vaporization, and related environmentally important thermokinetic processes. Thermokinetic stability and the stability of coupled ecological systems. Combustion and air-pollution. Applications to nonequilibrium atmospheric processes.
Prerequisite: ESG 201
Mr. A. Berlad
3 credits

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. Radiactive properties of flames. Dust explosions. Applications to modern systems.
Prerequisite: ESG 201.
Mr. A. Berlad
Fall, 3 credits

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[a] On leave academic year 1972-73.
[b] On leave fall semester 1972.
[c] On leave spring semester 1973.

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.
Mr. J. Tasi
Spring, 3 credits

ESC 332 Model Analysis of Architectural and Civil Structures

The course concerns the use of models to study the behavior of structures under various loadings. The principle of similitude which governs the relationship between a model and its prototype will be discussed in detail. The principle of Muller-Breslau and the methods based on the principle for obtaining influence lines will be demonstrated. Students will be formed into small groups and each group will carry out a complete project involving the design, manufacture, testing, and analysis of the model.
Prerequisite: ESG 263.
Mr. F. P. Chiang
Spring, 3 credits

ESC 334 Structural Design

Introduction to structural design codes. Analysis of loading. Design of steel compression members, beams, built-up sections, and riveted, bolted, and welded connections. General planning of foundations. Design of concrete footings and reinforced concrete beams, columns and slabs.
Corequisite: ESC 330.
Mr. C. H. Yang
Spring, 3 credits

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 gage, 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.
Mr. F. Chiang
Fall, 3 credits

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.
Mr. R. Cess
Spring, 3 credits

ESC 361 Vehicular Dynamics

Structural load bearing phenomena. 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. Static and dynamic stability. Hydrodynamic and structural applications to vehicles of current and future interest.
Prerequisite: ESG 264.
Mr. W. Bradfield
Spring, 3 credits

ESC 372 Experimental Fluid Mechanics

Fundamentals of measurements and instrumentation. Operating principles and performance characteristics of instruments for measurement of physical quantities such as velocity, pressure, and temperature. 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.
Mr. R. Chevray
Fall, 3 credits

ESC 375 Viscous Fluids

The role of viscosity in the dynamics of fluid flow is explored. The Navier-Stokes equations are developed, some exact solutions obtained, dynamical similarity established, and Reynolds number introduced. Low Reynolds number behavior is studied including lubrication theory, percolation through porous media, corner flows, viscosity of dilute suspensions of small particles, and flow due to moving bodies. Behavior of flow due to moving bodies at moderate Reynolds number is described as is high Reynolds number behavior including vorticity dynamics, steady, unsteady, and detached boundary layers, flow due to steadily moving bodies, jets, free shear layers, and wakes.
Prerequisites: ESG 264, MSM 154.
Mr. E. O'Brien
Fall, 3 credits

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.
Mr. P. Varanasi
Spring, 3 credits

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.
Mr. J. Tasi
Fall, 3 credits

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.
Mr. G. Stell
Spring, 3 credits

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.
Mr. E. O'Brien
Spring, 3 credits

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.
Mr. S. Harris
Fall, 3 credits

ESC 398 Intermediate Thermodynamics

The transformations of heat into mechanical work; the principle of the conservation of energy; the limitations involved in the transformation of heat into work. The role of energy in the biosphere and the role of the environment as the (sink) reservoir will also be discussed.
Prerequisite: ESG 101.
Mr. L-S. Wang
Spring, 3 credits

PROGRAM IN URBAN AND POLICY SCIENCES

Professors: BELTRAMI, NATHANS *(Chairman)*

Associate Professors: ALTMAN, BLUM, EHLERS

Assistant Professor: BODIN

TECHNICAL ELECTIVE

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 his 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 his 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 1971-72, all of the schools, except dental medicine, were in the initial or second year of operation, and their combined student enrollment totalled over 400. 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 1972, the School of Allied Health Professions is offering baccalaureate degree programs in Cardiopulmonary Technology/Respiratory Therapy; Health Sciences Technology; Medical Technology; Physical Therapy; and School/Community Health. (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 1972, the Health Sciences Center is enrolling M.D. candidates in the School of Medicine and masters degree candidates in the Schools of Social Welfare and Allied Health Professions (Health Services Administration). The School of Dental Medicine plans to admit its first degree candidates in 1973. 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 undergraduate 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.

