

# 1969-70 Undergraduate Bulletin



STATE UNIVERSITY OF NEW YORK AT

**STONY BROOK**

### **About the Cover**

As man reached the moon, the quest for knowledge that is the very idea of a university received new affirmation. At Stony Brook there was very special interest in the Apollo 11 project. Dr. Oliver A. Schaeffer, Chairman of Stony Brook's Earth and Space Sciences Department, was in Houston with an 11-man team when the first lunar samples were returned, waiting to conduct experiments designed to detect evidence of a lunar atmosphere.

*NASA photograph*



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**STATE UNIVERSITY  
OF NEW YORK  
AT STONY BROOK**

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**COLLEGE OF ARTS AND SCIENCES  
COLLEGE OF ENGINEERING**

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**UNDERGRADUATE BULLETIN  
1969-1970**

**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:  
Area code 516, 246-5000





## ACADEMIC CALENDAR

1969—1970

*Fall Semester 1969*

FOREIGN STUDENT ORIENTATION	September 10-11
FINAL REGISTRATION FOR GRADUATE STUDENTS	September 11-12
NEW STUDENT ORIENTATION FOR UNDERGRADUATES	September 15-16
FINAL REGISTRATION FOR UNDERGRADUATES	September 15-16
CLASSES BEGIN	September 17
ONE-DAY RECESS	September 22
END OF CHANGE OF REGISTRATION PERIOD FOR UNDERGRADUATES	September 30
LAST DAY FOR GRADUATE STUDENTS TO DROP OR ADD A COURSE WITHOUT PENALTY	October 15
LAST DAY FOR REMOVAL OF INCOMPLETES FROM SPRING SEMESTER FOR GRADUATES AND UNDERGRADUATES	November 1
ADVANCE REGISTRATION FOR SPRING SEMESTER FOR GRADUATES AND UNDERGRADUATES	November 10-14
LAST DAY FOR UNDERGRADUATES TO DROP A COURSE WITHOUT PENALTY	November 18
MID-TERM ADVISORY GRADE REPORTS DUE	November 21
THANKSGIVING HOLIDAY	November 26
CLASSES RESUME	(begins at close of classes)
WINTER RECESS	December 1
CLASSES RESUME	December 21
READING AND REVIEW DAYS	January 5
FINAL EXAMINATIONS BEGIN	January 12-13
FINAL EXAMINATIONS END	January 14
	January 24

*Spring Semester 1970*

FINAL REGISTRATION	February 2-3
CLASSES BEGIN	February 4
END OF CHANGE OF REGISTRATION PERIOD FOR UNDERGRADUATES	February 17
LAST DAY FOR GRADUATE STUDENTS TO DROP OR ADD A COURSE WITHOUT PENALTY	March 4
LAST DAY FOR REMOVAL OF INCOMPLETES FROM FALL SEMESTER FOR GRADUATES AND UNDERGRADUATES	March 15
MID-TERM ADVISORY GRADE REPORTS DUE	March 27
SPRING RECESS	March 28
CLASSES RESUME	(begins at close of classes)
LAST DAY FOR UNDERGRADUATES TO DROP A COURSE WITHOUT PENALTY	April 6
ADVANCE REGISTRATION FOR FALL SEMESTER AND SUMMER SESSION FOR GRADUATES AND UNDERGRADUATES	April 10
LAST DAY OF CLASSES	April 13-17
READING AND REVIEW DAYS	May 16
FINAL EXAMINATIONS	May 18-19
MEMORIAL DAY (EXAMS ARE HELD)	May 20-30
COMMENCEMENT	May 30
	June 7

*Summer Session 1970*

REGISTRATION	June 22
CLASSES BEGIN	June 23
CLASSES END	July 31



Lecture Hall  
Melville Memorial Library  
Earth and Space Sciences Building





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## AN INTRODUCTION TO STONY BROOK

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The State University at Stony Brook is one of four university centers of the State University of New York. As a comprehensive university, it is engaged in undergraduate and graduate education in the traditional areas of human inquiry, in the search for new knowledge through research and other scholastic endeavor, and in an expanding role of public service to community, region and state.

While the Stony Brook campus is growing as fast as it can to meet the soaring demand for higher education, its growth is governed by the rate at which the faculty and facilities necessary to maintain high standards can be provided. As prescribed in the Master Plan for the State University, the emphasis is on excellence of program, teaching and student performance.

### History and Location

The University was founded in 1957 at Oyster Bay, Long Island. Its original charter was to become a center for educating secondary school teachers of mathematics and science. In 1960, however, within the context of a fast-growing state university, it was designated a university center and given the mandate to develop undergraduate and graduate programs through the Ph.D. in the humanities, sciences, social sciences and engineering. As a comprehensive university, it was also to become a center for research.

In order to realize its larger goals, the University moved in 1962 to a new and larger campus at Stony Brook, originally consisting of a 480-acre tract of land given to the state for this purpose by Ward Melville. As of fall 1969, there are 39 buildings on the campus, the acreage has more than doubled and the University is engaged in a \$50 million expansion program. The academic program continues to expand at both the undergraduate and graduate levels, the aim being a balanced institution with strength in all areas of the arts and sciences and engineering. In addition, a comprehensive Health Sciences Center is being developed at Stony Brook.

Stony Brook is located in a region of wooded hills and small villages on the north shore of Long Island some 50 miles northeast of New York City and a short distance from Long Island Sound. The Atlantic shore is some 20 miles to the south. Despite its long history and nearness to great centers of population, the area retains a pastoral character with a distinctive New England flavor.

The University thus enjoys the relative seclusion of a semi-rural setting, coupled with proximity to the cultural, scientific and industrial resources of the nation's largest city. The campus is linked to Manhattan by a pattern of four- and six-lane highways and by the Long Island Rail Road (see map at back of *Bulletin*).

### Faculty and Students

As of September 1969, Stony Brook will have 700 faculty members, many of them acknowledged leaders in their fields. Over 80% hold earned doctorates. A complete directory can be found in the back pages of this *Bulletin*.

Most entering students currently come from the top 20% of their high school graduating classes. However, academic standing is only one of a number of factors considered in admitting a new student. The important judgment is whether he is capable of successfully meeting the demands of the academic program.

Enrollment, which totaled 145 students ten years ago, will exceed 8000 in the 1969-70 academic year. This number is expected to approach 10,000 by 1970.

The residential college plan is an important element in this rapidly growing student population. Consisting of individual colleges of 200 to 400 students, with some faculty masters living in the colleges and faculty and graduate associates participating with the students in each college's extracurricular intellectual and cultural programs in the residences, the system is expected to do much to scale the large University down to human proportions which encourage an interchange between students and faculty.

The residential colleges, patterned somewhat after those at leading private universities, each represent an approximate cross-section of the University, including commuter as well as residence students.

### Programs and Accreditations

Academically, all new undergraduate students enter either the College of Arts and Sciences or the College of Engineering.

The College of Arts and Sciences with 19 departments offers bachelor of arts and bachelor of science degrees. The student has a choice of three tracks: the conventional *departmental major* offering concentration in 27 subjects; the *interdisciplinary* or *interdepartmental major* with four areas of study currently available (black studies, elementary education, linguistics and social sciences); and the *liberal arts major*, a plan of study developed by the student to meet his individual interests. Programs leading to provisional certification in elementary and secondary education are also available within each of the three tracks. It is also possible, usually after completion of the general university requirements, to undertake an independent study project. More detailed information on these programs can be found in the College of Arts and Sciences section of this *Bulletin*.

The College of Engineering with four departments—applied analysis, electrical sciences, materials science, and mechanics—grants the bachelor of engineering degree. Programs focus on *engineering science* rather than the tradi-



tional departmental approach (see College of Engineering section).

Currently, graduate work may be pursued in anthropology, biological sciences, chemistry, earth and space sciences, economics, English, history, mathematics, music, physics, psychology, Romance languages (French), sociology, and engineering. The Ph.D. is offered in 15 departments and, by 1970 or 1971, it is expected that graduate programs through the Ph.D. will be offered by all university departments.

The Center for Continuing Education offers the master of arts in liberal studies degree which is an interdisciplinary, non-thesis, 30-credit degree.

There is a six-week summer session which offers undergraduate courses.

Undergraduate correspondence courses are available through the State University of New York at Albany.

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.

### **The Stony Brook Campus**

There are presently 14 large academic structures on the 1000-acre Stony Brook campus providing classroom, lecture hall, laboratory and office space for the divisions, schools or departments they serve. These include the Humanities Building, the Social Sciences Center, the Lecture Hall, buildings for Chemistry, Biology, Earth and Space Sciences and an Engineering quadrangle. The Physics Building accommodates the departments of physics and mathematics. The Nuclear Structure Laboratory, which adjoins the Physics Building, houses the King tandem Van de Graaff accelerator which is used for low energy nuclear research.

Twenty-three two- and three-story residence hall buildings afford living quarters for 5000 students and contain numerous lounges and dining halls. The Gymnasium, with its swimming pool, basketball and squash courts, and rooms for gymnastics and ballet, serves the curricular, intramural and intercollegiate athletic programs. It also supplies space for the Office of Physical Education and the University Theatre. The much-delayed Stony Brook Union, when it opens this year, will provide meeting rooms, recreational facilities including a bowling alley, an auditorium and extensive dining facilities.

The Frank Melville, Jr. Memorial Library, in addition to the customary books, periodicals, microfilm, music collections, and listening and reading facilities, provides temporary quarters for the university administration. The Infirmary Building also performs a dual role, housing the university business offices and admissions.

### Campus Expansion Program

A host of new facilities will be constructed over the next several years. Currently under construction are the Instructional Resources Center, a laboratory-office-classroom building to accommodate the Health Sciences Center during its initial stages of growth, an additional residential college complex to house 1000 students, and an administration building.

Other structures will include a physical science complex to be started this fall, a five-fold expansion of the present library building and a fine arts center, both of which are in the design stage.

It is expected that the Health Sciences Center at Stony Brook will admit its first medical students in 1971. Because of its location near the seashore and its growing strength in the biological sciences, Stony Brook has been designated as the site of the State's Marine Sciences Research Center.





Celebrated visitors to the Stony Brook campus in 1969 have included, from the top, composer Igor Stravinsky, former presidential aide Theodore C. Sorenson, anthropologist Margaret Mead, poet W. H. Auden, Nobel Prize-winning chemist Linus Pauling, and former judge and diplomat Arthur J. Goldberg.



## **Libraries**

The Frank Melville, Jr. Memorial Library, a three-story air-conditioned building, is designed for 350,000 volumes and seating for 700 students. It constitutes the first phase of a larger structure to be completed in 1972 that will house a million volumes at its next stage of development. Four science collections are housed in the science and engineering buildings. In all campus libraries students have free access to the open stacks, with reading areas and bookstacks interspersed. During regular semesters the Melville Library is open until midnight except on Saturday.

A special area houses the files of microfilm, microcards, microprint and microfiche, with reading equipment. Copying machines are available for student use.

As a selective government depository the University Library receives large numbers of publications issued by the United States and New York State governmental agencies. About 5,800 periodicals are currently received and books are being added at the rate of over 100,000 volumes per year. The total library collection now numbers 430,000 volumes and over 100,000 documents.

The library furnishes students with recordings of speeches, poetry and drama, as well as music in the Music Library, which occupies a portion of the first floor of the Melville Library.

## **The Computing Center**

The Computing Center houses an IBM 360 Model 67 computing system with 524,288 bytes of core storage. The IBM 360/67 operates in a multi-programming environment, processing several jobs concurrently. An additional 233.4 million bytes of direct access storage is realized through the IBM 2314 disk storage facility. Seven magnetic tape drives provide data access for low speed-high volume transmissions. During the 1969-70 academic year, additional direct access storage facilities with a total capacity of 554 million bytes of storage will be added in support of a remote terminal system. This system will permit instantaneous communication with the central computer, thereby allowing users and experiments facilitated access to the computer.

The Computing Center Building, completed in 1968, is located in the Engineering Quadrangle.

## STUDENT SERVICES

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Student services—including new student affairs (e.g., admissions, orientation, etc.), residence halls, health services, psychological services, financial aid and part-time employment, general and vocational counseling, job placement, international student advisement and the Stony Brook Union—are administered through the Student Affairs Office. These services are designed to assist the student in relating to, and maximizing the potentiality of, the University. Students are encouraged to seek advice and assistance through the various services. When in doubt about which office is appropriate, the student should go either to the Guidance Services Office or to the central Student Affairs Office located in the Physical Education Building.

### Psychological Services

Psychological Services, through the co-sponsorship of the Student Affairs Office and the Department of Psychology, consists of a staff of trained psychologists and counselors experienced in helping students with personal, social, educational and vocational problems. This service 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.

### Guidance Services Bureau

The Guidance Services Bureau consists of the offices of *Career Development* (Placement), *Commuter Services*, *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 arrive at meaningful plans and decisions. Ordinarily various tests are administered. These instruments provide useful information about the person, such as his aptitudes, interests and personality. Tests are taken, however, only after an interview is held with a counselor to determine the needs of the individual. A more detailed description of services offered by the bureau can be found in the pamphlet *Guidance Services*. A student may seek help on his own initiative or he may be referred by faculty or staff members.

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.

The *Career Development Office* provides seniors, graduate students and alumni assistance in the selection and procurement of career positions. The office coordinates interviews with representatives of various business, governmental and other institutions. Seniors are urged to compile a credentials file which is maintained permanently for their use. Underclassmen are encouraged to consult with staff members about vocational planning.

While commuting students may avail themselves of any services offered by the bureau, the *Commuter Services Office* was established specifically to provide those students not living in residence with general advisement and counseling.

The establishment of the Commuter College will combine efforts of the Commuter Association and the College Program to provide the commuting students with a program of educational, social and cultural events.

With the opening of the Stony Brook Union, commuting students will have office and meeting areas as well as other facilities including eating, study and recreation.

#### **International Student Advisor**

Students from other nations who are studying at the University have available to them the services of an international student advisor. The International Student Office coordinates university services related to the international student, such as orientation, host family program and other community contacts, financial aid, living accommodations and immigration matters. New students should plan to participate in the special orientation program for international students to be held in September, before registration.

#### **University Health Service**

The University Health Service is located on the second floor of the Infirmary Building. The phone number is 5138. Emergency aid is extended to the whole university community. Further assistance is only available to the registered student community. A registered nurse is on duty at the Health Service 24 hours a day, seven days a week, and one or more physicians are on call at all times. After an interview with the nurse on duty, a patient can make an appointment to see one of the university physicians if treatment is necessary.

Aside from its regular clinic, the University Health Service has an allergy clinic, orthopedic clinic and this fall will establish a gynecology clinic and a mental health service, which will give psychological aid for those in need of it. Dental care is available by referral to a local team of dentists. Planned Parenthood Services are available and are provided by the Health Service, which directs the student to proper medical consultation and care. In-bed care can be provided for students with illnesses or injuries requiring short-term supervised bed rest.

## **Housing**

Residence life at Stony Brook is considered to be an integral part of the student's educational experience, offering opportunities for social, intellectual and cultural development. Students live in residential colleges, in which faculty, staff and students work together in the development of programs and traditions. Each college houses students of different classes and varying academic interests. New students are assigned randomly among the colleges, while returning students have an opportunity to choose the college in which they wish to live. The colleges are organized under a system of student self-government. Student governing and planning organizations are advised by faculty and staff, some of whom live in the colleges. Each college has a faculty master and faculty associates. In addition, members of a professional residential counseling staff function at the college, as well as the quad level.

The colleges are arranged in complexes called quadrangles, which normally accommodate a total of approximately 1000 students of both sexes and all classes. Each college accommodates students in double rooms or suites. Provided for each student are a bed, mattress, bureau, study desk and chair, and closet. Each college also contains public lounges, study areas and recreation facilities. All residents of a quadrangle eat in a common dining hall. All resident students subscribe to a board plan which provides 21 meals a week. Snack bar facilities are also available.

The majority of Stony Brook students reside on campus in the residential colleges. Underclassmen may however, under certain circumstances, live in off-campus residences. Students under 21 years of age are required to have parental approval to live off campus and must live in accommodations that meet standards set by the University.

## **New Student Affairs**

The Office for New Student Affairs was established in the fall of 1968 to coordinate university programs concerned with the articulation of secondary schools and community colleges with the University, the identification and encouragement of educational talent and the orientation of new undergraduate students to the University. The Office for New Student Affairs consists of the Admissions Office, Financial Aid Office, International Student Affairs, Special Projects and New Student Orientation.

In addition to the services available directly through its offices and programs, New Student Affairs works with other university agencies (e.g., counselling, academic advisement, health service, housing) in order to promote a sensitivity and understanding of the special needs of new students. In those unusual situations where new students develop difficult individual problems, the Office for New Student Affairs represents an administrative resource for working out solutions.

### **Special Projects**

The Office of Special Projects coordinates student participation in community activities. Many undergraduates serve as counselors in Upward Bound and Wider Horizons, which are programs for low income students in local schools. The office also coordinates a number of tutoring programs in neighboring schools and community centers. In addition, there are opportunities for volunteer work with youth organizations, mental hospitals, etc. Information and applications for the Peace Corps, VISTA and the Teacher Corps are also coordinated through this office.

### **Stony Brook Union**

The Stony Brook Union will be available for full service to the campus for the first time during the fall semester of 1969. The long-awaited building will help meet campus needs by expanding facilities and services as well as providing greater opportunity for programs and activities to enrich the life of the university community.

The Governing Board of the Union whose membership is made up of individuals representing all elements of the university community provides general policy-making leadership. Working from a philosophy dedicated to serving all members as individuals as well as groups, the Union "is committed to responding to the diverse needs and interests of the community in innovative and creative ways."

The Union building itself will provide facilities which include a cafeteria-ballroom, formal dining room and lounge, bookstore, little theatre, post office, meeting and conference rooms, barber shop, beauty parlor, recreation area, radio station, craft shops, photography lab, student activities offices, lounges, bowling alleys, and other special features and services to serve the university community.

### **Athletics**

The university's intercollegiate athletic programs include active participation in organizations such as the Eastern College Athletic Conference, Metropolitan Intercollegiate Athletic Conferences in soccer, squash, swimming and tennis; Collegiate Track Conference in cross country and track and field; Knickerbocker Intercollegiate Athletic Conference in baseball and basketball; National Intercollegiate Squash Racquets Association; Metropolitan Intercollegiate Rowing Association and the Dad Vail Rowing Association.

The intercollegiate program for men consists of: baseball, basketball, bowling, crew, cross country, judo, soccer, squash, swimming, tennis and track. The intercollegiate program for women consists of: archery, badminton, basketball,





bowling, fencing, field hockey, gymnastics, softball, synchronized swimming, tennis and volleyball.

Intramural sports are conducted in many areas for both men and women. The men's intramural program includes the following activities: touch football, soccer, volleyball, basketball, softball, squash, handball, tennis, badminton, table tennis, swimming, cross country, hole in one match, bowling, wrestling and golf. The women's intramural program includes the following activities: badminton, field hockey, bowling, basketball, volleyball, table tennis, swimming, softball, tennis and archery.

## ADMISSION TO THE UNIVERSITY

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State University of New York at Stony Brook considers applications from all men and women regardless of race, creed or national origin, who have demonstrated both academic competence and potential in their prior schooling.

An applicant is admitted only after a careful analysis of the information provided by the high school and other scholastic institutions attended, standardized tests and material supplied by the applicant. In some cases, an interview will be requested for the purpose of clarifying points raised during review of the application.

A strong, broadly-based academic preparatory program is advised for all applicants. A high school diploma (which would normally include four years of English and three years of mathematics) or high school equivalency certificate is required. Since more applications are received than places available for new students, those applicants presenting the strongest preparation, such as three years of foreign language, social studies and sciences, 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 whenever possible. The aforementioned secondary school programs are strongly recommended rather than required, since it is felt that a student may develop academic competence and an intellectual facility in various ways, both within and outside the context of formal instruction.

Recognizing the importance of student diversity, the University is prepared to admit 10-30% of entering undergraduates on the basis of high promise demonstrated by means other than the normal academic criteria. Such criteria as unusual creative ability (e.g., art, music, theatre, dance, etc.), leadership potential and exceptionally strong motivation will be taken into account.

Those students whose backgrounds are characterized by severe environmental and financial limitations may apply for the Advancement on Individual Merit (AIM) Program which is designed to overcome deficiencies of preparation. Students admitted under AIM will be fully matriculated and will be provided supportive services designed to assist in overcoming specific weaknesses. Economic aid, when deemed appropriate by the university Financial Aid Office (see Financial Aid) normally will be in the form of a financial aid "package," (i.e., Economic Opportunity Grant, Scholar Incentive, State University Scholarship, etc.). In cases where the financial burden is less severe, loans and employment also may be utilized. A candidate should contact his school guidance office or the university Admissions Office if he wishes to apply for admission to the AIM program.

### **Application Procedures for New Freshmen**

An application for admission may be obtained by writing to: Admissions Office, State University of New York at Stony Brook, Stony Brook, New York 11790. A pamphlet, *How to Apply for Admission*, giving complete instructions for applying is included with each set of application forms. The candidate is responsible for following the procedure outlined in this pamphlet and for completing the Stony Brook Supplementary Questionnaire; should he not receive all appropriate forms, the Admissions Office should be informed immediately.

While there is no fixed closing date for Fall admission, applicants are strongly urged to file during the Fall and certainly by *January 1* of their senior year. Later applicants risk having action delayed on their applications since a rolling decision system is utilized and available spaces could be committed to the earliest group.

Applications for admission to the Spring semester should be filed by December 15. Because of limited residence facilities, it is uncertain if on-campus housing space will be available for mid-year entrants; those students for whom campus housing is a determining factor should contact the Admissions Office before filing an application.

Since this *Bulletin* goes to press well in advance of the school year, applicants are advised to check with their guidance and/or the Stony Brook Admissions Office for any changes that may have occurred.

### **Interviews**

Although an interview is not required unless requested by the Admissions Office, candidates may request interviews for the purpose of information or clarification at any time. Such discussions generally tend to be of greater usefulness after the applicant's academic record has been filed in the Admissions Office. We also plan to utilize group discussions to a greater degree, since we have found them to be as effective and well received as individual interviews. Additional information regarding group and individual interviews, as well as campus tours, may be obtained by mail or by telephone to the Admissions Office—telephone: 516, 246-5126. We suggest calling this number between 9:00 a.m. and 4:30 p.m., Monday through Friday. Although the Admissions Office is not open on weekends, student guides are usually available on schedule in the reception area on weekends during both the school year and summer session.

### **Transfer Students**

Any applicant who has been registered previously at a degree-granting institution must apply as a transfer student. Each transfer student, in addition to complet-

ing the application procedure outlined for new freshmen, must submit the following from *each* post secondary institution attended:

- A. An official transcript of record.
- B. A personal inventory form.

(If no grades were earned, a statement of attendance and honorable dismissal is required.) An average of "C+" or 2.5 (A=4) is the lowest base considered for admission in most cases. Applicants for the Spring semester should file by December 15. While there is no deadline for Fall, applications will be considered on a rolling basis and students are urged to file as quickly as possible, certainly by April 1. The amount of advanced standing to be granted a transfer student will be determined by a complete evaluation of his record. Ordinarily, only those courses which have been completed at an accredited college or university with a grade of "C" or better will be considered for transfer credit. Award of 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 matriculated study (i.e., two full-time semesters) at Stony Brook. At the time of admission, 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 work at an institution outside of the United States or its possessions, should submit a form for each course taken.) Courses will be evaluated by the department concerned for applicability to major requirements. The Admissions Office evaluates all other courses to determine if general university requirements or elective credit is to be granted. Remedial work, high school equivalents and most technology courses generally will not receive university credit. The amount of transfer credit finally allowed will be entered on the student's official university transcript. Grades earned are not transferable and are not entered on the Stony Brook permanent record. Transfer students will be classified according to the following schedule of semester hours accepted for transfer credit: freshman 0-23, sophomore 24-54, junior 55-84, senior 85 or more. Students in the first or second year of college ordinarily will be expected to supply Fall semester grades in January before a final decision is made.