DIRECTORIES

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	Officers of Administration
	Members of the Faculty
	Health Sciences Center
	Administration
	Health Sciences Center Faculty
	Members of the University Staff
STATE UNIVERSITY OF NEW YORK	General Description
CAMPUS MAP	Campuses
TRANSPORTATION TO STONY BROOK	

STATE UNIVERSITY OF NEW YORK
BOARD OF TRUSTEES

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HUGH R. JONES, A.B., LL.B. ..... Utica
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Chancellor of the University ..... ERNEST L. BOYER, A.B., M.A., Ph.D., Litt. D., L.H.D., LL.D.
Secretary of the University ..... MARTHA J. DOWNEY, B.S., M.A.

STATE UNIVERSITY OF NEW YORK AT STONY BROOK
MEMBERS OF THE COUNCIL

Subject to powers of the State University trustees defined by law, the operations and affairs of the State University at Stony Brook are supervised locally by a Council appointed by the Governor. Members of the Council at time of printing are listed below:

SAMUEL G. EASTERBROOK
Dix Hills

DONALD J. LEAHY
Douglaston

J. KEVIN MURPHY
New York City

WILLIAM H. MURPHY
Woodbury

JERALD C. NEWMAN
North Woodmere

PETER J. PAPADAKOS
St. James

JOHN V. SCADUTO
Long Beach

GEORGE P. TOBLER, *Chairman*
Smithtown

WARD MELVILLE, *Honorary Chairman*
Stony Brook

OFFICERS OF ADMINISTRATION

All positions listed are correct as of March 15, 1972.

JOHN S. TOLL, B.S., A.M., Ph.D.
President

T. ALEXANDER POND, A.B., A.M., Ph.D.
Executive Vice President

SIDNEY GELBER, A.B., M.A., Ph.D.
Academic Vice President

EDMUND D. PELLEGRINO, B.S., M.D.
Vice President for the Health Sciences; Director of the Center; Dean of the School of Medicine

JOSEPH DIANA, A.B.
Vice President for Finance and Management

SHELDON C ACKLEY, A.B., M.A., Ph.D.
Assistant to the President

HERBERT CARLETON, B.A., Ph.D.
Acting Asssociate Dean, Colllege of Engineeering

ROBERT CHASON, A.B., M.A.
Asssistant Vice President and Executive Dean for Student Affairs

ERNEST CHRISTENSEN, A.A., B.S., M.A.
Director of the Stony Brook Union, Administrator, Faculty Student Senate

CLIFFFORD DECKER, B.S.
Director of Physical Plant

DAVID W. D. DICKSON, A.B., A.M., Ph.D.
Assistant to the President

ALAN D. ENTINE, A.B., M.A., Ph.D.
Assistant Academic Vice President for Undergraduate Studies

REX G. FRANCIOTTI, B.S., M.E.
Director of the Computing Center

DANIEL FRISBIE, A.B., Ed.M.
Associate Dean for Admissions

JOHN GAGNON, B.A., Ph.D.
Director, Center for Continuing Education

JOSEPH GANTNER, A.B., M.A., M.L.S.
Acting Director of Libraries

SANFORD M. GERSTEL, B.C.E., M.B.A., P.E.
Budget Director and Assistant Business Manager

JOHN HALPERIN, B.A., M.A., Ph.D.
Director of the Summer Session

JOSEPH HAMEL, B.B.A.
Assistant Vice President for Finance and Management; Businesss Manager

CARL HANES, 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

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

IRWIN KRA, B.S., Ph.D.
Acting Provost, Mathematical Sciences

EDWARD LAMBE, B.Ap.Sc., M.Ap.Sc., Ph.D.
Director of the Instructional Resources Center

JAMFS MCKENNNA, 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

FRANCIS H. PALMER, B.S., M.S., Ph.D.
Provost for Educational Research and Development

ROGER PHELPS, B.S., M.S.
Director, University Housing

MAX B. ROSSSELOT, A.B., A.M.
Dean for Student Administrative Services

RONALD 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

A. FRANK TAMASY, B.A., M.A.
Director of Personnel

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

This faculty listing contains the teaching faculty and their academic positions as of March 15, 1972.