The University is committed to accepting graduates of the transfer program (i.e., associate of arts, associate of science and associate of applied science in engineering science) from community and agricultural and technical colleges within the State University of New York system. Such students will be given preference if the number of applicants necessitates priority. Graduates of these programs must have a 2.0 or "C" average and the recommendation of the sending college. Graduates of career-oriented programs are advised to consult with an admissions officer to determine the amount of credit to be transferred prior to making a decision to attend if such credit is a significant factor in the student's choice of institution.

**Examinations**

New York State high school seniors are urged to take the Regents Scholarship Examination to fulfill the entrance examination requirement. Those seniors who miss this test and any other students who are applying for admission as freshmen should take the State University Entrance Examination. Information on these examinations is available in the *How to Apply for Admission* booklet which accompanies each application for admission.

Although the Scholastic Aptitude Test (SAT) of the College Entrance Examination Board is not an admission requirement for New York State residents, all applicants who sit for this examination are urged to have the results forwarded to the Admissions Office as a supplement to other scores. Candidates who reside out of state must submit College Board Scholastic Aptitude Test scores. The December examination taken during the senior year is preferred for new freshmen. (Transfer applicants may, with the approval of the Admissions Office, substitute the Scholastic Aptitude Test for the State University Admissions Examination.)

**Notification of Admission**

State University of New York at Stony Brook uses a "rolling decisions" admission system. Notifications are made as soon as possible, in some cases as early as late December. The majority of decisions will be mailed in February and 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 the final record is sent to the Admissions Office. For new freshmen this includes certification of graduation from high school. 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 officer as soon as possible.

**Advanced Placement**

Advanced placement may be extended to freshman students who have completed specified advanced placement courses in secondary school, or who have demonstrated in other ways academic competencies which entitle them to a waiver of certain course requirements. This, however, does not confer semester hour credit toward graduation. Candidates undertaking advanced placement courses in secondary school must take the appropriate CEEB examination and request that



Seated together are University Chancellor Samuel B. Gould (left) and three of Stony Brook's Distinguished Professors: Nobel Laureate C. N. Yang in physics, Bentley Glass in biology and Alfred Kazin in English.

their scores be forwarded to Stony Brook. Normally, a score of "4" on this test is the minimum considered for advanced placement credit. Others desiring advanced placement must submit written requests for reviews of their qualifications; in most cases, special examinations will be required.

#### **Preadmission Deposit and Refund Policy**

Each new student is required to pay an advance tuition deposit of \$50 and a \$25 deposit in order to request housing. These deposits, payable upon tentative or conditional acceptance, are applied against charges incurred by the student in the first semester.

Refunds will be granted according to the following conditions: if a student is admitted prior to April 1, the written request must be received in the Admissions Office by May 1; if a student is admitted after April 1, the written request must be received in the Admissions Office within 30 days of the offer of admission.



## FINANCIAL INFORMATION

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Tuition and fee costs are based on the schedule printed below. All charges are due and payable on the first day of the semester.

CHARGE OR FEE	FIRST SEMESTER	SECOND SEMESTER	YEAR
<i>Tuition</i>			
Undergraduate (N.Y. State Resident)	\$200.00	\$200.00	\$400.00
Undergraduate (Out-of-State Resident)	300.00	300.00	600.00
Graduate Student	300.00	300.00	600.00
Special Graduate Student Part Time per cr.	20.00	20.00	
Special Undergraduate Student (N.Y. State Resident) per cr.	13.50	13.50	
Special Undergraduate Student (Out-of-State Resident) per cr.	20.00	20.00	
<i>College Fee</i>			
Undergraduate and Graduate	12.50	12.50	25.00
Special Graduate Student Part Time per cr.	.85	.85	
Special Undergraduate Student per cr.	.85	.85	

	FIRST SEMESTER	SECOND SEMESTER	YEAR
<i>Student Health Insurance Fee</i> <sup>a</sup>			
Individual	\$33.00		\$33.00
Student & Spouse	72.00		72.00
Student, Spouse & Dependent Child or Children	120.00		120.00
<i>Student Activity Fee</i> <sup>b</sup>			
(Undergraduate)	70.00		70.00
<i>Identification Card</i>			
(On admission or re-admission)	2.00		
<i>General University Deposit</i> <sup>c</sup>			
Commuting Student	20.00		20.00
Resident Student	35.00		35.00
<i>Orientation</i> <sup>d</sup>			
(Freshmen only)	25.00		25.00
<i>Graduation</i> <sup>e</sup>			
	15.00		15.00
<i>Room (Includes basic telephone rental charge)</i>			
Double Occupancy	282.50	282.50	565.00
<i>Board</i> <sup>f</sup>			
21 Meal Plan	225.00	225.00	450.00

<sup>a</sup> Student health insurance fee waived if proof of both hospital and medical insurance is presented prior to registration. Insurance period covers one year beginning September 17.

<sup>b</sup> To be collected by Student Polity.

<sup>c</sup> To be charged for any damages to property, unpaid telephone charges, unpaid library fines and other charges due.

<sup>d</sup> Includes orientation fees and charges for room and board.

<sup>e</sup> Required in the year that the candidate will receive his baccalaureate, masters or doctoral degree.

<sup>f</sup> This fee includes the food service contractor charge and special allocations set aside for residential college programs, for student affairs programs and for maintenance and replacement costs.

A statement of all charges will be sent to the student at the beginning of the academic year, or upon his admittance. This statement contains a complete schedule of all charges, along with due dates for payment. It will be the responsibility of the student to see that all obligations are paid promptly. Complete-instructions accompany each schedule.

Students who register after the official registration period must pay a late registration fee of \$15.

The above fees are subject to change without notice.

The University reserves the right to cancel the registration of any student who fails to meet his obligations at the University. It will be the responsibility of each student to arrange a meeting with the financial aid officer if circumstances preclude the paying of expenses when due.

### Refunds

Request for refund must be made in writing to the Business Office. 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:

LIABILITY DURING	SCHEDULE OF TUITION LIABILITY	
	SEMESTER	6 WEEK TERM (SUMMER SESSION)
1st Week	0	0
2nd Week	30%	70%
3rd Week	50%	100%
4th Week	70%	
5th Week	100%	

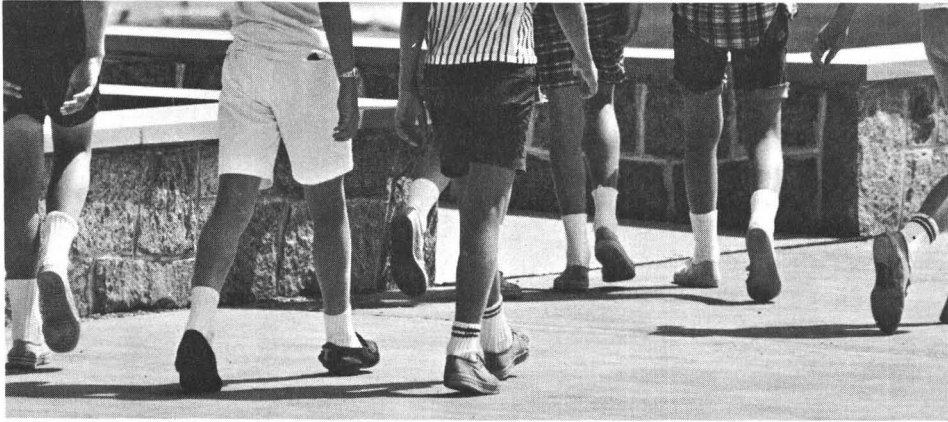
Note: It is interpreted that a student who does not attend any class sessions after Saturday of the first week and who notifies the college on his intent to cancel registration on or before the second Saturday following the first day of classes shall be deemed to have cancelled his registration during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

*College fee is non-refundable.*



*Withdrawal from the meal plan for medical reasons* with the approval of the director of student health service takes effect on the Monday following withdrawal and refunds will be computed on this basis.

#### **Residence Charges**

Room charges for an academic year are listed in the preceding schedule. Once a student has registered and occupied a room, no refund will be granted for payment made for that quarter. An advance room deposit of \$25 is required of all resident students prior to each fall semester. This amount will be credited to the student's room account. The advance room deposit is refundable if application is made in writing before July 1.

Students living in the residence halls must pay for board as stated in the schedule. Payments are refundable on a percentage basis, after official notification has been received by the Business Office. No refunds are made to students who leave the campus on weekends, nor are refunds made to any student who, for any other reason, misses meals.

Laundry service is provided at nominal cost. Coin operated washing machines and dryers are available in the residence halls.

Each room is provided with a private telephone. A general university deposit of \$35 is required of resident students.

#### **Summer Session**

Expenses for the 1969 summer session are as follows:

##### *Tuition*

Undergraduate level course (N.Y. State Resident)	\$13.50 per credit hour
Undergraduate level course (Out-of-State Resident)	\$20.00 per credit hour
Graduate level course	\$20.00 per credit hour

<i>* General University Deposit</i>	
Commuting Student	\$20.00
Resident Student	\$35.00
<i>Student Services Fee</i>	\$5.00
<i>** Student Health Insurance (Summer Session Only)</i>	
<i>Room (Includes basic telephone rental charge)</i>	\$3.00
Double Occupancy	\$15.00 per week
Single Occupancy	\$20.00 per week

*Board: A la carte*

### **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 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 during the early spring and should be submitted prior to June 1 for first consideration. Most financial aid awards are made during the summer months.

### **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. Persons achieving a certain minimum score, but not enough for a scholarship, receive Scholar Incentive Awards. 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 \$100 to \$200 per year at Stony Brook where yearly tuition is \$400. Applications must be obtained directly from the State Education Department, Regents Examination and Scholarship Center, 800 North Pearl Street, Albany, New York 12204.

\*Applies to all students except those registered in the previous spring semester who have an outstanding deposit.

\*\*Student health insurance fee waived if proof of both hospital and medical insurance is presented prior to registration. Not required of students already enrolled in regular health insurance plan at Stony Brook.

### 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 \$1800 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 "who would not otherwise have the means to attend college." 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. The chart below shows general guidelines but is *not* the sole determinant for eligibility.

Number of children in family	"Adjusted gross income" must be less than
1	\$5300
2	6200
3	7300
4	8200
5	9000
6	9600

### 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 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 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 3% 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.

**Part-Time Work and the 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 pay-

ments of \$130 per month to single veterans who are in full-time study. Veterans with one dependent may receive \$155 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**

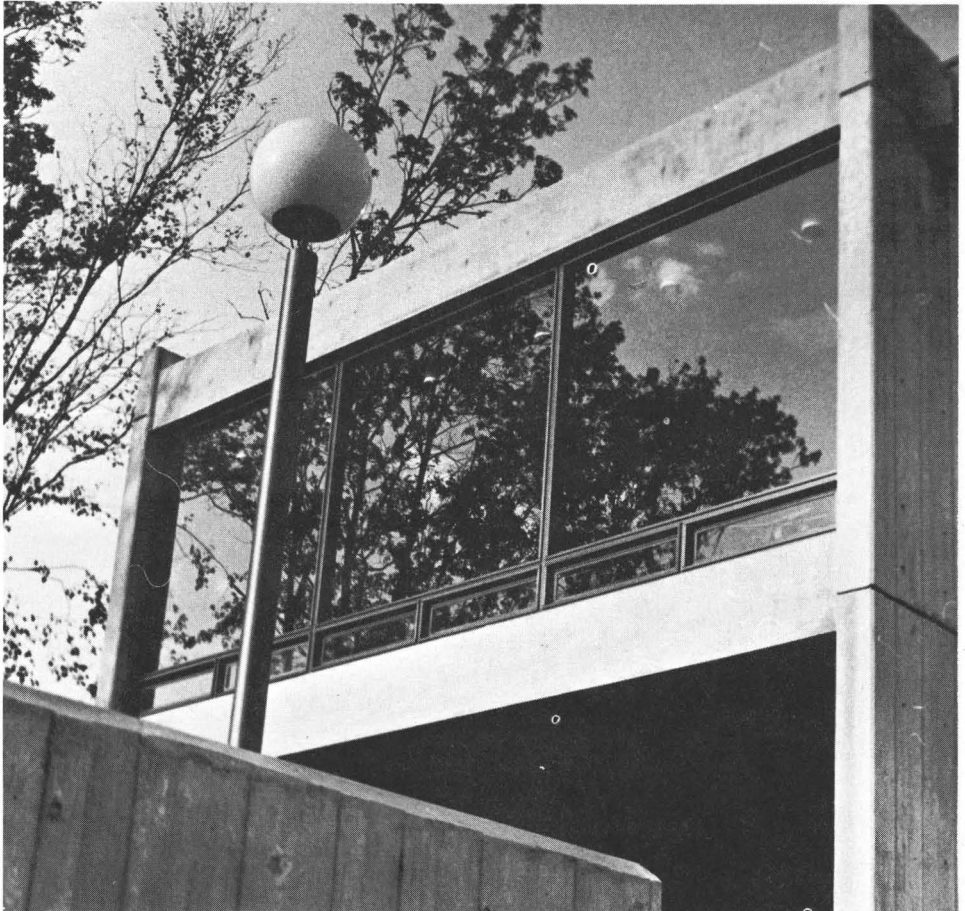
As Stony Brook becomes established and its reputation grows, an increasing number of scholarships are expected to become available through the generosity of private donors or foundations. Several, granted within the previous year, are listed below:

- A. *The Kaltenborn Foundation* offers two \$1000 scholarships annually, one each to outstanding juniors in the fields of music and art. 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 and Art.
- 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 four Stony Brook students during the 1969-70 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. A scholarship of \$500 has been made available by Miss Helen Strauss for an outstanding student in theatre arts.
- D. As a result of a grant by Irving Langmuir College at the State University of New York at Stony Brook, \$1000 in scholarships will be awarded to selected undergraduate students during the 1969-70 aca-

ademic year. Consideration for these awards will be based on financial need. Applications are available at the Financial Aid Office.

#### **Foreign Student Tuition Scholarships**

State University of New York is able to award a limited number of tuition scholarships to students from other countries who are in the United States for a temporary period of study. The scholarships are awarded primarily on the basis of financial need. Non-citizens who hold permanent resident visas are normally not eligible for consideration. The tuition scholarship is equivalent to \$600 per academic year and may be renewed by making a new application each year the student continues full-time enrollment at Stony Brook.



## ACADEMIC REGULATIONS AND PROCEDURES

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### Registration

Completion of registration each semester in accordance with instructions issued by the registrar 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 September 10 for the fall semester, or January 20 for the spring semester should contact the Office of the Registrar without delay.

Registration after the close of the announced final registration period in the academic calendar requires the payment of a service charge of \$15. Registration is not permitted after the end of the second week of classes. A student is not considered registered until the appropriate forms have been filed with the registrar and arrangements regarding tuition and fees have been made with the Business Office.

### Course Selection

Courses are to be chosen in accordance with the regulations of an established degree program and are to be approved by the student's academic advisor. It is the student's responsibility, however, to plan his program so that all degree requirements are met.

### Course Load

A student may register for 12-19 hours of credit each semester with the approval of his academic advisor. Normally a student will register for a course load of 15-18 credit hours.

A student who wishes to register for less than 12 or more than 19 hours must petition the Committee on Academic Standing on forms provided by the registrar. Petitions to take course work in excess of 19 semester hours will normally be approved only if the student has achieved a grade-point average of 3.00 or better during each of the previous two semesters. Petitions to take less than 12 hours of work will normally be approved only when, in the judgment of the committee, unusual circumstances, such as physical disability, exist. Such petitions should be accompanied by appropriate documentation.

**Pass-Fail Option**

In September 1967 an experimental pass-fail grading system was introduced on a limited basis to permit sophomores, juniors and seniors to explore various areas of the curriculum with less immediate pressure for grades. Within the limitations given below students are free to elect courses on a pass-fail basis as they see fit. Questions about the applicability of the pass-fail option to individual situations should be discussed with the student's faculty advisor.

- A. No courses may be taken on a pass-fail basis during the freshman year.
- B. No more than four courses may be taken on a pass-fail basis during a student's university residence.
- C. No more than one such course may be taken in any semester.
- D. All such courses must be taken outside the student's departmental major requirements.
- E. In calculating grade-point averages, "pass" shall not be used in the calculation and "fail" shall be used.
- F. A student must designate a course for the pass-fail option at registration or during the first two weeks of the semester, and he may not thereafter change this designation.
- G. In the event that a student's change of major or a department's alteration of its major requirements should affect a pass-fail course already taken, the department shall accept the student's "pass" but may require an additional examination.

**Change of Registration**

A student may change his registration only during the first two weeks of the semester. To do so he must first complete the appropriate request form and then obtain the approval of his advisor for the proposed change. Forms for this purpose are available from the registrar. No record is made of courses dropped during this period.

After the second week of classes, no course may be added. A student may, however, drop a course through the ninth week of the semester provided he has the approval of his academic advisor and the change does not reduce his course load below 12 semester hours. Students will be assigned the grade of WP (withdrawn passing) or WF (withdrawn failing) for each course dropped. After the ninth week, no course may be dropped.

**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 to regularly enrolled students.

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.

### **Assignment of Grades**

In each course final grades are given at the end of the semester, except in year-long courses designated by a dash. In such courses an R grade is given at the end of the first semester and a final letter grade only after both semesters have been completed.

Grades assigned at the completion of a course are as follows: A (superior), B (good), C (satisfactory), D (minimum passing), F (failure). In addition, the following marks may be awarded at the end of the semester:

I (incomplete) may be given at the discretion of the instructor when a student fails to complete all course requirements *due to circumstances beyond his control*. The date set for the completion of such requirements will ordinarily be no later than November 1 for courses taken in the prior spring semester and March 15 for courses taken in the prior fall semester. If a final letter grade of A, B, C or D is not reported to the registrar by these specified dates, the grade of I will automatically be changed to F. No student will be permitted to graduate with the grade of I on his record. Under unusual circumstances an instructor may extend the period for completing the course requirements. In such cases the instructor must notify the registrar in writing before the I expires and specify the date upon which an alternate final grade will be reported. If a grade of A, B, C or D is not reported to the registrar by this date, the grade of I will be automatically changed to F.

WP (withdrawn passing) indicates withdrawal from a course while the student is doing passing work or before evaluation is possible.

WF (withdrawn failing) indicates withdrawal from a course while the student is doing failing work.

R (registered) indicates attendance during the first semester in a year-long course, the final grade for which will be assigned only after the completion of two semesters.

P (pass) indicates passing work in a course where the evaluation standard is either pass or fail.

S (satisfactory), U (unsatisfactory) and H (honors) indicate evaluation of academic performance in a tutorial or other kinds of special courses.

### **Grade-Point Average**

For the purpose of determining grade-point averages, letter grades have the following values: A-4 points, B-3 points, C-2 points, D-1 point and F-no points.



Grades of I, WP, WF, R, P, H, S and U are not included in the grade-point average. To compute the cumulative grade-point average, the number of points equivalent to the letter grade earned in a given course is multiplied by the number of semester hours for that course; the total number of points earned in all courses is then divided by the total number of semester hours for which the student has been registered. Only courses taken at Stony Brook are included in a student's grade-point average.

### **Repeating Courses**

With the approval of his advisor, a student may repeat a course in which he has received a grade of D or F. All grades and semester hours will be computed in the grade-point average, but a course which has been passed may be counted only once in satisfying credit hour requirements.

### **Academic Standing**

During the freshman and sophomore years (or the first four semesters of registration) a student must earn a grade-point average of at least 1.75 each semester to remain in good standing. Students earning a grade-point average below 1.75 during any semester will be placed on academic probation for the following semester.

During the junior and senior years (or after four semesters of registration) students must earn a grade-point average of at least 2.00 each semester to remain in good standing. A cumulative grade-point average of 2.00 for all work undertaken after entrance into the junior year (or begun after four semesters of registration) is required for graduation. Upperclassmen earning a grade-point average of under 2.00 during any semester will be placed on academic probation for the following semester.

Students on probation whose grade-point average for the probationary semester is less than 1.75 for a freshman or sophomore, or less than 2.00 for an upperclassman, will be suspended. Students who are placed on probation for a third time or those who in any semester receive more failing than passing grades will be eligible for suspension, as will those already registered if during the semester the change of an I to a letter grade places them below the level required for good standing.

### **Classification of Students**

For the purpose of interpreting academic regulations, students will be placed in class according to the following schedule of semester hours completed for degree credit: freshman 0-23, sophomore 24-54, junior 55-84, senior 85 or more.

**Dean's List**

Students who have registered for 12 or more semester hours exclusive of any pass-fail courses who achieve a grade-point average of at least 3.00 during the semester (calculated after any grades of I have been made up), and who have not failed a course, will be placed on the Dean's List.

**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 at his home address, usually within one week of the end of the final examination period.

**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 the Registrar at least ten days 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 Business Office and the receipt submitted to the registrar 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 registrar.

Official transcripts of work taken at other institutions which have been presented for admission or evaluation of credit become the property of the University and cannot be copied or reissued. If a transcript of this work is needed it should be obtained directly from the institution concerned.

The University reserves the right to withhold issuance of a transcript for any student who has failed to meet his financial obligations at the University.

**Residence**

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.

**Taking Summer Courses Elsewhere**

A currently enrolled Stony Brook student who wishes to take a summer course at some other institution for transfer credit to Stony Brook must obtain the advanced approval of both his faculty advisor and a Stony Brook admissions officer before doing so. Upon completion of the course with a grade of C or better and submission of an official transcript to the Stony Brook Admissions Office, appropriate transfer credit will be allowed.

**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 the Registrar. The date upon which this form is filed, and not the date of the last class attendance, is considered the official date of withdrawal. Non-attendance or notification to the instructors does not constitute formal withdrawal.

Students who officially withdraw on or before the day of the last class meeting prior to final examinations will receive the grade of WP or WF for each course in which they are registered. Students who terminate their attendance at the University without filing formal notification of withdrawal on the appropriate form will be automatically assigned the grade of I in each course for which they are registered.