KENNETH T. ABRAMS
Associate Professsor 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

TADATOSHI AKIBA
Lecturer in Mathematics
S.B., M.S., University of Tokyo; Ph.D., Massachusetts Institute of Technology

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 Schoool

JOHN M. ALEXANDER
Professor and Chairman, Department of Chemistry
B.S., Davidson College; Ph.D., Massachusetts Institute of Technology

[a]PER A. ÄLIN
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

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STATE UNIVERSITY OF NEW YORK
GENERAL DESCRIPTION

"The State University of New York—with more than 320,000 students on 70 campuses from Suffolk on Long Island to Fredonia in the west—stands proudly as an institution unparalleled in its development, unique in its diversity and increasingly looked to as a model of what the public university of the future must become."

In this manner, Chancellor Ernest L. Boyer, at his inauguration in April, 1971, described the State University of New York—America's largest university system and, at the age of 23, its youngest.

Since its founding in 1948, the State University has grown from 29 State-supported but uncoordinated campuses into an organized system of higher education comprising 72 institutions which enrolled 207,000 full-time and 114,000 part-time students in academic 1970-71.

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 master's level.

Advanced degree study encompassses a wide spectrum, including agriculture, business administration, criminal justice, dentistry, engineering, forestry, medicine, nursing, optometry, pharmacy and veterinary medicine.

Four-year programs emphasize the liberal arts and science 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 provide transfer programs within the University for students wishing to earn a baccalaureate degree.

Responding to the needs of New York State's economically and educationally disadvantaged citizens, the 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.

Diversity at the State University is further emphasized by its innovative approaches to education. 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 having to enroll in traditional courses. Its coordinating center at Saratoga Springs reaches out to students through regional learning centers which will be opened, eventually, at 20 locations throughout the State. In another approach, Upper Division College, presently located in temporary facilities in Utica, is designed exclusively for junior and senior year students and for those seeking master's degrees.

Ultimately responsible for the decisions which have led to the growth and diversity of the State University is its Board of Trustees. Appointed by the Governor, the Board determines the policies to be followed by all State-supported institutions of higher education, with the exception of the senior colleges of City University of New York. The Board's policies are administered by the Chancellor, the chief executive officer of the University.

While the 38 community colleges have their own local boards of trustees and the State pays only one-third of their operating costs and one-half of their capital costs, these two-year colleges operate under the University program.

It is a program which the Trustees and the Chancellor base on a fundamental principle and one which draws the vast and complex campus system into a single University: the improvement and extension of educational opportunities to citizens throughout the State.

The State University motto asserts that principle: "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

SPECIALIZED COLLEGES

College of Forestry
at Syracuse University
Maritime College
at Fort Schuyler (Bronx)
College of Optometry at New York City

NON-RESIDENTIAL COLLEGE

Empire State College at Saratoga Springs

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 Ilion
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 Niagara Falls
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

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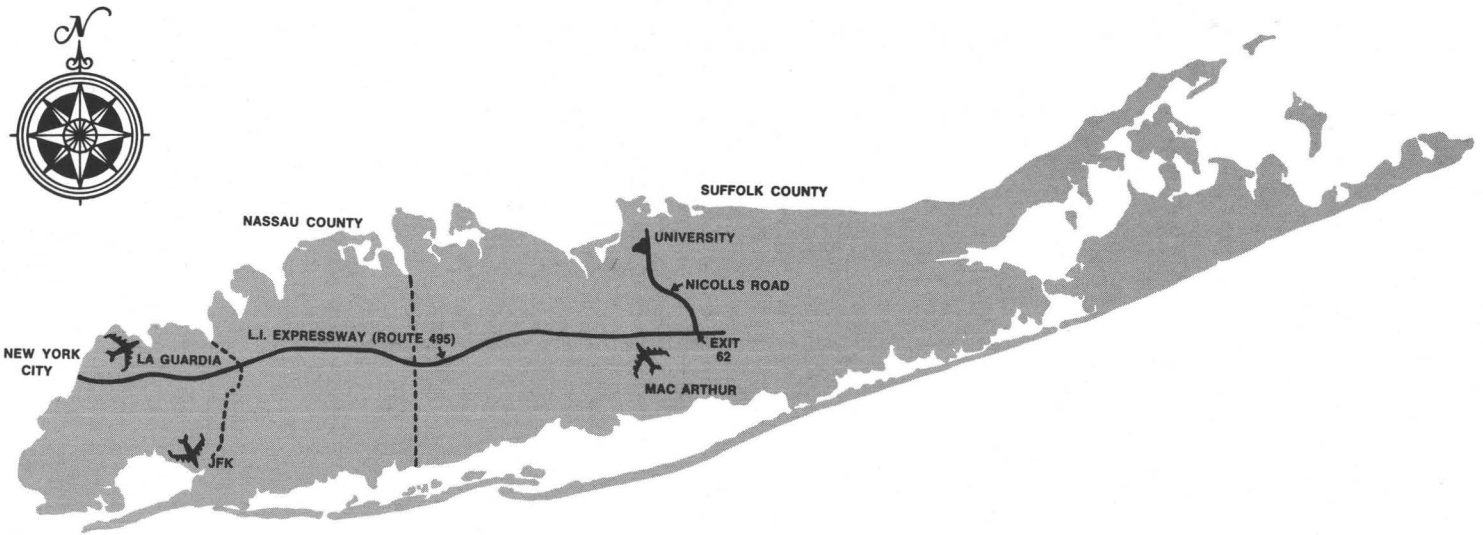
*(During planning and construction of its permanent campus, the Upper Division College offers evening, Saturday and summer courses at a temporary location, 811 Court Street, Utica.)