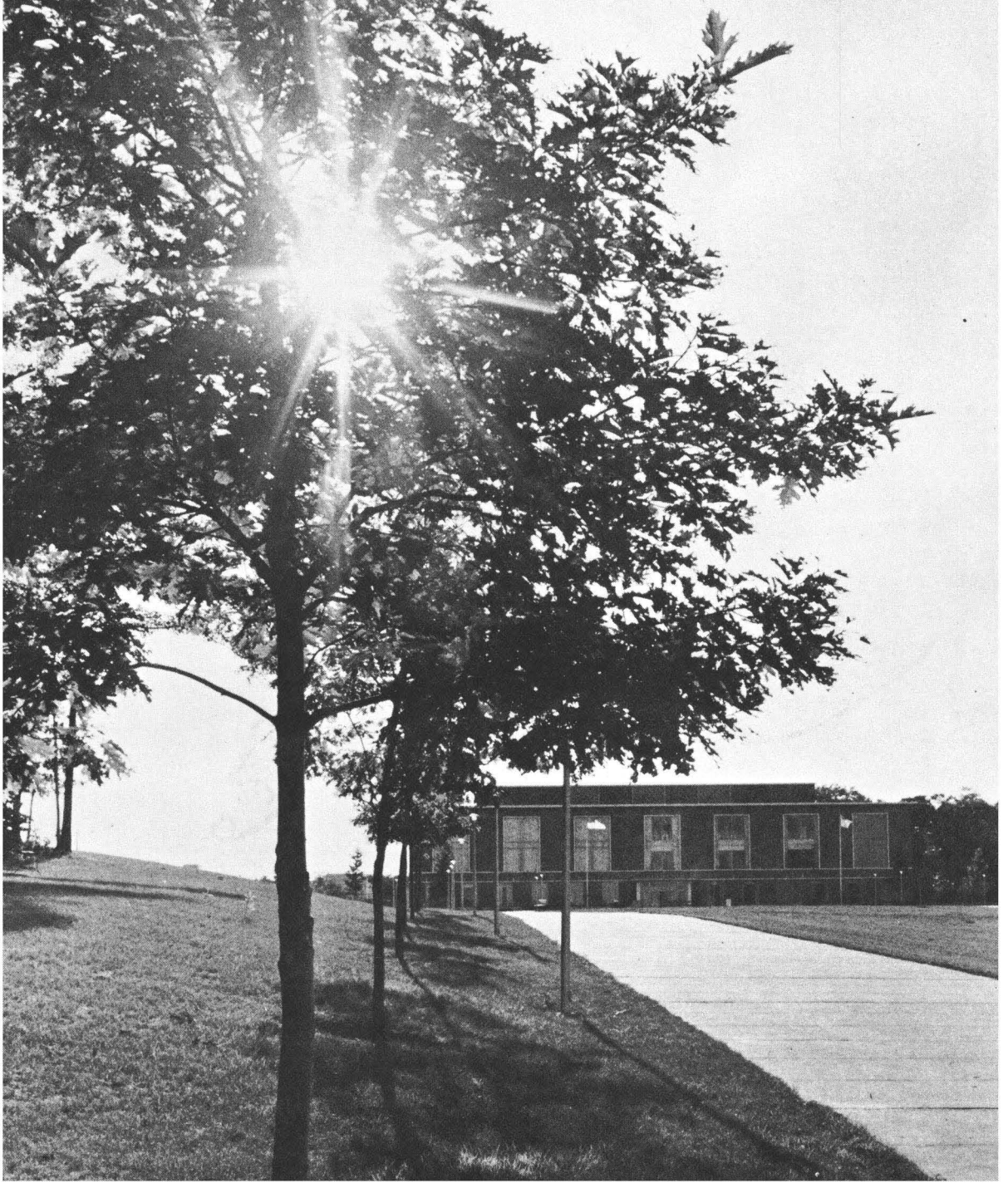
**Readmission to the University**

Students who have withdrawn or been suspended and who wish to be readmitted must apply for readmission through the Office of Admissions. In view of the increasing enrollment pressures, applications for readmission should be filed at least one month prior to the semester for which readmission is desired. If the student has attended another institution since leaving Stony Brook, an official transcript must be submitted before his application will be considered. In the case of students who have been suspended, at least one semester must elapse before they will be considered for readmission. A student who has been suspended twice is not eligible for readmission.

**Changes in Regulations and Offerings**

The University reserves the right to change academic regulations or to cancel any course for whatever reasons it may deem appropriate.





## COLLEGE OF ARTS AND SCIENCES

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### Degree Requirements

All candidates for the bachelor of arts or bachelor of science degree must satisfy the following requirements, normally by attaining a passing grade in appropriate courses and exceptionally by being granted exemption, in which case no course credits are given:

**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**

Two semester courses, to be chosen from among the offerings of the following departments: biological sciences, chemistry, earth and space sciences, mathematics and physics. . . . . 6-8 credits

**C. Social and Behavioral Sciences**

Two semester courses, to be chosen from among the offerings of the following departments: anthropology, economics, education, history, political science, psychology and sociology. (Student teaching courses may not be used to satisfy this requirement.) . . . . . 6-8 credits

**D. Arts and Humanities**

Two semester courses, to be chosen from among the offerings of the following departments: art, English, Germanic and Slavic languages, music, philosophy, Romance languages and theatre arts. Also acceptable are certain courses in other foreign languages and all courses in linguistics and world literature. . . . . 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.
2. Music: MUS 114, 115, 116, 151, as well as the first two semesters of MUS 161-199 and MUS 261-299.
3. English and theatre arts: courses in composition, EGL 101 and 105, and diction, THR 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.

F. 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 at the earliest possible time, normally within the first 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.

### **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 newly authorized 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 1969, four interdisciplinary programs have been approved: Black Studies, Elementary Education, Linguistics and Social Sciences. They are described in more detail in this section of the *Bulletin* under these four individual program headings. Additional interdisciplinary programs are currently being considered,

as well as additional courses within programs which have already been established. For further information consult the Office of the Vice President for Liberal Studies.

### **III. The Liberal Arts Major**

This is a new program designed to lead to the baccalaureate degree by means of a plan of study developed by the student to meet his individual interests. A faculty board of advisors will help the student in planning his 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. For further information consult the Office of the Vice President for Liberal Studies.

### **IV. Independent Study Projects**

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 his study project, indicating its scope and purpose and the methods which will be used to conduct it. He must then obtain from two faculty members written approval of the project and agreement to supervise it and to recommend appropriate academic credit. If independent study is undertaken as part of a departmental or interdisciplinary major, one of the faculty signers must be the chairman of the department or program. The completed dossier—project outline and endorsements—is then submitted by the sponsoring faculty member to the appropriate college curriculum committee for review. 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.

### **ELEMENTARY AND SECONDARY TEACHER CERTIFICATION PROGRAMS**

The programs described below are designed to prepare students to meet New York State requirements for provisional teacher certification. They are being submitted to the New York State Education Department for registration and approval, and are supervised locally by the committee on teacher preparation which is chaired by the director of teacher preparation. Questions concerning

the teacher certification programs should be addressed to the director of teacher preparation, Dr. Mortimer Kreuter.

### Elementary School Teacher Certification

Students seeking provisional certification to teach in New York State elementary school may, when ready to choose a major program, enroll in the newly established interdisciplinary program, elementary education (ELD). This program has two tracks or options. Option N-6 leads to provisional New York State certification to teach in grades N-6. Option N-9 leads to provisional New York State certification to teach in grades N-9 and an academic subject in the early secondary grades.

#### *Option N-6*

##### I. General Distribution

	<i>Credits</i>
A. Natural Sciences	
1. BIO 101 or an equivalent course recommended by the Biology Department .....	3-(4)
2. One semester course in the physical sciences (chemistry, or earth and space science, or physics) .....	3-(4)
3. Two semester courses in mathematics (MAT 105, 107 and 108 are recommended) .....	6
B. Social and Behavioral Sciences	
12 credits chosen among the departmental offerings in anthropology, economics, history, political science, psychology, sociology .....	12
C. Arts and Humanities	
12 credits chosen from among the departmental offerings in art, music, philosophy, English, foreign languages, and courses in humanities, literature and linguistics .....	12
D. EGL 101 .....	3
A course in linguistics .....	3
Total: (These courses may be counted toward satisfaction of the general university program) .....	42 (44)

##### II. Professional Study in Education

###### A. Education

21 credits in education selected with the approval of the student's advisor plus a 3-credit student teaching seminar (EDU 355) which is a corequisite for student

teaching. Courses in materials and methods of teaching offered in other departments than the Education Department may be included, upon approval of the student's advisors ..... 24 (21+3)

B. Student Teaching

A one-semester supervised full-time student teaching experience at the elementary school level (EDU 352). 12

*Total* 36

III. General Electives

Elective courses selected with the approval of the student's advisor. .... 40-42

*Total of I, II, and III* 120

Required Physical Education Program No Credit

*Option N-9*

Option N-9 is for students seeking a certificate valid for teaching in the early childhood, upper elementary grades and an academic subject in the early secondary grades (provisional New York State certification, grades N-9).

The requirements for Option N-9 are similar to those for Option N-6 with the difference that in Option N-9 college study shall include the academic concentration for which the certificate is issued:

English	30 credits
Foreign Language	24 credits
Mathematics	18 credits
Social Studies	30 credits
General Science *	36 credits

*Note:* Only students completing the university elementary certification program, whether declared ELD majors or not, will be recommended for certification by Stony Brook. However, students completing the minimum requirements established by the New York State Department of Education may, after graduation, file a direct application to the State Education Department for provisional certification.

The specific courses to be required for satisfaction of the academic concentration requirements for Option N-9 will be designated and published by the Committee on Teacher Preparation.

\* This total must include collegiate level study in at least two sciences: biology, chemistry, earth science, physics.

**Secondary School Teacher Certification**

In addition to the general university requirements for a baccalaureate degree, the following are required in the university secondary teacher certification program.

I. General University Program (Summary)	<i>Credits</i>
A. Natural Sciences	6-8
B. Social and Behavioral Sciences	6-8
C. Arts and Humanities	6-8
D. English Composition (EGL 101)	3
E. Physical Education (two semesters)	

*Total 21-27*

*Note:* For detailed description of requirements, see statement of the general university program.

II. Professional Study in Education	
A. Education	
9 credits in education selected with the approval of a member of the Department of Education plus a 3 credit student teaching seminar (EDU 354) which is a corequisite for student teaching	12 (9+3)
B. Student Teaching	
A one-semester supervised full-time student teaching experience at the secondary school level (EDU 350)	12

*Total 24*

**III. Degree Program**

Candidates for secondary teacher certification may elect any of the approved degree programs, departmental major, interdisciplinary program, or liberal arts major. In each case, students should note that regardless of the major, the State Education Department has established minimum credit requirements for certification in the various academic subjects.

These are as follows:

English	36 credits
Foreign Language	24 credits
Mathematics	18 credits
Social Studies	36 credits
Science *	36 credits

\* Note: The State requires that a minimum of 15 semester hours be completed in courses in each science for which certification is sought (biology, chemistry, earth science, physics). Certification for teaching general science will be given when the total shows collegiate level study in at least two sciences (biology, chemistry, earth science, physics).

It is not necessary to major in a department, (e.g., English) in order to obtain certification to teach the respective academic subject (e.g., English). Specific courses that will be required for the satisfaction of the concentration requirements will be designated and published by the committee on teacher preparation.

*Total* of I, II, and III (plus electives) 120 credits

Required Physical Education Program No Credit

*Note:* Only students completing the university secondary certification program will be recommended for certification by Stony Brook. However, students completing minimum requirements established by the New York State Department of Education can, after graduation, file a direct application to the State Education Department for provisional certification.



## DEPARTMENT OF ANTHROPOLOGY

*Professors:* PEDRO ARMILLAS, PAULA BROWN, PEDRO CARRASCO, LOUIS C. FARON  
(*Chairman*)

*Associate Professor:* ROBERT STEVENSON

*Assistant Professors:* DAVID HICKS, STANLEY REGELSON, MARGARET C. WHEELER

*Instructors:* DOLORES NEWTON, ROGER PERANIO

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 suitable to specialization in a graduate program in anthropology. The curriculum emphasizes the fields of cultural and social 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 and 150 (*Introduction to Social and Cultural Anthropology, Elementary Social Structures*)
- \* 2. Two ethnographic area courses, such as *Peoples of Africa, Peoples of South America, North American Indians*, etc.
- \* 3. Two topical courses, such as *Comparative Religious Systems, Political Anthropology, Social and Cultural Change*, etc.
4. One 300 level course
5. Three elective credits to be taken from categories 2, 3 or 4 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.

## 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.

Mr. D. Hicks, Mr. R. Peranio  
*Fall and Spring, 3 credits*

\*Consult advisor if in doubt about the difference between ethnographic area and topical courses.

### **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 primates, (2) physical and cultural characteristics of the Pleistocene hominids, with the relevant pre-historic archaeology, (3) a brief survey of a group of living hunters, e.g., Eskimos, Australian Bushmen. Current research on human origins, genetics, evolution, race and primate and human ethnology will be discussed.

Mr. S. Regelson, Mrs. M. Wheeler

*Fall and Spring, 3 credits*

### **ANT 150 Elementary Social Structures**

Detailed structural-functional analysis of basic organizing principles and institutions among a selected range of simpler societies of the world.

Prerequisite: ANT 102 or permission of instructor.

Mr. R. Peranio

*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 sociocultural 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 150 or permission of instructor.

Mr. D. Hicks

*Fall, 3 credits*

### **ANT 202 Cultures and Cultural History of Tropical Lowland South America**

This course will survey the cultures of the Amazon-Orinoco drainages with emphasis on those of Brazil. The comparative method will be employed as the principal means of elucidating the cultural history of particular

groups as well as general regions where documentation is lacking. Along with ethnological analysis, certain aspects and problems in lowland prehistory will be considered from an archaeological perspective.

Prerequisite: ANT 201 or permission of instructor.

Miss D. Newton

*Spring, 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 150 or permission of instructor.

Miss D. Newton

*Fall, 3 credits*

### **ANT 204 Peoples of Africa**

The range and distribution of African populations, languages and sociocultural 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 sociocultural 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 150 or permission of instructor.

Mr. R. Stevenson

*Spring, 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 of India and China.

Prerequisite: ANT 150 or permission of instructor.

Mr. R. Stevenson

*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 150 or permission of instructor.

Mr. P. Carrasco

*Fall, 3 credits*

### **ANT 209 Ancient Civilizations of Middle America**

The pre-Spanish civilizations of Mexico and Central America. Archaeological background and traditional history. Ecological adaptation, economic systems, social and political institutions, religious and intellectual achievements. Prerequisite: ANT 150 or permission of instructor.

Mr. P. Carrasco

*Fall, 3 credits*

### **ANT 211 Peoples of Southeast Asia**

Ethnographic, ethnological and structural-functional analysis of selected tribal and peasant societies of mainland Southeast Asia and Indonesia-Malaysia. An attempt will be made to arrange the societies along a scale of progressive sociocultural complexity, presenting societies representative of each level, and showing some of their important interrelationships.

Prerequisite: ANT 150 or permission of instructor.

Mr. R. Peranio

*Fall, 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.

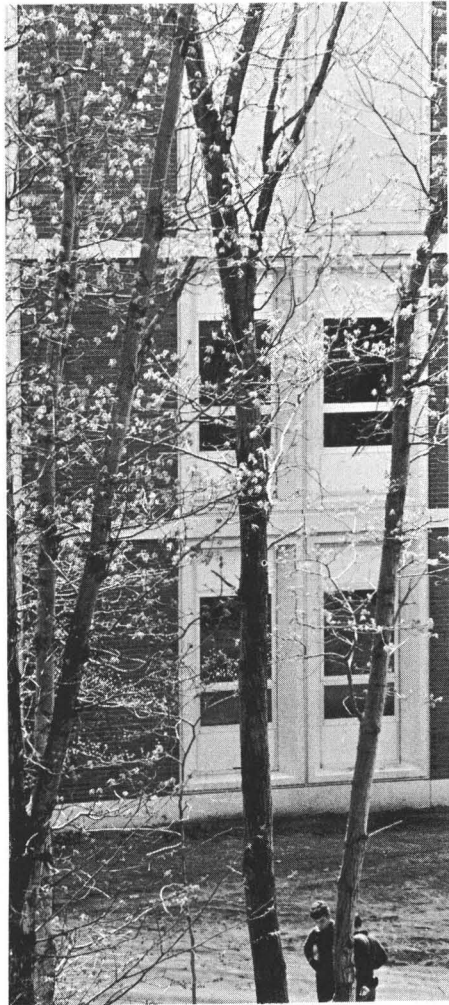
Prerequisite: ANT 150 or permission of instructor.

Mrs. P. Brown

*Spring, 3 credits*

### **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 150 or permission of instructor.

Mr. R. Stevenson

*Fall, 3 credits*

### **ANT 215 Social Structure in Lowland South America**

Modes of social and symbolic classification in selected tribal societies of lowland South America with particular reference to the Ge speaking peoples of Brazil. Varying theoretical interpretations of particular social structures will be discussed and evaluated within an ethnographic framework.

Prerequisite: ANT 150 or permission of instructor.

Mr. D. Hicks

*Spring, 3 credits*

### **ANT 250 Economic Anthropology**

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

Prerequisite: ANT 150 or permission of instructor.

Mr. P. Carrasco

*Spring, 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 150 or permission of instructor.

Mrs. M. Wheeler

*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 150 or permission of instructor.

Mr. R. Peranio

*Fall (every other year), 3 credits. Not offered 1969-70*

### **ANT 253 Political Anthropology**

Description and analysis of political institutions among the simpler societies. 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. Political development in contemporary societies will also be considered.

Prerequisite: ANT 150 or permission of instructor.

Mrs. P. Brown

*Fall, 3 credits*

### **ANT 255 Material Culture, Technology and Primitive Art**

This course will explore various approaches to the study of material culture in its technological and artistic aspects. Special consideration will be given to the relation between the material and non-material cultural forms and the value of such study to anthropological problems. Use will be made of the museum facilities in planning and designing exhibits which would express the anthropological approach and provide certain practical experience in the study of material culture.

Prerequisite: ANT 150 or permission of instructor.

Miss D. Newton

*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 150 or permission of instructor.

Mrs. M. Wheeler

*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



(1) the general theory of cultural evolution and (2) the post-Columbian history of the Americas.

Prerequisite: ANT 150 or permission of instructor.

Mr. P. Armillas

*Fall, 3 credits*

#### **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 150 or permission of instructor.

Mr. P. Armillas

*Spring, 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 civilizations 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 150 or permission of instructor.

Mr. P. Armillas

*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 150 or permission of instructor.

Mr. P. Armillas

*Spring, 3 credits*

#### **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 pre-industrial, 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 150 or permission of instructor.

Mr. L. Faron

*Spring, 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. Special attention is paid Southeast Asia.

Prerequisite: ANT 150 or permission of instructor.

Mr. D. Hicks

*Spring, 3 credits*

#### **ANT 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.

Prerequisite: ANT 150 or permission of instructor.

Mr. S. Regelson

*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 150 or permission of instructor.

Mrs. P. Brown

*Fall, 3 credits. Not offered 1969-70*

#### **ANT 301 Development of Anthropological Theory and Method**

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

Prerequisites: ANT 150 and advanced standing or permission of instructor.

Mr. L. Faron

*Fall and Spring, 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 and advanced standing or permission of instructor.

Mr. R. Stevenson

*Fall, 3 credits*

#### **ANT 304 Problems in Political and Economic Development**

A survey of the political and economic problems faced by undeveloped peoples as they become modern nations, and a discussion of some of their successes and failures in 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 and advanced standing or permission of instructor.

Mrs. P. Brown

*Fall, 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 and advanced standing or permission of instructor.

Mr. P. Carrasco

*Spring, 3 credits*

#### **ANT 310 Readings in Social Anthropology**

A colloquium in social anthropology emphasizing the impact of French sociology on British anthropology and the translation of these ideas into the post World War II anthropological world. Students will engage in independent library research on themes of their major interests.

Prerequisites: ANT 150 and advanced standing or permission of instructor.

Mr. L. Faron

*Spring, 3 credits*



## DEPARTMENT OF ART

*Professors:* LAWRENCE ALLOWAY, LEOPOLDO CASTEDO (*Chairman*), ILONA ELLINGER (*Visiting*)

*Associate Professors:* \*EDWARD COUNTEY, \*\*JACQUES GUILMAIN, JAMES H. KLEEGER

*Assistant Professors:* ALBERT BOIME, GEORGE KORAS, NINA A. MALLORY, ROBERT WHITE

*Instructor:* RONALD LUSKER

*Lecturer:* JACQUELINE BARNITZ (*Visiting*)

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.

Students who are interested in commercial art, or who wish to undertake a fine arts program in graduate school, are urged to concentrate their art electives in the studio area.

Those intending to do graduate work in art history, in preparation for museum work or college level teaching, are advised to concentrate on art history and theory. The department also strongly recommends that these students acquire a reading knowledge of German and/or French as part of their undergraduate program.

The student planning to teach on the elementary or secondary school level is advised to take a minimum of 12 credits in education, including ED/ART 240 (*Methods of Teaching Child Art*).

### Requirements for the Major in Art

In addition to the general university requirements for the bachelor of arts degree, the following courses are required for the major in art:

Completion of ART 101, 102, and 36 additional credits to be distributed in the following manner:

Art theory, criticism and history	12 credits
Studio courses (ART 121, 122, 123, 124)	12 credits
Electives in art (may be history, studio or both)	6 credits
Electives in related areas (courses outside the Department of Art, related to the student's particular interest, and meeting the approval of his departmental advisor)	6 credits

\*On leave Spring semester 1970.

\*\*On leave Fall semester 1969.

### 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

#### ART 101 History of Art and Architecture from Earliest Times to ca. 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.  
Mrs. N. Mallory

*Fall and Spring, 3 credits*

#### ART 102 History of Art and Architecture from ca. 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.  
Mr. A. Boime

*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.  
Staff

*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.

Prerequisite: Permission of instructor.

Staff

*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.

Prerequisite: ART 121 or permission of instructor.

Staff

*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.

Prerequisite: ART 121 or permission of instructor.

Staff

*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.

Prerequisite: ART 121 or permission of instructor.

Mr. J. Kleege

*Fall and Spring, 3 credits*

**ART 221 Studio V (Advanced Painting I)**

A course designed to develop the student's skills in composition and the applications of color theory. Watercolor and tempera will be used primarily as media in this course. Six hours studio work.

Prerequisite: ART 123 or permission of instructor.

Staff

*Fall, 3 credits*

**ART 222 Studio VI (Modeling, Casting, Direct Plaster Techniques)**

A studio course designed to develop the student's technical and compositional skills in the making of sculpture created out of malleable materials through additive techniques. Portrait and figure modeling in clay, plastilene and direct plaster. The study and practice of plaster casting techniques, and the study of metal casting techniques. Six hours studio work.

Prerequisite: ART 122 or permission of instructor.

Mr. G. Koras

*Fall, 3 credits*

**ART 223 Studio VII (Graphics I)**

A graphics course devoted to the techniques of engraving, etching, aquatint, mezzotint, and dry point, supplemented by lectures and recitations on the history of these techniques. Six hours studio work.

Prerequisite: ART 121 or permission of instructor.

Mr. E. Countey

*Fall, 3 credits*

**ART 231 Ancient Art**

The history of art in the ancient world from earliest times through the Roman period.

Prerequisite: ART 101 or permission of instructor.

Mrs. I. Ellinger

*Fall, 3 credits*

**ART 233 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 or permission of instructor.

Mr. J. Guilmain

*Spring, 3 credits*

**ART 234 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 ca. 1100 to the crystallization of the "International Style," ca. 1400.

Prerequisite: ART 101 or permission of instructor.

Mr. J. Guilmain

*Spring, 3 credits*

**ART 236 Major Artists**

A single major artist or architect will be selected (Giotto, Michelangelo, Rembrandt, Rubens, Bernini, Picasso, Brunelleschi or Wright). His development, his works and his influence on others will be carefully analyzed through lectures and class discussions.

Prerequisite: ART 102 or permission of instructor.

Mr. L. Alloway

*Fall, 3 credits*

### **ART 237 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 or permission of instructor.

Miss J. Barnitz

*Fall, 3 credits*

### **ART 240 Methods of Teaching Child Art**

A studio course designed to present techniques of teaching art to children through an understanding of the creative process. Emphasis will be on the process one goes through in making a work of art and on the feeling of growth one experiences. Discussions of students' art experience and relevance of this experience as it concerns the child's creative process. Stress also on understanding the meaning of children's art, how to teach art to children and the importance of an art program in the schools. Current readings in art and education will be studied and discussed. Lectures given on child art. This course is identical with Education 240.

Prerequisite: EDU 239.

Miss J. Snyder

*Spring, 3 credits*

### **ART 321 Studio VIII (Advanced Painting II)**

A course designed to develop the student's skill in oil painting and introduce him to the wide variety of modern painting media such as plastics and enamels; painting in mixed media. Six hours studio work.

Prerequisite: ART 221 or permission of instructor.

Staff

*Spring, 3 credits*

### **ART 322 Studio IX (Stone and Wood Carving Techniques)**

A studio course designed to develop the student's technical and compositional skill in



the making of sculpture created in hard materials through subtractive techniques. The study and practice of stone and wood carving. Six hours studio work.

Prerequisite: ART 122 or permission of instructor.

Mr. G. Koras

*Spring, 3 credits*

**ART 323 Studio X (Assemblage)**

Composing with more than one medium. The special, formal and aesthetic problems. Six hours studio work.

Prerequisites: ART 221, 222 or 223 or permission of instructor.

Staff

*Spring, 3 credits*

**ART 324 Studio XI (Graphics II)**

A graphics course devoted to the study of the techniques of woodcutting, wood engraving, intaglio color printing and serigraphy, supplemented by lectures and recitations on Oriental color prints and twentieth century print making. Six hours studio work.

Prerequisite: ART 123 or permission of instructor.

Staff

*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.

Prerequisite: Sponsorship of a faculty member.

Staff

*Fall and Spring, 3 or 6 credits. May be repeated with permission of department*

**ART 332 Italian Renaissance Art**

Renaissance painting, sculpture and architecture in Italy.

Prerequisite: ART 101 or 102 or permission of instructor.

Mrs. N. Mallory

*Fall, 3 credits*

**ART 333 Northern Renaissance Art**

Renaissance painting, sculpture and architecture in Northern Europe.

Prerequisite: ART 101 or 102 or permission of instructor.

Mrs. N. Mallory

*Fall, 3 credits*

**ART 335 Nineteenth Century Art**

European art of the nineteenth century.

Prerequisite: ART 102 or permission of instructor.

Mr. A. Boime

*Fall, 3 credits*

**ART 336 Twentieth Century Art**

European and American art of the twentieth century.

Prerequisite: ART 102 or permission of instructor.

Mr. A. Boime

*Spring, 3 credits*

**ART 337 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 or permission of instructor.

Staff

*Spring, 3 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.

Prerequisite: Art major with senior standing.

Staff

*Spring, 3 credits*

**ART 339 Pre-Columbian Art**

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

Prerequisite: ART 237 or permission of instructor.

Mr. L. Castedo

*Spring, 3 credits*

**ART 342 Northern Baroque Art**

Painting, sculpture and architecture in Holland, Belgium, Germany and France in the seventeenth and eighteenth centuries.

Prerequisite: ART 102 or permission of instructor.

Staff

*Spring, 3 credits*

#### **ART 344 Baroque Art and Architecture in Spain and Italy**

The study of the art and architecture of Italy and Spain from c. 1600 to c. 1750, including the investigation of the antecedents of the Baroque style in the art of the sixteenth century, and tracing its development in the seventeenth and eighteenth centuries. Special emphasis will be placed on the contributions of such major figures as Caravaggio, Bernini, Borromini and Velasquez.

Prerequisite: ART 102 or permission of instructor.

Mrs. N. Mallory

*Spring, 3 credits*

#### **ART 346 Ibero-American Plateresque and Baroque Art and Architecture**

A study of the painting, sculpture and architecture of Ibero-America from the sixteenth to the eighteenth centuries.

Prerequisite: ART 101 or 102 or permission of instructor.

Mr. L. Castedo

*Spring, 3 credits*

#### **ART 349 Art and Communication**

A spectrum of human communication of every kind will be proposed within which the position of art will be discussed. Both the unique properties of visual art and those shared with other media will be examined. Prerequisite: ART 101 or 102 or permission of instructor.

Mr. L. Alloway

*Fall, 3 credits*

#### **ART 350 Art as Environment**

A panorama of the interaction of the arts, including city-planning, popular culture and happenings. Critical discussion and individual research projects, analytical or original, will be required.

Prerequisite: ART 102 or permission of instructor.

Mr. L. Alloway

*Spring, 3 credits*





## DEPARTMENT OF BIOLOGICAL SCIENCES

*Professors:* \*\*EDWARD R. BAYLOR, JOHN CAIRNS, ELOF A. CARLSON, VINCENT P. CIRILLO, FRANK C. ERK, BENTLEY GLASS, \*\*THOMAS F. GOREAU, RAYMOND F. JONES (*Chairman*), HOWARD L. SANDERS (*Adjunct*), MELVIN V. SIMPSON, LAWRENCE B. SLOBODKIN, ROBERT R. SOKAL, \*DONALD F. SQUIRES, \*\*GEORGE C. WILLIAMS

*Associate Professors:* EDWIN H. BATTLE, MARTIN FREUNDLICH, HARVARD LYMAN, ROBERT W. MERRIAM, CARL MOOS, MONICA RILEY, F. JAMES ROHLF, ROBERT E. SMOLKER, BERNARD D. TUNIK, CHARLES WALCOTT

*Assistant Professors:* NORMAN ARNHEIM, JR., ALBERT D. CARLSON, BERNARD S. DUDOCK, LELAND N. EDMUNDS, JR., JOHN M. EMLER, JAMES S. FARRIS, GEORGE G. FOGG, JAMES A. FOWLER, JOHN J. GAUDET, RAYMOND F. GESTELAND, GEORGE J. HECHTEL, R. PETER KERNAGHAN, ABRAHAM D. KRIKORIAN, BENJAMIN H. LEICHTLING, ROLF STERNGLANZ, JOHN H. VANDERMEER, CHARLES F. WURSTER

*Instructor:* JONATHAN T. HARRIS

*Lecturer:* VERA K. FARRIS

The undergraduate program in biology is designed to provide an introduction to the principles and methodology of the biological sciences. The student can prepare for graduate study in the biological sciences, 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 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. Note: With the consent of his advisor, a student may petition the undergraduate studies committee of the department for permission to alter his departmental requirements.

- A. Study within the area of the major
  - BIO 150 (*Organisms, Ecology and Evolution*)
  - BIO 151, 152 (*Molecules, Genes and Cells*)

Note: Students are strongly advised to complete BIO 150, 151, 152 as soon as possible, preferably before their junior year.

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\*Director, Marine Sciences Research Center.

\*\*Member, Marine Sciences Research Center.

At least 16 additional credits in biology or related areas, chosen by the student in consultation with his advisor, of which at least 12 must be taken within the department. The total must include credits from at least two different biology courses with laboratory or laboratory courses.

Note: BIO 101, 102, 111, 113 (designed for non-majors) and BIO 159 (*History of Biology*) cannot be used to satisfy departmental graduation requirements.

B. Courses required in related fields

CHE 101, 102 (*Introductory Chemistry*) or CHE 103, 104

CHE 106 (*Quantitative Chemistry Laboratory B*) or CHE 108

CHE 201, 202 (*Organic Chemistry*) or CHE 211, 212

CHE 205 (*Organic Chemistry Laboratory B*) or CHE 203

MAT 102, 103 (*Calculus I, II*)

PHY 161, 162 (*Introductory Physics*) or PHY 101, 102

Note: Students planning to take chemistry courses such as CHE 153, 154 should note course requirements in program planning and should take PHY 101, 102.

C. Selection of electives

1. The curriculum for biology 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 post-college careers, students are *strongly urged* to consult their advisors, or other appropriate members of the department faculty, before making final course selections.

2. Students planning graduate or professional studies should obtain information on additional requirements of particular schools and programs.

3. 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.

4. Students preparing for secondary school teaching should note the new general requirements for provisional New York certification and for certification in science teaching.

5. For students with an interest in molecular or cellular biology, it is recommended that they include at least CHE 153 in their program.

D. Requirements for students enrolled before 1969-70

1. Students enrolled as *biological sciences majors* prior to academic year 1969-70 may choose to meet *either* the requirements specified

- in the *Bulletin* under which they entered the major, or the requirements specified in this *Bulletin*.
2. For students choosing the *Bulletin of entrance to the major*:
    - a. elective credits may be substituted for BIO 201, 202 and for labs in BIO 151, 152;
    - b. BIO 150 may be substituted for BIO 236 to meet the ecology core requirement;
    - c. for fulfillment of major requirements, the total credits within the area of the major must equal the total number of (required and elective) *biology* credits in the *Bulletin* of entrance (1966-67=36 credits; 1967-68=29 credits; 1968-69=29 credits).
  3. Students selecting the *present requirements* may make the following substitutions:
    - a. BIO 236 in place of BIO 150 plus one credit of laboratory elective;
    - b. BIO 151 (Fall 1968 or earlier) plus one credit of elective in place of BIO 151 plus BIO 162;
    - c. BIO 152 (Spring 1968 or earlier) plus one credit of elective in place of BIO 152 plus BIO 161.

### **Honors Program in Biological Sciences**

Departmental majors with a grade point average of 3.0 or better in courses in biology and related fields (see 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 sponsor. The student, with the approval of the sponsor, must submit a research proposal, in writing, to the department.

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

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 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 sponsor, another member of the department and an outside reader. In addition, the student must maintain a grade point average of not less than 3.4 in all biology and related courses taken in the senior year.

## 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. Biological principles and representative organisms are tied in to this conceptual approach. Laboratory experiments and demonstrations are alternated with small seminar groups, the latter exclusively dealing with biology and human values. Two hours of lecture each week and alternating periods of a four-hour laboratory and two hour discussion. Primarily intended for non-biology majors.

Mr. E. Carlson

*Fall and Spring, 4 credits each semester*

### BIO 111 Genetics and Man

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

Mr. F. Erk

*Fall, 3 credits*

### BIO 113 General Ecology

Designed to provide a sense of the problems of modern ecology; for non-biologists. 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.

Mr. L. Slobodkin

*Fall, 3 credits*

### BIO 150 Organisms, Ecology and Evolution

An introduction to the diversity, behavior, ecology and evolution of organisms, combined

with a consideration of evolutionary mechanisms and the principles of ecology. Three hours of lectures or discussions per week.

Prerequisite or corequisite: MAT 102.

Staff

*Spring, 3 credits*

### BIO 151, 152 Molecules, Genes and Cells I, II

The cell is studied as the unit of structure, biochemical activity, physiological specialization and genetic control and continuity. The principles of cellular metabolism, bioenergetics and biosynthesis are applied to an understanding of the relationship between cell structure and function, the processes of cell growth and multiplication and the activities of the cells of selected specialized tissues of higher organisms (e.g., nerve and muscle). The gene is examined as a unit of mutation, recombination and function. The mechanisms of genetic expression and regulation and the processes of transmission of inherited characteristics will be studied at the molecular, viral and cellular levels. Three hours of lectures and discussions per week. Prerequisites: CHE 101, 102. BIO 151 is a prerequisite to BIO 152.

Corequisite: CHE 201.

Mr. V. Cirillo, Mrs. M. Riley

*Fall and Spring, 3 credits each semester*

### 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. Reading of some original sources will be included. Three hours of lectures or discussions. This course is identical with HIS 159.

Prerequisite: Six credits of biology or permission of instructor.

Miss R. Cowan

*Fall, 3 credits*

### 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 or corequisite: BIO 151.

Mr. F. Erk

*Fall, 2 credits*

### **BIO 162 Cell Biology and Biochemistry Laboratory**

A series of laboratory experiments and discussion designed to complement BIO 151, 152. 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 152.

Staff

*Spring, 2 credits*

### **BIO 201 General 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 functions in higher organisms. Three hours of lecture or discussion and one laboratory per week.

Prerequisites: BIO 151, 152.

Prerequisite or corequisite: PHY 161 or PHY 101.

Mr. B. Tunik, Mr. C. Moos

*Fall, 4 credits*

### **BIO 231 Statistics for Biologists**

Introductory statistics for biologists. 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. A general course for students in all areas of biology. Students desiring to take an intensive course in statistics for ecologists and evolutionists should consult the *Graduate Bulletin*. Three hours of lectures or discussions per week.



Prerequisite: MAT 103 or permission of instructor.

Mr. J. Farris

*Fall, 3 credits*

### **BIO 236 Field and Theoretical Ecology**

An examination of the interactions of living organisms with their physical and biological environments. The subject matters of modern population biology, including population ecology and dynamics, ecological genetics and biogeography will be discussed, with emphasis on their relevance to the study of evolving biotic communities. Two hours lecture, one four-hour laboratory period per week.

Prerequisite: BIO 150 or permission of instructor.

Mr. J. Emlen, Mr. G. Fogg

*Spring, 4 credits*

**BIO 237 Invertebrate Zoology**

An introduction to the diversity, comparative and functional morphology, natural history and evolution of invertebrates, with interest centered on the modern fauna. Emphasis is placed on feeding and locomotory mechanisms, the adaptive radiation of major phyla and the evolution of the metazoan, metameric and coelomate conditions. Protozoans and insects receive brief introduction. The laboratory includes comparative studies of representatives of major groups and makes extensive use of living material. Three hours of lectures or discussions and one three-hour laboratory per week.

Prerequisite: BIO 150 or permission of instructor.

Mr. G. Hechtel

*Fall, 4 credits*

**BIO 238 Chordate Zoology**

An introduction to the diversity, comparative and functional morphology, natural history and evolution of chordates, with interest centered on the modern fauna. Topics include the origin of the vertebrate body plan, the transition from water to land and the adaptive radiation of fishes and tetrapods. The laboratory includes a comparative study of organ systems in representative protochordates and vertebrates. Three hours of lectures or discussions and one three and one-half hour laboratory per week.

Prerequisite: BIO 150 or permission of instructor.

Mr. G. Hechtel

*Spring, 4 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. Six weeks of lectures and laboratory. Prerequisites: BIO 101, 102 or BIO 150, 151, 152 or equivalent.

Mrs. V. Farris

*Summer, 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 permission of instructor.

Mr. J. Fowler

*Spring, 3 credits*

**BIO 261 Morphology of Vascular Plants**

This course emphasizes the developmental morphology of vascular plants. Examination will be made of both normal forms of plant cells, tissues and organs as well as those forms that result from natural or artificial manipulation of the environment. Two hours of lectures or discussion and one three-hour laboratory per week.

Prerequisite: BIO 150 or permission of instructor.

Mr. J. Gaudet

*Fall, 3 credits*

**BIO 293, 294 Special Topics from the Biological Literature**

Tutorial reading in the biological sciences. Periodic conferences, final report and examinations arranged with instructor on an individual basis.

Prerequisite: Acceptance by a faculty sponsor. Staff

*Fall and Spring, 1 credit each semester*

**BIO 298, 299 Research Project**

In this course the more capable biology major may work under the supervision of a member of the staff in developing an individual project making use of the knowledge and techniques acquired in previous courses. He is expected to prepare an appropriate report on his project and to present a student seminar. Grade is determined on the basis of the adequacy of the project presented. The course may be taken more than two semesters, but no more than eight credits may be



utilized for departmental graduation requirements.

Prerequisite: Open to biology majors with the consent of the chairman and the staff member who will supervise the work.

Staff

*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.

Prerequisite: Attainment of junior status as biology major or permission of instructor.

Mr. R. Smolker

*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.

Mr. P. Lefevre

*Spring, 3 credits*

### **BIO 310 Developmental Genetics**

The genetic analysis of developmental events in higher organisms. Topics considered include structural and chemical differentiation, chromosomal differentiation, pleiotropism, sex differentiation and determination, and environmental effects on phenotypic expression. Three hours of lectures and one hour of discussion per week.

Prerequisites: BIO 151, 152 and permission of instructor.

Mr. F. Erk

*Spring, 4 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: MAT 103, BIO 150, 151, 152 and permission of instructor.

Mr. F. Rohlf

*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 one hour of discussion per week.

Prerequisites: BIO 151, 152 and permission of instructor.

Mrs. M. Riley

*Fall, 4 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.

Mr. V. Cirillo, Mr. R. Jones

*Spring, 3 credits*

### **BIO 321 Microbiology**

An introduction to the study of microorganisms through a series of problems which include considerations of taxonomy, development, structure, physiology, reproduction and ecology. Two hours of lectures or discussion and two three-hour laboratories per week.

Prerequisites: CHE 201, 202 and 205 or permission of instructor.

Mr. E. Battley

*Fall, 4 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 238.

Mr. R. Smolker

*Spring, 2 credits, alternate years, beginning 1970*

### **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. Prerequisites: BIO 151, 152 and junior standing.

Mr. C. Wurster

*Fall, 1 credit*

### **BIO 334 Marine Vertebrate Zoology**

Ecology, systematics and evolution of marine fishes, and brief treatment of marine representatives of other vertebrate classes. Two hours of lectures or discussions per week. Prerequisite: BIO 238.

Mr. G. Williams

*Spring, 2 credits, alternate years, beginning 1970*

### **BIO 338 Marine Planktonology**

Ecology of coastal and estuarine plankton; trophic relations, seasonal and geographic succession, zooplankton behavior, evolutionary significance of meroplankton. Two hours of lectures or discussions per week. Prerequisite: BIO 237.

Mr. G. Williams

*Spring, 2 credits, alternate years, beginning 1971*

### **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.

Prerequisite or corequisite: BIO 334 or BIO 338.

Mr. G. Williams

*Spring, 2 credits*

### **BIO 345 Plant Systematics**

This course examines the basic concepts of plant taxonomy and includes such topics as

the development of classification, effect of evolutionary theory on systematics, principles used in determining relationships, delimitation of taxa and the concept and analysis of characters. The laboratory will include detailed study of selected plant families and application of taxonomic techniques. Two hours of lectures or discussions and two laboratories per week.

Prerequisite: Junior status as a biology major or permission of the instructor.

Mr. G. Fogg

*Fall, 4 credits*

### **BIO 346 Aquatic Botany**

A consideration of the systematics, distribution and evolution of aquatic plants, as exemplified by the aquatic flora of Long Island. The physical, chemical and biological aspects of the aquatic environment will be investigated by means of field and laboratory experiments.

Prerequisites: CHE 102 or 104 and one year of general biology or equivalent.

Mr. J. Gaudet

*Summer, 4 credits*

### **BIO 351 General Plant Physiology**

This course will emphasize the physiological patterns and integration of cellular processes that culminate in plant growth. Special attention will be given to water and salt uptake, translocation, mineral nutrition, transpiration, respiration, photosynthesis, nitrogen metabolism and reproduction as a function of age and the ecological environment. Three hours of lectures or discussions per week.

Prerequisites: BIO 151, 152 and CHE 201.

Mr. A. Krikorian

*Fall, 3 credits*

### **BIO 352 Experimental Plant Physiology and Development**

Projects emphasizing the correlation of growth and development with morphology and physiological functions. Two hours of discussion and two three-hour laboratories per week.

Prerequisite: BIO 261 or BIO 351.

Mr. A. Krikorian

*Spring, 4 credits*

**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 and permission of instructor.

Mr. M. Simpson

*Fall, 4 credits*

**BIO 381 Introduction to the Nervous System**

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.

Mr. A. Carlson

*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. Topics considered will vary from year to year, but will include orientation, ethology and social behavior. Three hours of lectures or discussions per week. Prerequisite: BIO 201 or permission of instructor.

Mr. C. Walcott

*Spring, 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; the role of nucleus and cytoplasm; influence of light, temperature and chemicals; use of the clock for adjustment to diurnal, tidal and lunar cycles, for direction finding (homing and orientation) and for day-length measurement (photoperiodism);

breakdown of circadian organization; possible mechanisms of the clock. Three hours per week of lecture, discussion and reports.

Prerequisites: BIO 151, 152; CHE 201, 202; a basic knowledge of plant and animal physiology is highly recommended; or with permission of instructor.

Mr. L. Edmunds

*Spring, 3 credits*

**BIO 391 Seminar in Organismic and Environmental 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.

Staff

*Fall, 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.

Staff

*Spring, 2 credits*

**BIO 393 Seminar in Developmental 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.

Staff

*Fall, 2 credits*

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**Graduate Courses**


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

## INTERDISCIPLINARY PROGRAM IN BLACK STUDIES

The undergraduate program in black studies aims at combining training in a discipline or closely related disciplines with a proper appreciation of the contributions of black people to the history and cultures of the world, as well as a full understanding of the problems which black people have faced. The program includes a study of sociocultural institutions, traditions and contemporary conditions of black people. It is intended to provide the black studies major with an academic background sufficient for specialization in the field in a graduate program.

In addition to the general university requirements for the bachelor of arts degree, majors in the black studies program must complete 18 semester courses arranged in two groups:

- A. Core Curriculum: Eight formal courses and two independent study projects listed specifically as black studies courses.\* (Core courses will be cross-listed from departmental offerings when appropriate.) The core courses as of fall 1969 are:
1. BLS 110 (*Literature of Modern Africa*) This course is identical with EGL 110.
  2. BLS 251 (*Education of the Afro-American in America*) This course is identical with EDU 251.
- B. Related Studies: Eight semester courses selected from among other departmental offerings which have been designated by the student and his advisor as appropriate related courses.
- Note: Approval for additional specific courses under A and B will be sought in the near future. The added courses will be announced so that interested students can plan to take them in subsequent semesters.

For further information about the black studies program, consult Professor Annie Mae Walker, program chairman, whose office is in the Education Department.

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\*The two independent study projects listed specifically as black studies courses may be taken by majors only upon completion of five of the eight core curriculum courses.

## DEPARTMENT OF CHEMISTRY

*Professors:* JOHN M. ALEXANDER, FRANCIS T. BONNER (*Chairman*), BENJAMIN CHU, HAROLD L. FRIEDMAN, ALBERT HAIM, EDWARD M. KOSOWER, PAUL C. LAUTERBUR, WILLIAM J. LENOBLE, YOSHI OKAYA, FAUSTO RAMIREZ, SEI SUJISHI

*Associate Professors:* THEODORE D. GOLDFARB, NOBORU HIROTA, RICHARD N. PORTER, ROBERT F. SCHNEIDER, DAVID W. WEISER, J. L. WHITTEN, ARNOLD WISHNIA

*Assistant Professors:* F. W. FOWLER, DAVID M. HANSON, RAYMOND G. JESAITIS, PHILIP M. JOHNSON, ROBERT C. KERBER, ALLEN KRANTZ, GEORGE H. KWEI, DAVID A. LLOYD, STEVEN L. MUROV, STEPHEN E. SCHWARTZ, CHARLES S. SPRINGER, EDWARD I. STIEFEL

*Director of Chemical Laboratories and Lecturer:* PAUL D. CROFT

*Coordinator of General Chemistry Laboratories and Lecturer:* JAMES W. 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 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.

### 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 or Intensive Introductory Chemistry*)
  - CHE 105 or 107 (*Introductory Chemistry Laboratory*)
  - CHE 108 (*Quantitative Chemistry Laboratory*)
  - CHE 153 (*Physical Chemistry I*)
  - CHE 154 (*Physical Chemistry 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

MAT 102, 103 (*Calculus I, II*) and 155, 156 \* (*Calculus III, IV*)

Three semesters of physics (commonly PHY 101, 102, 151)

For those students who plan to pursue post graduate studies in chemistry, it is recommended that a reading knowledge be attained in German and 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 ACS certification requirements must take, in addition to the above requirements, CHE 257 and one additional advanced chemistry course; and they must demonstrate a reading knowledge of German or Russian.

#### 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 or Intensive Introductory Chemistry*)

CHE 105 or 107 (*Introductory Chemistry Laboratory*)

CHE 108 (*Quantitative 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 or 257 or 258 (*Organic Chemistry Laboratory or Instrumental Methods of Physical Chemistry or Molecular Structure and Spectroscopy Laboratory*)

CHE 305 (*Inorganic Chemistry I*)

B. Courses in related fields

MAT 102, 103, 155 (*Calculus I, II, III*)

Three semesters of physics (Commonly PHY 101, 102, 151)

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\*The mathematics sequence 193-6 may be substituted for MAT 102, 103, 155, 156.

### Honors Program in Chemistry

Students who have maintained a cumulative grade point average of 3.0 in chemistry, physics and mathematics through the junior year are eligible for departmental honors in chemistry. The basic requirement for honors is completion of a senior thesis based upon research performed during the senior year. The thesis will be read by a committee consisting of the student's senior research advisor, one other faculty member from the Department of Chemistry and a faculty member from another department in a related field. The awarding of honors requires the recommendation of this committee and is also contingent upon the maintenance of a 3.0 cumulative grade point average in all required course work in chemistry, physics 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 101, 102 Introductory Chemistry

Emphasis is placed on chemical principles, presented in terms of modern theory and in a context of sufficient descriptive subject matter to lend them interpretive value. Principal topics covered are the states of matter, gas laws, atomic theory, chemical equations and stoichiometry, thermodynamics, chemical equilibrium, the EMF series, kinetic theory, reaction kinetics, properties of the elements and the periodic table, atomic structure, chemical bonding and selected topics in descriptive chemistry. Three lecture hours and one hour of discussion per week for 101; two lecture hours and one recitation hour per week for 102.