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

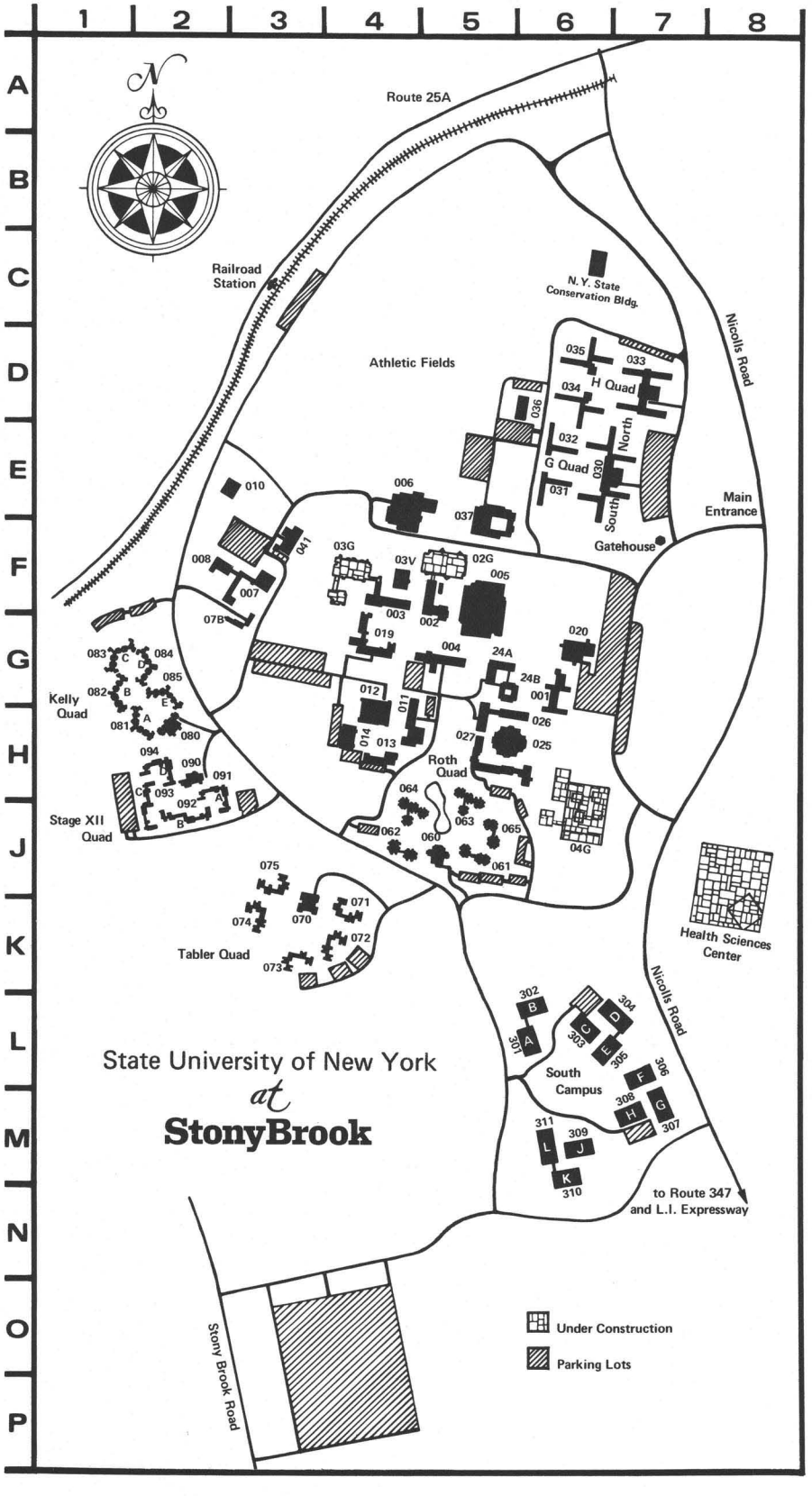
Take the Long Island Expressway (Route 495) east from the Queens-Midtown Tunnel in Manhattan. Leave Expressway at Exit 62 and follow Nicolls Road north for nine miles. Turn left at the main entrance to the University and stop at the gatehouse for a parking permit.