Corequisite to 101: CHE 105.

Corequisite to 102: CHE 106 or 108, MAT 102.

Mr. W. le Noble, Mr. A. Haim and staff  
*101, 4 credits; 102, 3 credits*

#### CHE 103, 104 Intensive Introductory Chemistry

An intensive introductory chemistry course similar to CHE 101, 102 for students meeting the corequisite requirements listed below. Open to those freshman students who have offered for admission a record indicating ex-

ceptional ability and interest in mathematics and the physical sciences. Three lecture hours and one recitation hour per week for 103; two lecture hours and one recitation hour per week for 104.

Corequisites: CHE 107, PHY 101 or 161, 102 or 162 and MAT 102, 103.

Corequisite to 104: CHE 106 or 108.

Mr. E. Stiefel and staff

*103, 4 credits; 104, 3 credits*

#### CHE 105 Introductory Chemistry Laboratory B

Laboratory experiments illustrate the principles presented in CHE 101 and provide an introduction to quantitative analysis. Four hours of laboratory and discussion per week. Corequisite: CHE 101.

Mr. J. Hagen and staff

*Fall, 1 credit*

#### CHE 106 Quantitative Chemistry Laboratory B

A continuation of the laboratory work in CHE 105, for those students who do not plan to major in chemistry. Four hours of laboratory and discussion per week.

Corequisite: CHE 102 or CHE 104.

Mr. J. Hagen

*Spring, 1 credit*



### **CHE 107 Introductory Chemistry Laboratory A**

Laboratory experiments illustrate the principles presented in CHE 103 and provide an introduction to quantitative analysis. Four hours of laboratory and discussion per week. Corequisite: CHE 103.

Mr. J. Hagen and staff

*Fall, 1 credit*

### **CHE 108 Quantitative Chemistry Laboratory A**

For students who plan to major in chemistry. Designed to develop techniques which are essential for precise and accurate chemical analysis. Gravimetric and volumetric analysis and synthesis and purification of inorganic compounds. Six hours of laboratory and discussion per week.

Corequisite: CHE 102 or CHE 104.

Mr. T. Goldfarb

*Spring, 2 credits*

### **CHE 153 Physical Chemistry I**

Chemical equilibria in ideal systems, solubility products, acid-base ionization constants; reaction kinetics and mechanisms; chemical thermodynamics through the second law; energy; enthalpy; entropy; and free energy. Three lecture hours per week.

Prerequisite: CHE 102 or 104.

Corequisites: MAT 103 and PHY 101 or 161.

Mr. H. Friedman

*Fall, 3 credits*

### **CHE 154 Physical Chemistry II**

The laws of thermodynamics, chemical potential and chemical equilibria for non-ideal systems, transport phenomena. Three lecture hours per week.

Prerequisite: CHE 153.

Corequisites: MAT 155 and PHY 102 or 162.

Mr. R. Porter

*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 108.

Corequisite: CHE 153.

Mr. N. Hirota

*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.

Mr. A. Wishnia

*Spring, 2 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. Three lecture hours per week.

Prerequisites: CHE 102 or 104; 106 or 108.

Corequisite to CHE 201: CHE 203 or 205.

Mr. F. Ramirez

*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.

Mr. S. Murov (203), Mr. F. W. Fowler (204)

*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.

Mr. R. Jesaitis (205), Mr. A. Krantz (206)

*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. Three lecture hours per week.

Prerequisite: CHE 153 or permission of instructor.

Corequisite to CHE 211: CHE 203 or 205.

Mr. R. Kerber

*Fall and Spring, 3 credits each semester*

**CHE 239 Materials and Methods in Teaching Physical Science**

Designed for prospective secondary school teachers of physics and chemistry, the course emphasizes methods and materials appropriate to the teaching of a physical science at the high school level and stresses recent curricular developments. Three class hours per week. This course is identical with PHY 239 and ESS 239.

Prerequisites: PHY 161, 162 or equivalent, CHE 101, 102, MAT 155, 156 or equivalent and concurrent study of an intermediate course in either chemistry or physics.

*Spring, 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, MAT 155.

Corequisite: PHY 151 or 261.

Mr. J. Whitten

*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, MAT 156.

Mr. R. Schneider

*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.

Mr. P. Johnson, Mr. S. Schwartz

*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.

Mr. P. Johnson, Mr. S. Schwartz

*Spring, 2 credits*

**CHE 302 Experimental Methods of Organic Chemistry**

Introduction to methods of research in organic chemistry with emphasis on use and evaluation of instrumental techniques in qualitative and quantitative organic analysis. The latter half of the course will feature planning and performance of an individual project of an exploratory nature. Two lecture hours and six laboratory hours per week.

Prerequisite: CHE 204.

*Spring, 4 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.

Prerequisite: CHE 255.  
 Corequisite: CHE 202 or 212.  
 Mr. S. Sujishi  
*Fall, 3 credits*

### **CHE 306 Inorganic Chemistry II**

A continuation of CHE 305. Three lecture hours per week.  
 Prerequisite: CHE 305.  
 Mr. S. Sujishi  
*Fall or Spring, 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.  
 Mr. A. Krantz  
*Fall, 3 credits*

### **CHE 325 Intermediate Physical Chemistry**

An introduction to the methods and theory currently used to investigate and describe atomic and molecular structure. Topics to be covered include introductory wave mechanics, exact and approximate solutions to the Schrödinger equation, applications to the problem of chemical bonding and atomic and molecular spectroscopy. Three lecture hours per week.  
 Prerequisites: CHE 256 and 258.  
 Mr. D. Lloyd  
*Spring, 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 and acceptance as a research student by a member of the departmental staff.  
 Corequisite: CHE 305.  
 Staff  
*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.  
 Prerequisite: Consent of an instructor and permission of the chairman.  
 Staff  
*Fall and Spring, 1-3 credits each semester*

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## **GRADUATE COURSES**

Senior chemistry students who have high academic standing may request permission to register in the following graduate courses. They are urged to consult the appropriate instructor to ascertain the background assumed in courses which interest them. See *Graduate Bulletin* for details.

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

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## COURSES IN CLASSICAL LANGUAGES AND CHINESE

The following courses are offered pending the development of full programs.

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### Greek

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#### GRK 111, 112 Elementary Greek

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

Mrs. A. Wilson

*Fall and Spring, 3 credits each semester*

#### GRK 151, 152 Intermediate Greek

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

Prerequisite: GRK 112 or permission of instructor.

Mrs. A. Wilson

*Fall and Spring, 3 credits each semester*

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### Latin

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#### 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, Vergil and Livy.

Prerequisite: Three years of high school Latin.

Mr. A. Godfrey

*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.

Mr. A. Godfrey

*Fall, 3 credits*

#### LAT 154 Literature of the Roman Empire

Selected works of Vergil, 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.

Mr. A. Godfrey

*Spring, 3 credits*

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### Chinese

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#### 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.

Mrs. S. Hu

*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.

Mrs. S. Hu

*Fall and Spring, 3 credits each semester*

## DEPARTMENT OF EARTH AND SPACE SCIENCES

*Professors:* <sup>a</sup>DONALD H. LINDSLEY, ALLISON R. PALMER, OLIVER A. SCHAEFFER  
(*Chairman*), <sup>b</sup>DONALD F. SQUIRES, <sup>c</sup>BENGT STROMGREN, <sup>d</sup>PETER K.  
WEYL

*Associate Professors:* <sup>e</sup>HONG-YEE CHIU, ROBERT T. DODD, <sup>d</sup>M. GRANT GROSS,  
JOHANNES HARDORP, JAMES J. PAPIKE, CHARLES T. PREWITT, STEPHEN  
E. STROM

*Assistant Professors:* A. EDWARD BENCE, WILLIAM GEBEL, GILBERT N. HANSON,  
FRANK SHU, MICHAL SIMON, RAYMOND N. SMITH

*Curator:* CHARLES F. BUDDENHAGEN

The earth and space science undergraduate program is designed primarily to prepare students for graduate work in one or more of the earth or space sciences. In addition to work in the basic physical sciences and mathematics, the students will be exposed to the problems of the complex physical world with its large time-space scale. At the present time, the department offers undergraduate sequences leading to specialization in geological and astronomical sciences. The scope of the department will be extended, hopefully in the near future, to include the areas of the present physical environment leading to graduate work in oceanography and atmospheric science. Students interested in marine biology should major in biological sciences.

The earth and space sciences undergraduate program requires no specific set of courses so that a student has a wide choice to take advantage of the interdisciplinary nature of the department. In this way, a curriculum of studies can be selected which is tailored to the special interest of the student. The student's program will be planned in consultation with an advisor assigned by the department.

### Requirements for the Major in Earth and Space Sciences

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  
27 credits of courses in the Department of Earth and Space Sciences, of

<sup>a</sup> Not in residence academic year 1969-70.

<sup>b</sup> Director of the Marine Science Research Center.

<sup>c</sup> Distinguished Professor of Astronomy, Royal Danish Observatory, Copenhagen, adjunct at Stony Brook.

<sup>d</sup> Member of the Marine Science Research Center.

<sup>e</sup> NASA/Goddard Space Studies Institute, part-time at Stony Brook.

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**

27 credits of courses in biology, chemistry, physics or mathematics, of which at least four courses of three or more credits are concentrated in either biology, chemistry or physics or in mathematics courses above MAT 150. At least one year of chemistry, physics and mathematics are a minimal requirement. (These credits are in addition to any credits substituted for earth and space science courses under requirement A.)

**Honors Program in Earth and Space Sciences**

Students who have maintained a cumulative grade point average of 3.0 in natural sciences and mathematics through the junior year may become candidates for departmental honors in earth and space sciences upon application to the department. The basic requirement for honors is completion of a senior thesis based upon research performed during the senior year. The thesis will be read by a committee consisting of the student's senior research advisor, one other faculty member from the Department of Earth and Space Sciences and a faculty member from another department in a related field. The awarding of honors requires the recommendation of this committee, and is also contingent upon the maintenance of a 3.0 GPA in all course work in natural sciences and mathematics.

A supplement to this *Bulletin*, including latest course offerings, may be obtained from the department office.

**COURSES IN EARTH AND SPACE SCIENCES**

**Introductory Courses**

The following courses while of interest and value to science students are primarily designed for the general university student who is not majoring in a physical science, but who elects the course either because of a personal interest or to fulfill the science requirement of the College of Arts and Sciences.

**ESS 101 Astronomy**

The development of astronomy is followed from the early Greeks through Kepler and Newton down to the present time. Topics covered are: the moon, the solar system, the determination of planetary and stellar distances, stellar spectra, masses of stars, structure and energy of the sun and stars, stellar

evolution, galaxies and cosmology. Three lecture hours and one three-hour laboratory per week.

*Fall, 4 credits*

**ESS 102 Physical Geology**

Earth processes, such as weathering, sedimentation, glaciation, vulcanism, metamor-

phism and mountain building are considered. Laboratory work includes the identification of minerals and rocks, introduction to maps and field trips in the vicinity. Three lecture hours and one three-hour laboratory per week.

*Fall, 4 credits*

### **ESS 103 The Atmosphere**

An introduction to the near-earth environment. The course will deal primarily with the physics and chemistry of the atmosphere; topics covered will include composition, structure, motions, weather, climate and instrumentation, observations, synoptic analysis and research projects. Three lecture hours and one three-hour laboratory per week.

*Spring, 4 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. The study cuts across the usual fields of specialization as the economy of nature involves, among others, 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 lectures and one three-hour laboratory per week.

*Spring, 4 credits*

### **ESS 106 Historical Geology**

Methods for dating the past; techniques for interpreting geologic history; evolution of

plants and animals; changes in global geography and geologic history of selected areas of North America are considered. Laboratory work includes examination of fossils, interpretation of geologic maps and cross-sections. Three lectures and one three-hour laboratory per week.

Prerequisite: ESS 102 or equivalent.

*Spring, 4 credits*

### **ESS 111 Astronomy**

This course is identical to ESS 101 except there is no laboratory.

*Fall, 3 credits*

### **ESS 112 Physical Geology**

This course is identical to ESS 102 except there is no laboratory

*Fall, 3 credits*

### **ESS 113 The Atmosphere**

This course is identical to ESS 103 except there is no laboratory.

*Spring, 3 credits*

### **ESS 114 Oceanography**

This course is identical to ESS 104 except there is no laboratory.

*Spring, 3 credits*

### **ESS 116 Historical Geology**

This course is identical to ESS 106 except there is no laboratory.

Prerequisite: ESS 102 or 112 or equivalent.

*Spring, 3 credits*

## **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 chemistry, physics and/or mathematics at the university level.

### **ESS 121, 122 Introductory Seminar in Astronomy I, II**

An introduction to the observational basis of astronomy and to the theory of stellar

astrophysics. Discussion of the equilibrium conditions prevailing in stellar interiors, the nature of stellar atmospheres, the mechanism of element synthesis and the process of stellar evolution. Term projects may include stu-



dent participation in carrying out a chemical abundance analysis of a star. All students will receive some instruction in the use of electronic computers. Three hours lecture or recitation.

Prerequisite: Permission of instructor.

*Fall and Spring, 3 credits each semester*

### **ESS 201 Introduction to Mineralogy and Petrology**

The properties of minerals are shown to arise from and reflect their atomic structures. Consideration of the influence of changing physical conditions provides the basis for a discussion of rocks and rock-forming processes, and the role of these processes in the evolution of the crust. Laboratories are devoted to mineral identification and rock classification. Two lectures and two three-hour laboratory sessions per week.

Prerequisite: ESS 102, CHE 102 or 104 or permission of instructor.

*Fall, 4 credits*

### **ESS 211 Introductory Paleontology**

An introduction to the principles and practices of the study of ancient life. The nature and variety of fossil organisms, interpretation of environments of the past, the use of fossils in problems of evolution, biogeography and geological dating are considered. Two lecture hours and one three-hour laboratory per week.

Prerequisite: ESS 106.

*Spring, 3 credits*

The following courses are designed primarily for majors in earth and space sciences in their senior year. The courses may be elected by seniors in other science areas. Qualified juniors will be admitted to the courses with permission of the instructor.

### **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.

*Fall, 4 credits*

### **ESS 239 Materials and Methods in the Teaching of Physical Science**

Designed for prospective secondary school teachers of earth and space sciences, chemistry and physics, the course emphasizes methods and materials appropriate to the teaching of a physical science at the high school level and stresses recent curriculum developments. Three class hours per week. This course is identical with CHE 239 and PHY 239.

Prerequisites: PHY 161, 162 or equivalent, CHE 101, 102, MAT 155, 156 or equivalent and concurrent study of an intermediate course in either chemistry or physics.

*Spring, 3 credits*

### **ESS 241 The Solar System**

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 lecture hours per week.

Prerequisites: MAT 156, PHY 152 or permission of instructor.

*Fall, 3 credits*

### **ESS 242 Introduction to Astrophysics**

This course is concerned with physical processes in stars and the interstellar medium. Three lecture hours per week.

Prerequisites: ESS 101, MAT 156, PHY 151 or permission of instructor.

*Spring, 3 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 Igneous and Metamorphic Petrology**

Principles of the description, classification and interpretation of igneous and metamorphic rocks. Lectures will introduce the students to the use of field and laboratory data for rock interpretation. Laboratories will stress the study of thin sections with the petrographic microscope. Includes field trips to nearby igneous and metamorphic areas. Two one-hour lectures and two two-hour laboratories per week.

Prerequisite: ESS 301.

Corequisite: CHE 154.

*Spring, 3 credits*

### **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 or permission of instructor.

*Fall, 4 credits*

### **ESS 312 Stratigraphy**

Origin and interrelationships of sedimentary rock bodies; interpretation of distribution of fossils, stratigraphic classifications; methods and criteria for correlation, techniques of stratigraphic analysis; common stratigraphic models. Two one-hour lectures and weekend field trips.

Prerequisite: ESS 201 or ESS 211 or permission of instructor.

*Fall, 3 credits*

### **ESS 322 Introductory Geochemistry**

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 154 or permission of instructor.

*Spring, 3 credits*

### **ESS 341 Astrophysical Processes**

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. Three one-hour lectures per week.

Prerequisites: PHY 202 and 212.

*Fall, 3 credits*

### **ESS 342 Interstellar and Galactic Astrophysics**

The general properties of the interstellar gas and dust; the emission and absorption of the 21 cm. hydrogen line; the reddening and polarization of starlight and radio waves. Discussion of the interstellar magnetic field, the origin of cosmic rays and the mechanism of synchrotron radiation. Introduction to the dynamics of star clusters and galaxies. Application to the study of the large-scale structure of galaxies. Three hours lecture per week.

Prerequisites: PHY 202 and 212, ESS 341 or permission of instructor.

*Spring, 3 credits*

### **ESS 343 Laboratory Course in Astronomical Techniques**

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 measurements and the reduction of data. Three one-hour lectures and two four-hour laboratories.

Prerequisite: ESS 242.

*Fall, 3 credits*

### **ESS 345 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 HII regions, planetary nebulae and globules will be discussed. Three one-hour lectures per week.

Prerequisite: ESS 341.

*Fall, 3 credits*

### **ESS 346 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.

Prerequisites: ESS 341, PHY 212.

*Spring, 3 credits*

### **ESS 363 Sediments and Sedimentary Processes**

A study of sedimentary processes as related to the ocean. Sediment environment as related to the coastal ocean, marginal ocean basins, the deep ocean bottom, lakes and fluvial environments are studied. The sediment minerals and the processes important in sediment formation are discussed. Two hours lecture and one three-hour laboratory per week.

## **Graduate Courses**

Qualified seniors may take 500 level courses with the permission of the department chairman. See *Graduate Bulletin*.

Prerequisite: ESS 201.

*Fall, 3 credits (alternate years)*

### **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 and senior standing or permission of instructor.

*Fall, 3 credits (alternate years)*

*Not given 1969-70 academic year*

### **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.

*Fall and Spring, 3 credits each semester, 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 each semester*

## DEPARTMENT OF ECONOMICS

*Professors:* EDWARD AMES (*Chairman*), \*CHARLES HOFFMANN, ROBERT LEKACHMAN, EGON NEUBERGER, HERMAN STEKLER

*Associate Professors:* ESTELLE JAMES, PETER KALMAN, ELIYAHU KANOVSKY, MARVIN KRISTEIN, CHARLES E. STALEY

*Assistant Professors:* JAMES CORNEHLS, WILLIAM DAWES, RICHARD DUSANSKY, \*HELEN KRAMER, LEONARD MILLER, LAWRENCE NORDELL, MAHMOUD SAKBANI, JAMES SALPIETRO, GREGORY SCHOEFFLE, EDWARD VAN ROY, DIETER ZSCHOCK, MICHAEL ZWEIG

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

After taking the introductory course ECO 100, which presents 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.

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\*On leave academic year 1969-70.

### 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:\*

ECO 100 (*Introductory Economics*) \*\*

ECO 211 or 215 (*Intermediate Microeconomic Theory*)

ECO 212 or 216 (*Intermediate Macroeconomic Theory*)

A total of 30 credit hours in courses in economics.

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

*Eligibility.* To enter the honors program, a student must have a grade point average of 3.0 or better in economics. To graduate with honors a student must have a

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\*These requirements apply to *all* economics majors, those already declared as well as those who enter the program after the academic year 1968-1969.

\*\*Students who have already taken the old ECO 101 or 102 may take ECO 100 for credit, but are *not required* to do so for the major. The department will accept a passing grade in either ECO 101 or 102 as equivalent to completion of ECO 100 for any course having ECO 100 as a prerequisite. Students who have passed both ECO 101 and 102 may not enroll in ECO 100 for credit.

grade point average of 3.4 or better in economics and must complete an acceptable honors thesis.

*The Program.* The honors program consists of a two-part sequence of work which will ordinarily commence after the student has completed ECO 211 or 215 and 212 or 216 and will culminate in an honors thesis.

In the first part the student will write a term paper, serving as a preliminary study of the work he intends to pursue more deeply during the second part of the program. Normally the term paper will be written in conjunction with a regular undergraduate course, although in special circumstances it may be handled as an independent study project and may carry from one to three units of credit.

In the second part (to be spread over two semesters or concentrated in one semester, at the student's option) the student will register for three to six units of ECO 393 and/or 394, which will consist of intensive work on his honors thesis under the supervision of a faculty member, chosen by mutual agreement. Students taking 393 or 394 for honors will also be expected to present their research methods, problems and results in a special honors seminar or tutorial, as part of their obligations for the course.

Upon completion, the honors thesis shall be submitted to an honors committee, consisting of the thesis supervisor, another member of the Economics Department and a member of another department (invited to serve by the provost at the suggestion of the chairman of the Economics Department). A majority of the committee must report that the thesis is of honors quality.

*Application.* The student should apply formally to the departmental honors advisor any time before beginning the second part of the sequence, indicating the preliminary course he is using for his honors work and the faculty member who has agreed to supervise his honors thesis.

*Administration.* This program will be administered by an honors advisor 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.

Staff

*Fall and Spring, 4 credits*

### **ECO 111 Applied Statistics I**

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. Prerequisite: ECO 100 or permission of instructor.

Mr. W. Dawes

*Fall, 3 credits*

**ECO 112 Applied Statistics II**

A continuation of ECO 111, covering elementary problems of simple and multivariate regression, analysis of variance and hypothesis testing. Regular problem sets are required. Prerequisite: ECO 111 or permission of instructor.

Mr. G. Schoepfle

*Spring, 3 credits*

**ECO 114 Economic Accounting**

An introduction to some formal accounting statements commonly involved in economic analysis. Topics covered 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.

*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 permission of instructor.

Mr. M. Kristein

*Fall, 3 credits*

**ECO 210 International Economics**

The course covers the theory of international trade, protection, commercial policy, customs unions, capital movements and international finance.

Prerequisite: ECO 100 or permission of instructor.

Mr. C. Staley

*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 permission of instructor.

Staff

*Fall and Spring, 3 credits*

**ECO 212 Intermediate Macroeconomic Theory**

The theory of national income determination, employment, distribution, price levels and growth.

Prerequisite: ECO 100 or permission of instructor.

Staff

*Fall and Spring, 3 credits*

**ECO 213 Institutional Economics**

A systematic analysis of the bases and common approaches of major institutionalist thinkers in their criticism and reconstruction of economic theory. The continuity of institutionalism as a parallel stream of thought challenging the orthodox tradition is explored in the writings of such men as Hobson, Veblen, Commons, Mitchell, Ayres, Polanyi, Myrdal and Galbraith.

Prerequisite: ECO 100 or permission of instructor.

Mr. J. Cornehl

*Fall, 3 credits*

**ECO 214 Economics of Socialism**

Analysis of the various approaches to the problems of translating Marxian socialist principles into functional economic institutions. Theoretical issues of socialism will be stressed, but will be illustrated with examples taken from the experience of various communist countries.

Prerequisite: ECO 100 or permission of instructor.

*Spring, 3 credits. Not offered 1969-70*

**ECO 215 Intermediate Mathematical Microeconomic Theory**

Same as ECO 211, but developed in mathematical terms.

Prerequisites: ECO 100, introductory differential calculus or permission of instructor.

Mr. M. Sakbani

*Fall, 3 credits*

**ECO 216 Intermediate Mathematical Macroeconomic Theory**

Same as ECO 212, but developed in mathematical terms.

Prerequisites: ECO 100, introductory differ-



ential calculus or permission of instructor.  
Mr. R. Dusansky  
*Spring, 3 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 permission of instructor.

Mr. G. Schoepfle  
*Spring, 3 credits*

### **ECO 233 Economics of Regulation and Control**

An examination of the structure of American industry and the deviations from competition with particular reference to governmental policy in this area. Criteria for the efficient control of prices, production and the flow of investment funds are analyzed.

Prerequisite: ECO 100 or permission of instructor.

*Fall, 3 credits. Not offered 1969-70*

### **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 permission of instructor.

*Spring, 3 credits. Not offered 1969-70*

### **ECO 237 Economics of Industrial and Labor Relations**

A study of the evolution of the labor unions; of 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 permission of instructor.

Mr. E. Kanovsky  
*Fall, 3 credits*

### **ECO 238 Economics of Manpower Planning**

Analysis of changing manpower requirements and labor force composition in the United States. Consideration of federal manpower development programs, educational responses to unemployment problems and American support of manpower planning and educational reform in developing countries.

Prerequisite: ECO 100 or permission of instructor.

Mr. D. Zschock  
*Fall, 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 permission of instructor.

*Spring, 3 credits*

### **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, etc.

Prerequisites: ECO 201, 211 or 215, 212 or 216, or permission of instructor.

Mr. M. Kristein  
*Spring, 3 credits*

**ECO 302 Economic Forecasting and Business Fluctuations**

Methods of short-run economic forecasting with emphasis on predictions of business fluctuations; turning point and quantitative forecasts; the causes of business fluctuations will be examined and different forecasting techniques will be analyzed.

Prerequisite: ECO 212 or 216 or permission of instructor.

Mr. H. Stekler

*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.

Prerequisites: ECO 211 or 215, 212 or 216, or permission of instructor.

Mr. R. Dusansky

*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.

Mrs. E. James

*Spring, 3 credits*

**ECO 311 History of Economic Thought**

A study of the evolution of economic thought with reference to the basic problems of the discipline: factor allocation, distribution, growth, etc. The major schools are emphasized in the survey.

Prerequisite: ECO 100 or permission of instructor.

Mr. J. Cornehl

*Fall, 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.

Mr. C. Staley

*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 and introductory knowledge of differential and integral calculus or permission of instructor.

Mr. G. Schoepfle

*Fall, 3 credits*

**ECO 321 Econometrics**

The application of mathematical and statistical methods to economic theory. Topics include: concept of an explanatory economic model; multiple regression; hypothesis testing; simultaneous equations models and estimating techniques. Emphasis is placed on the application of econometric methods to economic issues and the interpretation of various econometric studies.

Prerequisites: ECO 320 and introductory knowledge of linear algebra or permission of instructor.

Mr. W. Dawes

*Spring, 3 credits*

**ECO 322 Theory of Sampling and Survey Design**

The theory of replicated sampling; some sample functions and their properties; kinds of probability samples; sampling optimality; a priori constraints on sampling.

Prerequisites: ECO 100 and introductory

knowledge of mathematical or applied probability and statistics or permission of instructor.

Mr. M. Sakbani

*Spring, 3 credits*

### **ECO 325 Economic Development**

A study of the process and problems of economic growth. Models of economic growth are examined and both developed and underdeveloped economies are reviewed with a view to isolating key factors involved in the growth process.

Prerequisite: ECO 100 or permission of instructor.

Mr. E. Van Roy

*Fall, 3 credits*

### **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 permission of instructor.

Mr. E. Van Roy

*Spring, 3 credits*

### **ECO 331 Mathematical Foundations of Economics I**

Examination of those topics in set theory and linear algebra that are most relevant to economics.

Prerequisites: ECO 100 and introductory knowledge of differential and integral calculus or permission of instructor.

Mr. P. Kalman

*Fall, 3 credits*

### **ECO 332 Mathematical Foundations of Economics II**

Examination of those topics in analysis, linear and non-linear differential equations, convexity and n-variable real-valued functions that are most relevant to economics.

Prerequisite: ECO 331 or permission of instructor.

Mr. P. Kalman

*Spring, 3 credits*

### **ECO 333 Mathematical Foundations of Economics III**

Examination of topics in integration theory, n-variable vector-valued function theory and topology that are most relevant to economists. Prerequisite: ECO 332 or permission of instructor.

Mr. P. Kalman

*Fall, 3 credits*

### **ECO 334 Introduction to Optimality**

General optimization theory, local and global. Theory of linear programming, integral linear programming and non-linear programming. Elements of game theory.

Prerequisites: ECO 331 and 332 or permission of instructor.

Mr. J. Salpietro

*Fall, 3 credits*

### **ECO 335 Properties of Microeconomic Models**

Axiomatic foundation of consumer choice theory and production theory. Competitive equilibrium. Existence, uniqueness, optimality and stability of solutions to microeconomic models. Qualitative economics and dynamic systems.

Prerequisites: ECO 211 or 215, 332 or permission of instructor.

Mr. P. Kalman

*Spring, 3 credits*

### **ECO 339 Income Distribution**

The objective of this course is to provide an understanding of the distribution of personal income. Broadly, the topics to be examined are: neoclassical theory of distribution; the behavior of factor shares over time; theory of human capital, with emphasis on education; the ownership of physical capital; and distribution-related institutions, such as taxes, transfers and allocation of public expenditures.

Prerequisite: ECO 211 or 215 or permission of instructor.

Mr. L. Miller

*Fall, 3 credits*

### **ECO 340 Economics of Education**

Education as investment in human capital with concurrent problems of individual de-

cision-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.

Mr. L. Nordell

*Spring, 3 credits*

### **ECO 341 Political Economy of the United States**

A study of the role of economic interests in determining government economic policy. Motivation and impact of specific government programs are analyzed as well as more general theories of the state.

Prerequisite: ECO 211 or 215 or permission of instructor.

Mr. M. Zweig

*Fall, 3 credits*

### **ECO 343 Comparative Economic Systems**

A study of different types of economic systems, comparing structures, the ways basic economic problems of factor allocation and distribution are dealt with and the result achieved in output and growth.

Prerequisite: ECO 100 or permission of instructor.

Mr. E. Neuberger

*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.

Mr. R. Lekachman

*Fall, 3 credits*

### **ECO 346 Law and Poverty**

Continuing the analysis of ECO 345, this course will focus particularly upon the relations between economic poverty and legal arrangements. Among the topics to be examined will be the extent of the protection afforded by law to small debtors and poor tenants, the impact of welfare law upon the economic 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.

Mr. R. Lekachman

*Spring, 3 credits*

### **ECO 351 Economic Theory and Operations Research**

Presentation of the major conclusions of economic theory from the point of view of decision-making. Mathematical programming algorithms, activity analysis in production theory, input-output, investment and other static models.

Prerequisites: ECO 211 or 215, 212 or 216, introductory knowledge of differential calculus and linear algebra or permission of instructor.

Mr. M. Sakbani

*Fall, 3 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, introductory knowledge of calculus and linear algebra or permission of instructor.

Mr. M. Sakbani

*Spring, 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. During 1969-70 Economics of the Middle East (E. Kanovsky) will be offered in the spring 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. During 1969-70 Imperialism (M. Zweig) and Political Economy of Latin America (J. Cornehls) will be offered in the spring 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 391, 392 Senior Seminar in Economics**

The senior seminar will emphasize an examination of current research in the various areas of specialization in economics. In addition to the areas of the core courses, these may include econometrics, economic statistics, international trade, economic development, public finance, labor economics, economic history and the history of economic thought. The student will be required to prepare a paper demonstrating his acquaintance with, and command of, basic literature and research techniques. Prerequisite: Senior standing.

*Fall and Spring, 3 credits each semester*

### **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: ECO 100.

*Credit variable, course repeatable*

## DEPARTMENT OF EDUCATION

*Professors:* \*LEONARD GARDNER, MORTIMER KREUTER (*Director of Teacher Preparation*), \*FRANK R. PETERS

*Associate Professors:* AARON S. CARTON, JAMES E. HIGGINS, AARON LIPTON, ELI SEIFMAN (*Chairman*)

*Assistant Professors:* ALEX BASKIN, THEODORE A. BREDDERMAN, W. EUGENE HEDLEY, DELORES HUNTER, ANNIE MAE WALKER

*Instructors:* ESTHER GLASS, MARK GOLDBERG, EDWARD GOLDSTEIN, WILLIAM L. HOOVER, SHI MING HU, BARBARA LIEBHART, LOUIS MASLINOFF, MORTON MECKLOSKEY, ANTHONY W. RAY, LEONARD SACHS, JOAN SNYDER, LOUIS SPINELLI, MORTON P. STRASSBERG, ARTHUR R. WEDEMAYER

*Lecturers:* MARY HEILMAN, WANDA RIESZ, LOUIS WATTERSON

The Department of Education offers the student the opportunity to pursue a career and study in education by providing: 1) courses designed to forward the study of principles and issues in the field of education; 2) courses designed for the "professional study in education" component of the elementary and secondary teacher certification programs; and 3) practice and study in education in laboratory facilities maintained through cooperative arrangement with participating schools.

### COURSES IN EDUCATION

#### **EDU 101 Introductory Educational Practicum**

A series of seminars and teaching experiences intended to acquaint interested students with teaching in elementary and secondary schools. The course will be especially useful for those who are considering entering a teacher training program. Each student will work with children in local schools under the supervision of a faculty member. Seminars will be used to help students plan and evaluate lessons and deal with other practical problems of teaching. There will be approximately 15 hours of scheduled activities during the semester.

Prerequisite: Permission of instructor.

Staff

*Fall and Spring, 1 credit. (Course can be taken a maximum of three times.)*

\* On leave academic year 1969-70.

#### **EDU 150 Children's Literature**

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

Mr. J. Higgins

*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.  
 Mr. A. Baskin, Mr. E. Seifman  
*Fall, 3 credits*

### **EDU 162 History of Western Education**

An analysis of various approaches to the study of the history of western education through an examination of selected histories of education. Emphasis will be placed on developing an understanding of the materials 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. The semester will be devoted to the analysis of works dealing with the history of education during the ancient, medieval and early modern eras. Histories of education selected for study will be chosen from among the writings of such authors as Henri I. Marrou, E. B. Castle, William K. Medlin, Charles H. Haskins, Robert Ulich and others. This course is identical with

HIS 162.  
 Mr. A. Baskin  
*Spring, 3 credits*

### **EDU 201, 202 Psychological Foundations of Education**

The first semester of this course (201) will consist of a study of principles of psychology as they apply to elementary school education. Topics will include measurement and evaluation, aptitude and "readiness," cognition, problem solving, retention and transfer, motivation and socialization. In 202, the focus will shift to developmental theories and data and the topics of 201 will be re-examined in terms of growth from childhood to puberty. Particular attention will be given to the development of perception, cognition, problem solving, language and attitudes. Both 201 and 202 will require participation in data collection and analysis, case studies and observation of children in a variety of settings. Prerequisite: EDU 201 is prerequisite for EDU 202.

Mr. A. Carton and Staff  
*Fall and Spring, 3 credits each semester*



**EDU 203 Psychological and Social Foundations of Educational Theory**

An examination of theories drawn from psychology, sociology and anthropology as applied to adolescent behavior and the school environment. Writings of such researchers as: Erikson, Goodman, Henry, White, Wolfenstein.

Staff

*Fall and Spring, 3 credits*

**EDU 239, 240 Methods of Teaching Art to Children**

A studio course designed to present techniques of teaching art to children through an understanding of the creative process. Emphasis will be on the process one goes through in making a work of art and on the feeling of growth one experiences. Discussions of students' art experience and relevance of this experience as it concerns the child's creative process. Stress also on understanding the meaning of children's art, how to teach art to children and the importance of an art program in the schools. Current readings in art and education will be studied and discussed. Lectures given on child art. EDU 240 is identical with ART 240.

Prerequisite: EDU 239 is prerequisite for EDU 240.

ART 240.

Miss J. Snyder

*Fall and Spring, 3 credits each semester*

**EDU 250 Current Social Issues in American Education**

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

Mr. L. Spinelli

*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 upon 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.

Mrs. A. Walker

*Fall and Spring, 3 credits*

**EDU 252 Education for Diverse Student Populations**

This course is designed to explore methods, materials, attitudes and general curricula problems and directions for prospective teachers. While most of the content would be applicable to understanding and teaching children from any background, an attempt will be made to concentrate attention on concern about the education of children who live in urban ghetto areas.

Mr. A. Lipton

*Fall and Spring, 3 credits*

**EDU 310 Secondary Language Arts Curriculum Development: Practicum-Colloquium**

A survey of the current responsibilities of the secondary school teacher of English, an examination of resource materials for teacher-made lessons and lesson sequences, and the creation and presentation of language arts materials. Course emphasis will be on the appraisal of selected English classes in local schools and the creation of brief, practical curricular sequences for these classes. Students will either teach or observe the teaching of all or part of their own material in cooperating school districts.

Mr. M. Goldberg

*Spring, 3 credits*

**EDU 321 Foreign Languages in the Elementary Schools: Theory, Methods and Materials**

An examination of the reasons for a Foreign Language in the Elementary Schools (FLES) and a study of current FLES curricula with a focus on the questions of when FLES should start, who should participate, which languages should be taught, who should teach FLES, and FLES articulation within the school system. Various methods of FLES instruction, including the audio and/or lingual approach, the linguistic approach, the use of

the language laboratory, and the place of reading and writing in a FLES program will be examined. Emphasis will be put also on techniques of teaching English as a foreign language for children in the schools in the New York area. Weekly demonstration lessons with a class of elementary pupils and self-critiques will also be a part of the course. Prerequisite: Permission of instructor and/or two-year foreign language proficiency.

Mrs. W. Riesz

*Fall and Spring, 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.

Mr. A. Carton

*Fall and Spring, 3 credits*

### **EDU 330 Foundations of Elementary School Mathematics and Science Curriculum**

An examination and evaluation of present and prospective elementary math and science curriculum materials with special emphasis on their classroom application. Students will select materials from the more widely known curriculum projects and use them in classrooms of local schools. They will also develop and use their own curriculum materials. Individualized workshops and group seminars will be employed to analyze materials with a view toward defining principles of elementary math and science curriculum design and use.

Prerequisite: Permission of instructor.

Mr. T. Bredderman, Mr. M. Mecklosky

*Fall and Spring, 3 credits*



### **EDU 331 Instructional Programming I**

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

Prerequisite: Permission of instructor.

Mr. E. Lambe

*Fall, 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: Senior standing.

Mr. W. Hedley, Mr. P. Hill, Mr. H. Zyskind

*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.

Mr. M. Kreuter and Staff

*Fall and Spring, 12 credits*

### **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.

Prerequisites: Junior standing and approval of director of teacher preparation.

Staff

*Fall and Spring, 6 credits*

### **EDU 352 Supervised Elementary School Student Teaching**

Prospective elementary school teachers will receive supervised practice in teaching at the elementary school level by arrangement 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.

Mr. M. Kreuter and Staff

*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.

Staff

*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.

Staff

*Fall and Spring, 3 credits*

### **EDU 360 Literature and Story-Telling for the Pre-School and Primary Grades**

A consideration of literary materials appropriate for children in nursery schools, kindergarten and early elementary grades. Special attention is given to story-telling arts and promising practices using literature with young children.

Prerequisite: Permission of instructor.

Mr. J. Higgins

*Spring, 3 credits*

### **EDU 361 Teaching Children's Literature in the Intermediate Grades**

A consideration of literary materials appropriate for children in the intermediate grades of elementary school. Special attention is given to issues and problems relating to the formulation of knowledge about children's literature and promising practices in using literature with school groups.

Prerequisite: Permission of instructor.

Mr. J. Higgins

*Fall, 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.

Prerequisite: Permission of instructor.

Mr. A. Lipton

*Fall and Spring, 3 credits*

### **EDU 365 Workshop in Teaching Reading for Elementary School Teachers**

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

Prerequisite: Permission of instructor.

Mr. A. Lipton

*Fall and Spring, 3 credits*

### **EDU 366 Seminar in Research in the Field of Reading**

This course is designed to give teachers (elementary and secondary), administrators and reading specialists a view of the field of reading in reference to an understanding of the research (past, present and future) on a variety of issues currently facing the educator. The issues which will be investigated are: linguistics and reading; beginning reading programs; reading and perceptual training; methodologies and the teaching of reading; causes of reading disability; the decoding process; evaluation processes, and a critique of research design and methodology in the field of reading.

Prerequisite: Permission of instructor.

Mr. A. Lipton

*Fall and 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.

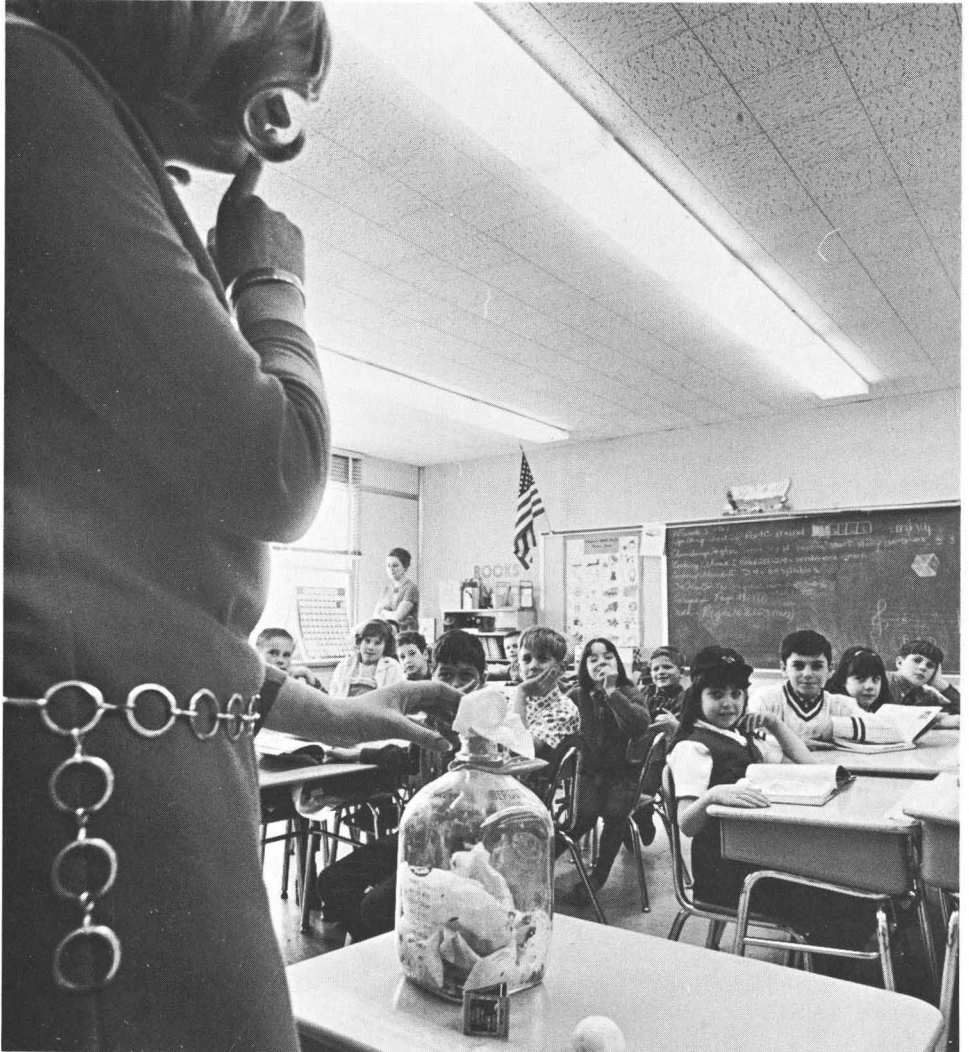
Prerequisite: Permission of instructor.

Mr. E. Seifman

*Fall and Spring, 4 credits*

## INTERDISCIPLINARY PROGRAM IN ELEMENTARY EDUCATION

For a description of the requirements of this interdisciplinary major program, see the section of this *Bulletin* entitled Elementary and Secondary Teacher Certification Program. For further information, consult the program chairman, Professor Mortimer Kreuter, who is also the director of teacher preparation.



## DEPARTMENT OF ENGLISH

*Professors:* THOMAS ALTIZER, DAVID W. D. DICKSON, DAVID ERDMAN, \*ALFRED KAZIN, THOMAS KRANIDAS, RICHARD L. LEVIN, JACK LUDWIG, IRVING RIBNER (*Chairman*), LOUIS SIMPSON, MARTIN STEVENS, JOHN THOMPSON, HERBERT WEISINGER

*Associate Professors:* EDWARD FIESS, DONALD FRYE, HOMER GOLDBERG, RICHARD LEVINE, THOMAS MARESCA, RUTH MILLER, PETER F. NEUMEYER, JOSEPH PEQUIGNEY, THOMAS ROGERS, JUDAH L. STAMPFER, ROSE ZIMBARDO

*Assistant Professors:* KENNETH ABRAMS, FRANK ANSHEN, KOFI AWOONOR, JOSEPH BENNETT, WILLIAM CARPENTER, PAUL DOLAN, JANET EGLESON, DIANE FORTUNA, BEATRICE HALL, HOWARD J. HARVEY, GERALD NELSON, PAUL NEWLIN, GEORGE PETTY, JONAH RASKIN, SALLIE SEARS, PETER SHAW, ALICE WILSON

*Instructors:* CLAUDETTE CHARBONNEAU, JERRY DIBBLE, CATHERINE GILES, JOHN W. HALPERIN, STEPHEN KOCH, YEHUDY LINDEMAN, JACKIE PRITZEN, GEORGE QUASHA, EARL G. SCHREIBER

*Administrative Assistant (Faculty):* THOMAS GATTEN

### Requirements for the Major in English

English 101 is the normal prerequisite to sophomore standing as a major in the department.

In addition to the general university requirements for the bachelor of arts degree, the following courses are the requirements for the major in English:

1. Tutorial in English Studies  
A student must register for one of these courses each semester that he is a declared major in English. The courses are numbered 194-199.
2. EGL 241 (*Shakespeare*)
3. Five additional courses in the department numbered 200-299, of which one must be from those numbered 200-211, one from those numbered 212-239, one from those numbered 240-259, one from those numbered 260-279 and one from those numbered 280-289.
4. One year of study in a foreign *literature* in its original language.

Note: students seeking Teacher Certification must include EGL 280 (*The English Language*) or EGL 281 (*History and Structure of the English Language*).

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\*On leave academic year 1969-70.



## COURSES IN ENGLISH

The courses described below and similar courses will be presented according to schedules published before registration. The department expects that all courses will be offered at least once every two years. Most courses are offered more frequently. The schedules contain full descriptions of the courses and reading lists are published before registration. Courses with the same number may be repeated when the content varies. Course content will be indicated on transcripts.

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### I. THE CRAFT OF WRITING

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#### EGL 101 Composition

A course in writing. The course aims to develop abilities in expository and argumentative writing and may be taken to satisfy the university requirement for proficiency in composition. Each section is limited to ten students. 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 opinion, in accordance with the required university standards.

Staff

*Fall and Spring, 3 credits*

#### EGL 103, 104 The Practice of Literary Criticism I, II

The application of the principles of literary criticism to specific texts combined with the composition of critical essays for analysis.

Mr. G. Quasha

*Fall and Spring, 3 credits each semester*

#### EGL 105, 106 Writing Workshop I, II

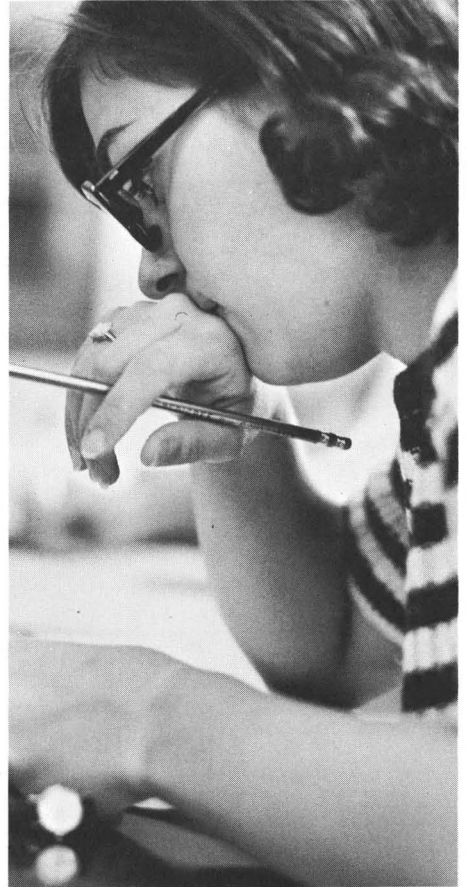
A workshop in the development of writing skills through practice supplemented by readings.