BY RAILROAD

Take the Long Island Railroad's Port Jefferson line from Pennsylvania Station (Manhattan) or Flatbush Avenue Station (Brooklyn), change trains at Jamaica for the 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	E 6
033	Benedict College	D 7
04G	Biological Sciences Graduate Building	J 6
004	Biology Building	G 5
062	Cardozo College	J 4
002	Chemistry Building	F 5
02G	Chemistry Graduate Building	F 5
041	Commissary	F 3
014	Computing Center	H 4
072	Douglass College	K 4
073	Dreiser College	K 3
019	Earth and Space Sciences Building	G 4
010	Electric Sub-Station	E 3
011	Engineering Building	H 4
013	Engineering Heavy Laboratory	H 4
012	Engineering Light Laboratory	G 4
030	G-Cafeteria	E 6
07B	Garage	G 2
	Gatehouse	F 7
065	Gershwin College	J 5
031	Gray College	E 6
006	Gymnasium	E 4
033	H-Cafeteria	D 7
071	Hand College	K 4
	Health Sciences Center	J 8
008	Heating Plant	F 2
063	Henry College	J 5
001	Humanities Building	G 6
036	Infirmary	D 5
026	Instructional Resources Center	H 6
030	(South) Irving College	E 6
034	James College	D 6
080	Kelly Cafeteria	H 2
081	Kelly A—Dewey College	H 1
082	Kelly B—Baruch College	G 1
083	Kelly C—Eisenhower College	G 1
084	Kelly D—LaGuardia College	G 2
085	Kelly E—Hamilton College	G 2
027	Laboratory-Office Building	H 5
035	Langmuir College	D 6
025	Lecture Hall Center	H 6
005	Library, Frank Melville Jr. Memorial	F 5
064	Mount College	H 4
030	(North) O'Neill College	E 6
003	Physics Building	F 4
03G	Physics/Math Graduate Building	F 4
060	Roth Cafeteria	J 5
074	Sanger College	K 3
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	N 6
311	South Campus L	M 6
090	Stage XII Cafeteria	H 2
091	Stage XII A—Stimson College	H 2
092	Stage XII B—Keller College	J 2
093	Stage XII C—Greeley College	J 2
094	Stage XII D—Wagner College	H 2
037	Stony Brook Union	E 5
070	Tabler Cafeteria	K 3
302	Theatre (South Campus B)	M 6
075	Toscanini College	J 3
03V	Van de Graaff Accelerator	F 4
007	Warehouse	G 2
061	Whitman College	J 5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Route 25A
Railroad Station
Athletic Fields
N.Y. State Conservation Bldg.
Nicolls Road
H Quad
G Quad
North
South
Main Entrance
Gatehouse
Kelly Quad
Stage XII Quad
Roth Quad
Tabler Quad
Health Sciences Center
South Campus
to Route 347 and L.I. Expressway
Stony Brook Road
State University of New York
at
StonyBrook
Under Construction
Parking Lots

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