Mr. T. Gatten

*Fall and Spring, 3 credits each semester*

#### EGL 107, 108 The Exposition of Scientific Ideas I, II

Training in the exposition of scientific terms and ideas in language comprehensible to the



educated layman by means of readings, the writing of papers and critiques.

Staff

*Fall and Spring, 3 credits each semester*



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## II. UNIVERSITY LECTURES IN LITERATURE

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These courses present lectures on major literary subjects by distinguished writers and scholars. The courses are open for registration to undergraduate and graduate students from all departments, to all members of the University, its employees and their families, and to the community.

The lectures are given once each week throughout the semester. In addition to attending the two-hour lecture, students taking the course for credit meet one hour a week with the staff of the University Lectures, for discussion, analysis of their papers and examinations. The work of the graduate student for the course is supervised directly by the University Lecturer.

### EGL 110, 111 The Experience of Literature I, II

Lectures on the major types of literature, in explanation of the form and content of poetry, prose fiction and drama, as seen in outstanding works of each type. Intensive discussion and criticism of writing work by students, conducted in small sections.

Mr. K. Awoonor

*Fall and Spring, 3 credits each semester*

### EGL 120, 121 The Great Tradition I, II

Lectures on the great works of the past which have formed the culture of Europe: Homer, Aeschylus, Sophocles, Euripides, Plato, Aristotle, Virgil, Lucretius, St. Augustine, Dante, Rabelais, Cervantes and others. Intensive discussion and criticism of written work by students conducted in small sections.

Staff

*Fall and Spring, 3 credits each semester*

### EGL 130, 131 Shakespeare I, II

Lectures on the works of Shakespeare and their significance as major interpretations of the human experience. Intensive discussion and criticism of written work by students, conducted in small sections.

Mr. H. Weisinger

*Fall and Spring, 3 credits each semester*

### EGL 140, 141 The Aspiration toward the Divine in Literature I, II

Lectures on the relations between the gods and men in Oriental thought and literature from myth to the death of God movement. Intensive discussion and criticism of written work by students, conducted in small sections.

Mr. T. Altizer

*Fall and Spring, 3 credits each semester*

### EGL 150, 151 Literature of the Twentieth Century I, II

Lectures on the chief works of our own time in poetry, fiction and drama which have revolutionized the traditional modes of thought and experience. Intensive discussion and criticism of written work by students, conducted in small sections.

Mr. J. Ludwig

*Fall and Spring, 3 credits each semester*

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## III. TUTORIALS IN ENGLISH

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### EGL 194, 195, 196, 197, 198, 199 Tutorial in English Studies

Each English major has a tutor. The tutor directs the student's work throughout the sophomore, junior and senior years, both as advisor in charge of the student's entire program and as a teacher who conducts a central part of the student's formal work in English literature, in writing and in independent studies.

Students may change tutorial sections at the end of the sophomore year.

Tutorials meet in small groups or in conference. The sophomore tutorial normally is directed to an understanding of the major types of literature in poetry, fiction and drama. In the junior and senior years the student and his tutor plan and carry out increasingly independent studies in research and in writing.

Students' work in tutorial in English is recorded on the following basis: H (Honors), S (Satisfactory), U (Unsatisfactory).

Staff

*Fall and Spring, 3 credits each semester*

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#### IV. THE LITERARY TRADITION OF ENGLAND AND AMERICA

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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.

There are no prerequisites for any of these courses nor are there prescribed sequences. However, the courses are planned so that they may be taken consecutively as one-year courses if the student wishes to do this.

##### **EGL 200 Old English Literature**

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

Mr. G. Petty

*Fall and Spring, 3 credits*

##### **EGL 202, 203 Medieval Literature in English I, II**

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

Mr. G. Petty and Mr. E. Schreiber

*Fall and Spring, 3 credits each semester*

##### **EGL 204, 205 Renaissance Literature in English I, II**

The study of English literature of the Renaissance.

Mr. J. Stampfer

*Fall and Spring, 3 credits each semester*

##### **EGL 206, 207 English Literature of the Seventeenth Century I, II**

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

Miss C. Charbonneau

*Fall and Spring, 3 credits each semester*

##### **EGL 208, 209 The Age of Dryden I, II**

The study of the English literature of the Restoration period.

Staff

*Fall and Spring, 3 credits each semester*

##### **EGL 210, 211 Neo-Classical Literature in English I, II**

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

Mr. H. Goldberg

*Fall and Spring, 3 credits each semester*

##### **EGL 212, 213 Romantic Literature in English I, II**

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

Mr. K. Abrams

*Fall and Spring, 3 credits each semester*

##### **EGL 214, 215 Victorian Literature I, II**

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

Mr. J. Bennett, Mr. J. Halperin

*Fall and Spring, 3 credits each semester*

##### **EGL 216 American Colonial and Federal Writers**

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

Staff

*Fall and Spring, 3 credits*

##### **EGL 218, 219 The New England Imagination I, II**

The study of American literature from the period of the American Colonial and Federal Writers to the Era of the American Romancers.

Miss R. Miller

*Fall and Spring, 3 credits each semester*

##### **EGL 220, 221 American Romancers I, II**

The study of American literature from the period of the New England Imagination to the Realist Movement.

Staff

*Fall and Spring, 3 credits each semester*

**EGL 222, 223 The Realist Movement in America I, II**

The study of American literature from the period of the American Romancers to the Modern Movement.

Mr. E. Fiess

*Fall and Spring, 3 credits each semester*

**EGL 224, 225 Modern English and American Literature I, II**

The study of English and American literature from the end of the Victorian era to World War II.

Miss S. Sears, Mr. J. Raskin

*Fall and Spring, 3 credits each semester*

**EGL 226, 227 Contemporary English and American Literature I, II**

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

Mr. G. Nelson, Mr. P. Newlin

*Fall and Spring, 3 credits each semester*

**V. 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 before each registration period. The list below is representative.

**EGL 240 Chaucer**

Intensive study in the works of Chaucer.

Mr. E. Schreiber

*Fall and Spring, 3 credits*

**EGL 241 Shakespeare**

Intensive study in the works of Shakespeare.

Mr. I. Ribner, Mr. R. Levin, Mr. H. Harvey

*Fall and Spring, 3 credits*

**EGL 242 Milton**

Intensive study in the works of Milton.

Staff

*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.

Staff

*Fall and Spring, 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.

Mr. Y. Lindeman

*Fall and Spring, 3 credits*

**EGL 245 Major Writers of the Seventeenth Century in England**

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

Staff

*Fall and Spring, 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.

Staff

*Fall and Spring, 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.

Staff

*Fall and Spring, 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.

Mr. D. Erdman

*Fall and Spring, 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.

Mr. R. Levine

*Fall and Spring, 3 credits*

**EGL 250 Major Writers of Earlier American Literature**

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

Staff

*Fall and Spring, 3 credits*

**EGL 251 Major Writers of Later American Literature**

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

Mr. J. Halperin

*Fall and Spring, 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.

Mrs. D. Fortuna, Mr. J. Raskin

*Fall and Spring, 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.

Staff

*Fall and Spring, 3 credits*

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**VI. THE MODES AND FORMS OF LITERATURE**

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These courses, and others like them offered from time to time, provide special studies in regional literature, genres of literature and other topics. Detailed descriptions and reading lists are published before registration.

**EGL 191 Interpretation of Poetry**

Intensive analysis of poems in English of various periods and types and varying complexity. (Not for English major credit)

Mr. K. Awoonor, Mr. G. Quasha

*Fall and Spring, 3 credits*

**EGL 192 Interpretation of Fiction**

Analysis of stylistic and structural modes employed by various writers of short stories and novels. (Not for English major credit)

Mrs. C. Giles, Mr. P. Shaw

*Fall and Spring, 3 credits*

**EGL 193 Interpretation of 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)

Mr. H. Harvey

*Fall and Spring, 3 credits*

**EGL 260 Mythology in Literature**

The study of the dissemination and use of mythological motifs and themes in English and American literature.

Mrs. A. Wilson

*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.

Staff

*Fall and Spring, 3 credits*

**EGL 262, 263 Poetry in English I, II**

The study of the development of form, theme and language of poetry in English.

Mr. L. Simpson

*Fall and Spring, 3 credits each semester*

**EGL 264, 265 Drama in English I, II**

The study of the development of plot, structure, character, setting, theme and language of drama in English.

Staff

*Fall and Spring, 3 credits each semester*

**EGL 266, 267 Fiction in English I, II**

The study of the development of plot, structure, character, theme and language of fiction in English.

Mrs. J. Egleson, Mrs. D. Fortuna, Mr. J. Dibble

*Fall and Spring, 3 credits each semester*

**EGL 268, 269 Prose in English I, II**

The study of the various forms of prose such as the essay, utopias, memoirs, autobiography, biography and non-fictional narrative.

Staff

*Fall and Spring, 3 credits each semester*

**EGL 270, 271 History of Literary Criticism I, II**

Analytic survey of major texts in the history of European literary theory and criticism.

Mr. J. Bennett

*Fall and Spring, 3 credits each semester*

**EGL 272, 273 Literature in English in its Relations to Other Literatures I, II**

The study of literature in English as it affects and is affected by other literatures.

Mrs. J. Egleson

*Fall and Spring, 3 credits each semester*

**EGL 274, 275 Literature in English in its Relations to Other Disciplines I, II**

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.

Staff

*Fall and Spring, 3 credits each semester*

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**VII. LANGUAGE AND LINGUISTICS**

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**EGL 280 The English Language**

A linguistic approach to the syntax of contemporary English.



Mrs. B. Hall, Mr. F. Anshen  
*Fall and Spring, 3 credits*

**EGL 281 History and Structure of the English Language**

Beginning with an introduction to phonology, this course traces the development of the English language from Pre-Germanic times to the present day.

Mrs. B. Hall  
*Fall and Spring, 3 credits*

**EGL 282 Non-Standard 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.

Mr. F. Anshen  
*Fall and Spring, 3 credits*

**EGL 283 Mathematical Aspects of Linguistics**

This course will be an introduction to the mathematical concepts and procedures which underlie much contemporary linguistic practice.

Staff  
*Fall and Spring, 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.

Mrs. B. Hall  
*Fall and Spring, 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.

Staff  
*Fall and Spring, 3 credits*

**EGL 286 Introduction to Socio-Linguistics**

This course will provide an introduction to the interaction between language and society. Examples will be drawn largely from the New York City area.

Staff  
*Fall and Spring, 3 credits*

**EGL 287 Morphological Analysis**

An introduction to the methods of morphological and morphophonemic analysis.

Staff  
*Fall and Spring, 3 credits*

**EGL 288 Discourse Analysis of English**

An investigation of the principal theories of grammatical constraints of units larger than the sentence.

Staff  
*Fall and Spring, 3 credits*

**VIII. 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 genuine literary values to high school students.

Mr. P. Neumeyer  
*Fall and Spring, 3 credits*

**EGL 291 Senior Honors Seminar I**

Advanced intensive study of a special literary topic in preparation for the independent work of EGL 292.

Mr. J. Pequigney  
*Fall, 3 credits*

**EGL 292 Senior Honors Seminar II**

Intensive inquiry and independent study culminating in an honors essay.

Mr. J. Pequigney  
*Spring, 3 credits*

## DEPARTMENT OF GERMANIC AND SLAVIC LANGUAGES AND LITERATURES

*Professors:* \*DENNIS GREEN, \*MICHAEL HAMBURGER, ROMAN KARST, JAN KOTT

*Associate Professors:* LEIF SJÖBERG, ANDREW WHITE (*Chairman*)

*Assistant Professors:* SAMUEL BERR, RUSSELL E. BROWN, ANTHONY R. HIPPISELY,  
MORTON NIRENBERG, DANIEL C. O'NEIL, PHILIPPE RADLEY, FERDINAND  
A. RUPLIN, JOHN R. RUSSELL, ELISABETH STENGEL, LUCY VOGEL

*Instructors:* ANNE-MARIE BERGGREN, BARBARA E. ELLING, ELISABETH C. GLADIR,  
HELEN JACOBSON, BRIAN T. REGAN, NINA THOMPSON

### Requirements for the Major in Germanic and Slavic Languages and Literatures

#### A. Germanic Languages and Literatures

In addition to the general university requirements for the bachelor of arts degree, the following courses are required for the major in Germanic languages and literatures:

	CREDITS
(I) GER 181 ( <i>Methodology I</i> )	3
(II) GER 281, 282 ( <i>Special Century Studies</i> )	6
(III) GER 331 ( <i>Special Periods</i> )	3
(IV) GER 332 ( <i>History of the German Language</i> )	3
(V) GER 333 ( <i>Special Author</i> )	3
(VI) GER 334 ( <i>Methodology II</i> )	3
(VII) GER 335, 336 ( <i>Goethe</i> )	6
	27

The curriculum for the major in Germanic languages has been designed to afford the student maximum flexibility of choice from the greatest number of literature and language offerings. The spectrum of offerings in literature has been made as wide as possible so that the student can plan his own curriculum following his interests and talents. "Courses" in the traditional sense are not offered, being replaced by options. Teaching for the major will take place mainly in tutorials and seminars.

The ascending numbers of the required options for the major are intended to indicate the sequence in which, in the opinion of the department, these offerings might most favorably be studied. However, after consultation and agreement

\* In residence 1970-71.





with his tutorial advisor in the department, a student may choose to take the options in a different order.

The following courses are strongly recommended for majors in Germanic languages and literatures:

FLA 239 (*Methods and Materials in the Teaching of Foreign Languages*)

GER 321, 322 (*Advanced German Conversation and Composition*)

GER 338 (*Comparative Literature*)

GER 190 (*The Genealogy of the Modern Drama*)

GER 337 (*Greek Tragedy and the Modern Theatre*)

A course in a period or century of English literature

Courses in a second language

Courses in the literature of a second language

#### B. Slavic Languages and Literatures

In addition to the general university requirements for the bachelor of arts degree, the following courses are required for the major in Slavic languages and literatures:

LANGUAGE		CREDITS
(I) RUS 111, 112	<i>(Elementary Russian)</i>	6
(II) RUS 113, 114	<i>(Russian Conversation and Composition I)</i>	6
(III) RUS 151	<i>(Intermediate Russian)</i>	3

(IV) RUS 153, 154 ( <i>Russian Conversation and Composition II</i> )	6
(V) RUS 221, 222 ( <i>Conversation and Composition III</i> )	6
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## LITERATURE

(I) RUS 181 ( <i>History of Russian Literature</i> )	3
(II) RUS 231 ( <i>Methodology</i> )	3
(III) RUS 281, 282 ( <i>Special Century Studies</i> )	6
(IV) RUS 331 ( <i>Special Period and Genre Studies</i> )	3
(V) RUS 333 ( <i>Special Author I</i> )	3
(VI) RUS 334 ( <i>Special Author II</i> )	3
	<hr/> 21

## RELATED AREAS

Course work in related areas is no longer obligatory, but it is strongly recommended that 21 credits be earned in at least three of the following fields:

- (I) Second and additional languages
- (II) Second and additional literatures
- (III) HIS 241, 242 (Russian history)
- (IV) RUS 342 (*History of the Russian Language*)
- (V) RUS 321, 322 (*Conversation and Composition IV*)
- (VI) RUS 341 (*Research Methods*)
- (VII) Linguistics or methods
- (VIII) Comparative literature
- (IX) Philosophy (relevant courses)
- (X) Political science (relevant courses)
- (XI) Economics (relevant courses)

The curriculum for the major in Slavic languages has been designed to afford the student maximum flexibility of choice from the greatest number of literature and language offerings. The spectrum of offerings in literature has been made as wide as possible so that the student can plan his own curriculum following his interests and talents. "Courses" in the traditional sense are not offered, being replaced by options. Teaching for the major will take place mainly in tutorials and seminars.

The ascending numbers of the required options for the major are intended to indicate the sequence in which, in the opinion of the department, these offerings might most favorably be studied. However, after consultation and agreement with his tutorial advisor in the department a student may choose to take the options in a different order.

A second foreign language is strongly recommended, but not obligatory for the bachelor of arts degree. A student may earn some of his related area credits in a second foreign language, but it should be remembered that six of these 21 credits must be earned in senior level courses.

### Teaching Certification

Students who wish to prepare for certification as secondary school teachers must take the courses in education required for certification. They will also be required to earn six credits in a conversation and composition course in the language they intend to teach. (For further details concerning certification, see *Bulletin* section: Elementary and Secondary Teacher Certification.)

### 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; 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

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).

Mr. F. Ruplin and staff

*Fall and Spring, 4 credits each semester*

### GER 115, 116 Scientific German and Technical Translation

This course is designed to teach the student to read and translate German scientific prose of moderate difficulty. Practice in translating from German into English and in transferring ideas into the appropriate technical terminology. This course is not intended to prepare the student for the major.

Mr. M. Nirenberg

*Fall and Spring, 3 credits each semester*

### GER 151, 152 Intermediate German

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.

Prerequisites: GER 111, 112 or equivalent.  
Mr. J. Russell and staff

*Fall and Spring, 3 credits each semester*

### GER 181 Methodology I

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: Permission of instructor.

Mr. M. Nirenberg

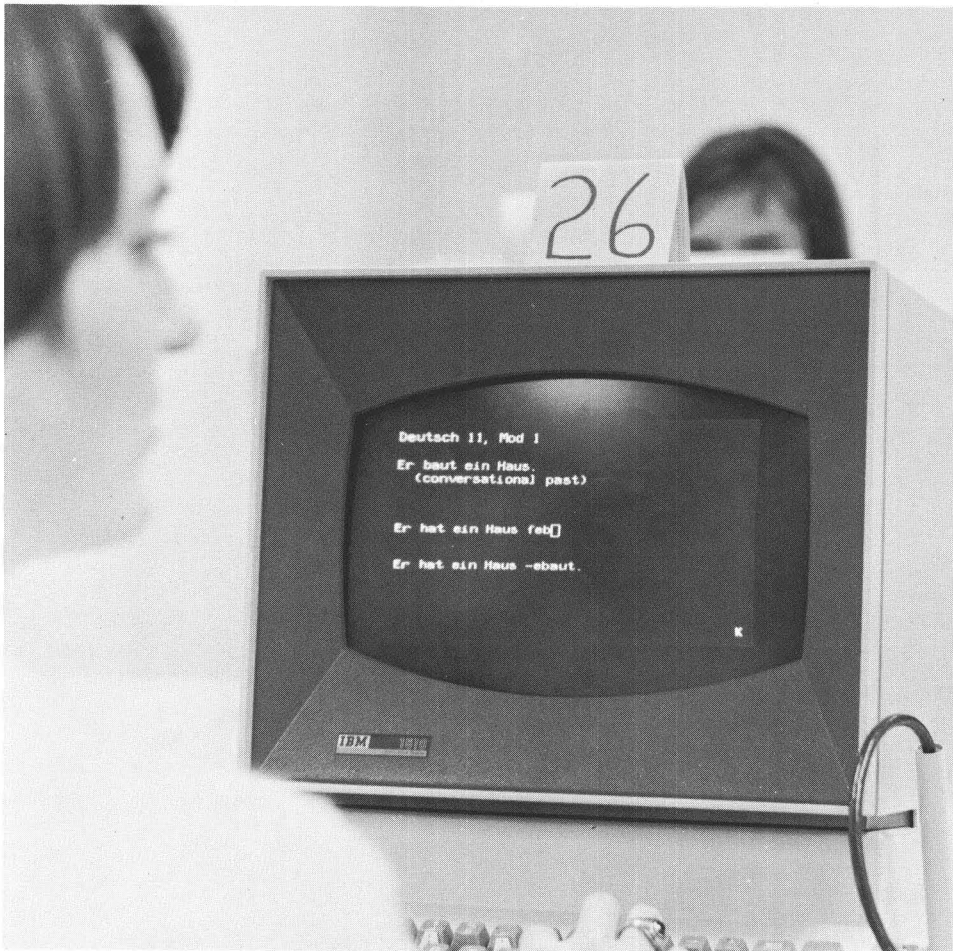
*Spring, 3 credits*

### GER 190 The Genealogy of the Modern Drama

A course in the University Lecture series alongside which there will be seminars for those students taking the course for credit. The course will deal with the evolution of the theatre from its earliest manifestations to modern times.

Mr. J. Kott and staff

*Fall, 3 credits*



### **GER 221, 222 German Conversation and Composition**

This course consists of the active use of spoken and written German. At least one hour per week of work in the language laboratory is required.

Prerequisites: GER 152 or language "proficiency" or equivalent and permission of instructor.

Mrs. B. Elling

*Fall and Spring, 3 credits each semester*

### **GER 281, 282 Special Century Studies**

Readings in German literature from any one of the following periods: The Middle Ages, 1500-1600, 1600-1748, 1749-1832, 1832-1889, 1890-present day. Taught by tutorial method and/or seminar.

Prerequisite: At least sophomore status or permission of instructor. Open also to non-majors with permission of instructor.

Mr. R. Karst, Mr. F. Ruplin, Mr. J. Russell, Mr. A. White, Mr. M. Nirenberg, Mr. D. O'Neil, Miss E. Stengel

*Fall and Spring, 3 credits each semester*

**GER 283, 284 Master Works of German Literature**

Readings in German literature in translation from the Middle Ages to the present day, such as *Tristan und Isolde*, *Simplicissimus*, *Nathan the Wise*, *Sorrows of Young Werther*, *Faust I and II*, *From the Life of a Ne'er Do Well*, *Green Henry*, *Effi Briest*, *Duino Elegies*, *Doctor Faustus*, *Tin Drum*, *The Deputy*, *Marat/Sade*.

Mrs. B. Elling

*Fall and Spring, 3 credits each semester*

**GER 312 Modern Scandinavian Novel**

(For course description, see Courses in Scandinavian Languages and Literature.)

**GER 321 Advanced German Conversation and Composition**

A course designed to develop mastery of spoken German. Students will learn to express themselves idiomatically and fluently. At least two hours of weekly laboratory practice will be required.

Prerequisites: GER 221, 222 or junior or senior standing and permission of instructor.  
Miss E. Stengel

*Fall, 3 credits*

**GER 322 Advanced German Conversation and Composition**

A course designed to acquaint students with the subtleties of German grammar and style. Extensive practice in written German.

Prerequisites: GER 221, 222, or junior or senior standing and permission of instructor.  
Miss E. Stengel

*Spring, 3 credits*

**GER 331 Special Periods**

Readings in German literature of any one of the following periods or genres: Minnesang, Carolingian epic, medieval mysticism, Renaissance, baroque, mannerism, enlightenment, Sturm und Drang, romanticism, Biedermeier, young Germany, realism, naturalism, expressionism, German comedy: Gryphius to Hofmannsthal; German tragedy: Lessing to Hebbel;

bel; German novelle, twentieth century epic, the German epic, German history: 1800-present day. Taught by tutorial method and/or seminars.

Prerequisite: Junior status or permission of instructor.

Mr. F. Ruplin, Mr. J. Russell, Mr. D. O'Neil, Mr. R. Brown, Mr. A. White

*Fall and Spring, 3 credits*

**GER 332 History of the German Language**

The development of the German language from Indo-European to modern High German. While special emphasis will be placed on western Germanic languages, specifically German, some attention will be given to the Scandinavian languages and Gothic. The framework within which work will be done will be that of modern linguistic theory (generative-transformational phonology). A historically representative selection of texts will be examined. Taught by tutorial method and/or seminar.

Prerequisite: Junior or senior status or permission of instructor.

Mr. S. Berr

*Fall and Spring, 3 credits*

**GER 333 Special Author**

The purpose of this course is to study the works of the author chosen and also relevant scholarly criticism. Students may choose one of the following: Gottfried von Strassburg, Walther von der Vogelweide, Wolfram von Eschenbach, Hartmann von Aue, Der Stricker, Andreas Gryphius, Angelus Silesius (J. Scheffler), Grimmshausen, Klopstock, Lessing, Schiller, Friedrich Schlegel, Novalis, E. T. A. Hoffmann, Heine, Börne, Keller, Büchner, Fontane, Hauptmann, Hofmannsthal, George, Rilke, Musil, Broch, Thomas Mann, Max Frisch, H. v. Doderer, Brecht. Taught by tutorial method and/or seminars. Prerequisite: Senior status or permission of instructor. Open to non-majors by permission of instructor.

Mr. R. Karst, Mr. A. White, Miss E. Stengel, Mr. R. Brown, Mr. F. Ruplin

*Fall and Spring, 3 credits*

**GER 334 Methodology II**

An introduction to the techniques used in the scholarly criticism of literature. Students in this course will be trained to familiarize themselves with and use the apparatus of literary scholarship.

Prerequisite: Senior status or permission of instructor.

Miss E. Stengel

*Fall and Spring, 3 credits*

**GER 335, 336 Goethe**

Reading and interpretation of the most important works by Goethe, including the poems, plays and novels. These will be studied against the background of Goethe's life and times.

Prerequisite: Senior status or permission of instructor.

Mr. R. Karst

*Fall and Spring, 3 credits each semester*

**GER 337 Greek Tragedy and the Modern Theatre**

The course will be conducted as a seminar and will deal with the impact and influence of Greek tragedy in modern drama from Racine to Brecht. This course is identical with THR 337.

Prerequisite: Permission of instructor.

Mr. J. Kott

*Fall, 3 credits*

**GER 338 Introduction to Comparative Literature**

This course will introduce the student to an understanding of what comparative literature means and what it involves.

Prerequisite: Senior status or permission of instructor.

Mr. A. White

*Fall and Spring, 3 credits*

**COURSES IN SCANDINAVIAN LANGUAGES AND LITERATURE****SWE 114, 115 Elementary Swedish**

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.

Mrs. A. M. Berggren and staff

*Fall and Spring, 3 credits each semester*

**SWE 151, 152 Intermediate Swedish**

The reading and interpretation of Swedish texts, with a review of Swedish grammar, composition and conversation.

Prerequisites: SWE 114, 115.

Mr. L. Sjöberg and staff

*Fall and Spring, 3 credits each semester*

**GER 312 Modern Scandinavian Novel**

The "great" tradition in the Scandinavian novel of the nineteenth century, covering major historic, political and economic changes

during the same period. Works to be read and discussed by Hans C. Andersen, Kierkegaard, Strindberg, Kivi, Lagerlöf, Heidenstam, Hamsun, J. P. Jacobsen and others. Of twentieth century works, major novels by the Nobel laureates Undset, Lagerkvist and Laxness will be discussed. This course is open to all undergraduates.

Mr. L. Sjöberg

*Spring, 3 credits*

**GER 367 Modern Scandinavian Drama**

Plays of Ibsen and Strindberg will be read and discussed in English in the context of European naturalism and subsequent anti-naturalist tendencies and as a major continuing influence on modern drama. Among more recent Scandinavian dramatists, Pär Lagerkvist will be considered. This course is open to all undergraduates.

Mr. L. Sjöberg

*Fall, 3 credits*

**COURSES IN SLAVIC LANGUAGES AND LITERATURES****RUS 111, 112 Elementary Russian**

An introduction to written Russian stressing reading, writing and grammar. Class work will be supplemented by practice in the language laboratory.

Mrs. H. Jacobson and staff

*Fall and Spring, 3 credits each semester*

**RUS 113, 114 Russian Conversation and Composition I**

An introduction to spoken Russian, stressing pronunciation, speaking and listening comprehension.

Corequisite: RUS 111, 112.

Mrs. L. Vogel and staff

*Fall and Spring, 3 credits each semester*

**RUS 147, 148 Intermediate Russian (Reading)**

An intermediate course in the reading and translating of Russian texts in the humanities, sciences and social sciences. This course stresses a passive command of Russian and is intended for non-majors.

Prerequisite: RUS 112 or equivalent.

Mrs. H. Jacobson

*Fall and Spring, 3 credits each semester*

**RUS 151 Intermediate Russian**

An intermediate course in Russian grammar, stressing an active command of Russian.

Prerequisites: RUS 112 and RUS 114 or equivalent.

Corequisite: RUS 153.

Mr. A. Hippisley and staff

*Fall, 3 credits*

**RUS 153, 154 Russian Conversation and Composition II**

A course in the active use of spoken and written Russian. This course is conducted in Russian.

Prerequisites: RUS 112 and RUS 114 or equivalent.

Corequisite: RUS 151.

Mrs. N. Thompson and staff

*Fall and Spring, 3 credits each semester*

**RUS 181 History of Russian Literature**

This course is designed to give a historical survey of Russian literature. Selected works of the most important writers will be read in translation. The course is open to all undergraduates.

Mr. P. Radley

*Fall, 3 credits*

**RUS 221, 222 Conversation and Composition III**

An intermediate course in the active use of spoken and written Russian, dealing with more advanced conversational skills, the translation of more difficult literary texts and free composition.

Prerequisite: RUS 154 or equivalent.

Mrs. N. Thompson and staff

*Fall and Spring, 3 credits each semester*

**RUS 231 Methodology**

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 151 or equivalent.

Mr. A. Hippisley

*Spring, 3 credits*

**RUS 281, 282 Special Century Studies**

Readings in Russian literature from any one of the following periods: 11th-17th centuries; 1700-1819, 1820-1892, 1893-1967. Taught in tutorials.

Prerequisite: RUS 151 or equivalent.

Mrs. L. Vogel, Mr. P. Radley, Mr. A. Hippisley

*Fall and Spring, 3 credits each semester*

**RUS 321, 322 Conversation and Composition IV**

An advanced course in the active use of spoken and written Russian, dealing with more advanced conversational skills and further training in free composition.

Prerequisite: RUS 222.

Staff

*Fall and Spring, 3 credits each semester*



### **RUS 331 Special Period and Genre Studies**

Readings in Russian literature of any one of the following periods or genres, provided it does not fall within the period chosen for RUS 281, 282: the medieval epic, the baroque, neo-classicism, romanticism, the natural school, the realist novel, the satirical tradition, drama, poetry, literary criticism, the age of symbolism, prose of the 1920's, dissident literature, emigré literature, contemporary soviet prose, poetry and drama. Taught in tutorials.

Prerequisite: Senior status as Russian major or permission of instructor.

Mr. A. Hippisley, Mr. P. Radley, Mrs. L. Vogel

### **RUS 333 Special Author I**

The purpose of this course is to study the works of the author chosen and also relevant scholarly criticism. Students may choose one of the following, but must not duplicate the choice made for RUS 334: Pushkin, Gogol, Dostoevsky, Tolstoy. Taught in tutorials.

Prerequisite: Senior status as Russian major or permission of instructor.

Mr. R. Karst, Mr. A. Hippisley, Mr. P. Radley, Mrs. L. Vogel

*Fall, 3 credits*

### **RUS 334 Special Author II**

The purpose of this course is to study the works of the author chosen and also relevant scholarly criticism. Students may choose one of the following, but must not duplicate the choice made for RUS 333: Pushkin, Gogol, Dostoevsky, Tolstoy, Avvakum, Lermontov, Turgenev, Gocharov, Leskov, Chekhov, Blok, Mandel'shtam, Pasternak, Nabokov. Taught in tutorials.

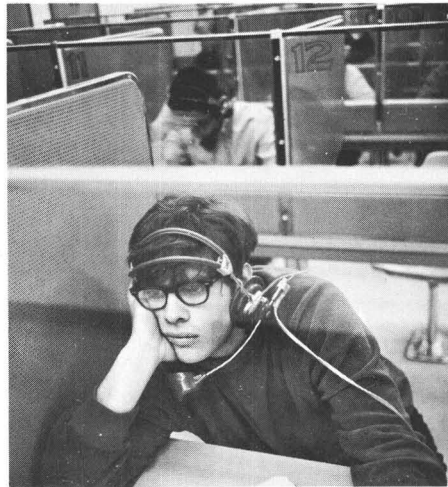
Prerequisite: Senior status as Russian major or permission of instructor.

Mr. A. Hippisley, Mr. R. Karst, Mrs. L. Vogel, Mr. P. Radley

*Spring, 3 credits*

### **RUS 341 Research Methods**

An introduction to the techniques used in the scholarly criticism of literature. Students in this course will be trained to familiarize



themselves with and use the apparatus of literary scholarship. Taught in seminars.

Prerequisite: Senior status as Russian major or permission of instructor.

Mr. A. Hippisley, Mr. P. Radley

*Fall, 3 credits*

### **RUS 342 History of the Russian Language**

The development of the Russian literary language from its beginnings to the present day. The influence of Church Slavonic on the development of the language will be discussed. Prerequisites: RUS 151 and permission of instructor.

Mr. A. Hippisley

*Spring, 3 credits*

### **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*

and philosophers with interpretations directed primarily at the interests of the historian.

Mr. P. Alin

*Fall, 3 credits*

### **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.

Mr. J. Rosenthal

*Fall, 3 credits*

### **HIS 134 Medieval Historical Society**

A survey of medieval historical writing with special attention to the "world view" and sense of chronological perspective revealed by medieval historians; the relationship between a culture's own achievements and its view of the past, whether that be "objective" or mythopoetic.

Mr. J. Rosenthal

*Spring, 3 credits*

### **HIS 135 Science in History**

An examination of the relation between scientific developments and history. In particular the course will examine theories of technological determination, as well as changes in intellectual life which have been brought about by developments of science.

Mrs. R. Cowan

*Fall, 3 credits*

### **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, Ferdinand Tonnies, Charles Booth, Talcott Parsons, and Karl Polanyi.

Mr. H. Lebovics

*Fall, 3 credits*

### **HIS 139 Modern Imperialism**

An investigation of the empire-building of the last three centuries, its nature and mo-

tives, the controversy concerning theories of "imperialism."

Mr. B. Semmel

*Fall, 3 credits*

### **HIS 151 American History to 1877**

The United States from the Age of Discovery to the end of the Reconstruction period, with discussions of such subjects as 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.

Staff

*Fall, 3 credits*

### **HIS 152 United States Since 1877**

The history of the United States from the end of Reconstruction to the present day with discussion of the growth of industrialism and its impact upon economic, social, cultural and political life; the emergence of America as a world power; and American responses to the continuing crisis of contemporary civilization.

Staff

*Spring, 3 credits*

### **HIS 155 England from 1066 to 1688**

The first half of a survey course in English history. 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.

Mr. K. Bottigheimer

*Fall, 3 credits*

### **HIS 156 England Since 1688**

A survey of 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 twentieth century realities.

Mr. K. Bottigheimer

*Spring, 3 credits*

**HIS 157 Far Eastern Civilization**

Chronologically, the course surveys the origin and development of Far Eastern civilization from its beginning to the mid-nineteenth century. Its emphasis will be on the intellectual, artistic and institutional foundations of the traditional societies of China, Japan and Korea.

Mr. R. Lee

*Fall, 3 credits*

**HIS 158 The Far East in Transition**

A survey of modern Far Eastern history, 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.

Mr. R. Lee

*Spring, 3 credits*

**HIS 159 History of Biology**

The course will examine ancient Greek ideas about the nature of life and the modification of those ideas in succeeding centuries: the development of taxonomy, embryology and cytology will be discussed, as well as 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.

Mrs. R. Cowan

*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.

Mr. A. Baskin, Mr. E. Seifman

*Fall, 3 credits*

**HIS 162 History of Western Education**

An analysis of various approaches to the study of the history of western education through an examination of selected histories of education. Emphasis will be placed on developing an understanding of the materials 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. The semester will be devoted to the analysis of works dealing with the history of education during the ancient, medieval and early modern eras. Histories of education selected for study will be chosen from among the writings of such authors as Henri I. Marrou, E. B. Castle, William K. Medlin, Charles H. Haskins, Robert Ulrich and others. This course is identical with EDU 162.

Mr. A. Baskin

*Spring, 3 credits*

**HIS 200 The Ancient Near East and Early Greece**

The development of early civilizations in the eastern Mediterranean area, including those of Egypt, Mesopotamia, Anatolia and the Aegean 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.

Mr. P. Alin

*Fall, 3 credits*

**HIS 201 History of Classical Greece and the Hellenistic World**

A survey of the history of the Greeks and Greek civilization from the Archaic Age, through its classical period in the fifth and fourth centuries B.C. and the era of Alexander the Great and his successors, to the Roman conquest.

Prerequisite: HIS 200 or some background in early Greek history.

Mr. P. Alin

*Spring, 3 credits*

**HIS 202 Roman History to Constantine**

The development of the Roman Republic and Empire, with an emphasis upon the institutions which bound the Roman Mediterranean together and upon the Greco-Roman civilization of the Empire.

Mr. P. Alin

*Spring, 3 credits*

**HIS 205 Humanism and Renaissance**

An examination of the political and ecclesiastical crisis of the later Middle Ages; two centuries of humanistic growth; the influence of the humanists on Western values and attitudes; the Renaissance as a cultural manifestation and as a historical concept.

Mr. R. Weltsch

*Fall, 3 credits*

**HIS 206 The Age of Reformation**

A survey of the political, social and religious changes in Europe during the fourteenth and fifteenth centuries, followed by an examination of the sixteenth century reformations and their relationship to the emerging state system; the religious wars up to 1648.

Mr. K. Bottigheimer

*Spring, 3 credits*

**HIS 207 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.

Mr. W. Angress

*Fall, 3 credits*

**HIS 208 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.

Mr. W. Angress

*Spring, 3 credits*

**HIS 209 Medieval Europe, 300-1400**

A survey of medieval Europe, with emphasis upon the basic institutions of medieval

society: the Church, feudalism, kingship and monarchy. This course replaces HIS 203, 204.

Mr. J. Rosenthal

*Fall, 3 credits*

**HIS 211 Founding of Colonial America**

The discovery and exploration of the New World, English overseas expansion and settlement in North America, problems of trade and imperial control (1660-1714) and the evolution of American provincial society.

Mr. W. Kavenagh

*Fall, 3 credits*

**HIS 212 American Colonial Society**

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

Mr. J. Main

*Spring, 3 credits*

**HIS 213 Age of the American Revolution**

The course surveys the old British Empire at the close of the French Wars. Imperial reorganization and colonial resistance, the War of Independence, and the trials of the new nation and the framing of the Constitution are examined.

Mr. J. Main

*Fall, 3 credits*

**HIS 214 The Early National Era**

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

Mr. J. Main

*Spring, 3 credits*

**HIS 215 The Age of Jackson**

A study of 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.

Mr. P. Staudenraus

*Fall, 3 credits*

**HIS 216 Civil War and Reconstruction**

The course deals with the crisis of sectionalism, the rise of Southern nationalism and of the Republican Party, secession, the Civil

War, abolition and the Reconstruction period.

Mr. P. Staudenraus

*Spring, 3 credits*

### **HIS 217 Recent U.S. History, 1877-1929**

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. Emphasis will be placed on the relation of the United States to the world economy and on the roots of the Great Depression.

Mr. D. Burner

*Fall, 3 credits*

### **HIS 218 Recent U.S. History, 1929-1962**

The Great Depression and the impact of Keynesian thought, the New Deal, the rise of industrial unionism, World War II and its aftermath, the Cold War and technological and social change are among the subjects discussed.

Mr. H. Cleland

*Spring, 3 credits*

### **HIS 219 U.S. Urban History**

Introduction to historical studies of urbanization in the United States, with special reference to demographic, economic and organizational features of urban and rural populations. Some attention will be given to the physical building of cities and to contemporary understandings of urban "problems."

Prerequisites: HIS 151, 152 or permission of instructor.

Mr. E. Lampard

*Fall, 3 credits*

### **HIS 220 History of Canada**

A survey of the conflicting interpretations of the major issues in Canadian history: How does Canada survive as a separate state in North America? How do the French Canadians survive as a separate cultural and linguistic group in Canada? Is Canadian society basically distinct from that of the United States?

Prerequisites: HIS 151, 152 or permission of instructor.

Mr. J. Williams

*Spring, 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.

Mr. E. Chinchilla-Aguilar

*Fall, 3 credits*

### **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 nineteenth and twentieth centuries.

Mr. B. Hamnett

*Spring, 3 credits*

### **HIS 223 Latin America and the Outside World**

An analysis of the role of the Latin American nations in world affairs during the nineteenth and twentieth centuries is undertaken with emphasis on intellectual, economic and diplomatic relations with the United States and Europe.

Mr. R. Levine

*Fall, 3 credits*

### **HIS 224 Modern Mexico**

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

Staff

*Spring, 3 credits*

### **HIS 225 Social and Economic History of Colonial Spanish America**

The emergence of new 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. Prerequisite: HIS 121 (or HIS 153, which it replaces) or permission of instructor.

Mr. B. Hamnett

*Spring, 3 credits*

**HIS 227 Colonial and Neo-Colonial Brazil**

Aspects of Brazilian history, 1500-1889. The course will treat such themes as the transition of Portuguese political and cultural institutions to Brazil, the emergence of the Brazilian nation and the period of the Empire through 1889.

Prerequisites: HIS 121, 122 (or HIS 153, 154, which they replace) or permission of instructor.

Mr. R. Levine

*Fall, 3 credits*

**HIS 228 Modern Brazil**

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

Prerequisite: HIS 122 (or HIS 154, which it replaces) or permission of instructor.

Mr. R. Levine

*Spring, 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 Peron regime.

Staff

*Fall, 3 credits*

**HIS 233 Early Modern England: Change and Reformation, 1509-1603**

An examination of the development of English society from the reign of Henry VIII to the death of Elizabeth. Attention will be focused upon the decline of medieval institutions, the course of the Reformation and its impact upon the political, economic and intellectual life of the society.

Mr. K. Bottigheimer

*Fall, 3 credits*

**HIS 234 Early Modern England: Revolution and War, 1603-1714**

An inquiry into the source, nature and outcome of the English Revolution, conceived

as a single, systematic disorder causing intermittent crises throughout the seventeenth century. Particular 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.

Mr. K. Bottigheimer

*Spring, 3 credits*

**HIS 236 England, 1782-1867: Industrialism, Reform and the Advent of Democracy**

An examination of English political, social, economic and intellectual development from the time of the younger Pitt and the early years of industrialism to the coming of democracy and the emergence of the *Pax Britannica*; the wars of the French Revolution; the struggles for political and economic reform; romanticism and philosophical radicalism; free trade and the Workshop of the World.

Mr. B. Semmel

*Fall, 3 credits*

**HIS 237 Modern Britain, 1867 to the Present: England in the Age of Democracy**

An analysis of English society from the era of Gladstone and Disraeli to that of Wilson and Heath; the continuance of reform; the rise of socialism and the Labour party; imperialism; the world wars against Germany; the welfare state; the decline of Britain's international, economic, and political position.

Mr. B. Semmel

*Spring, 3 credits*

**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 151, 152 or HIS 156 or permission of instructor.

Mr. J. Williams

*Spring, 3 credits*

**HIS 239 Materials and Methods in Teaching Social Studies**

This course emphasizes the methods and materials appropriate to the teaching of a

broad range of subject matter in the social sciences at the high school level. It is designed for prospective secondary school teachers of social studies.

Prerequisite: Permission of the chairman of the student's major department.

Mr. E. Seifman

*Fall and Spring, 3 credits*

### **HIS 241 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 problems of its relations with the West.

Mr. A. Wildman

*Fall, 3 credits*

### **HIS 242 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 are the subjects of analysis.

Mr. A. Wildman

*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 and successor states up to the Second World War.

Mr. R. Weltsch

*Spring, 3 credits*

### **HIS 251, 252 History of Science**

During the first semester, the course will deal with the Greek scientific tradition and with the manner in which that tradition later was transformed during the scientific revolution of the sixteenth and seventeenth centuries. The second semester will be devoted to scientific developments of the eighteenth and nineteenth centuries. Some attention will also be given to the growth of science as a social institution.

Prerequisites: For 251, two semester courses

in natural science or equivalent or permission of instructor; for 252, HIS 251 or permission of instructor.

Mrs. R. Cowan

*Fall and Spring, 3 credits each semester*

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

A history of social and political thought in post-Reformation Europe, the Age of Enlightenment, with particular reference to such developments as the beginnings of modern science, empiricism, rationalism, the philosophical origins of the French Revolution, romanticism, nationalism, industrialization and Marxism.

Mr. H. Lebovics

*Fall, 3 credits*

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

A history of 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.

Mr. H. Lebovics

*Spring, 3 credits*

### **HIS 255 Expansion of Europe, 1500-1800**

An analysis of the interrelationship between European cultures and other cultures of the world in the period from the Age of Discovery to the end of the eighteenth century. Pre-industrial forms of European overseas activity will be examined with emphasis on the revolution in transportation, trading post empires and plantation systems.

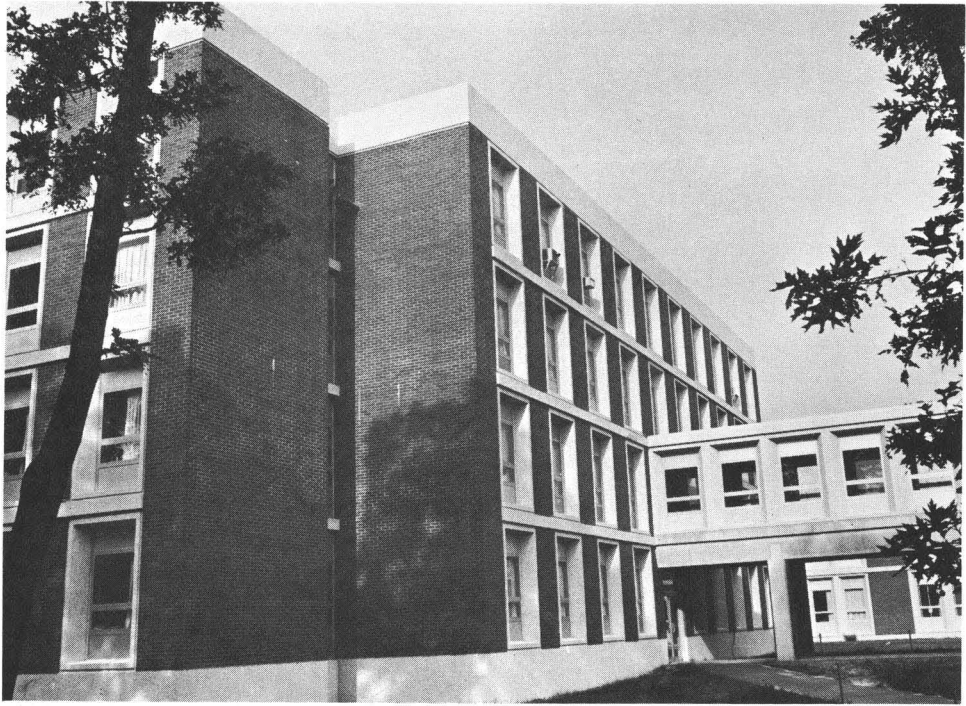
Mr. F. Knight

*Fall, 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 twentieth century liquidation of Europe's overseas empires will be studied.





Prerequisite: HIS 255 or permission of instructor.

Mr. F. Knight

*Spring, 3 credits*

### **HIS 259 History of the British Empire**

The course of British imperial control over tropical dependencies in Africa, Asia and the Pacific since the late eighteenth century. Among the questions studied comparatively will be: imperial advance, the means and ends of colonial policy, problems of plural societies, resistance to imperial rule and the transfer of power.

Prerequisite: HIS 156 or permission of instructor.

Mr. J. Williams

*Fall, 3 credits*

### **HIS 261 Intellectual History of China**

A study of the major schools of Chinese thought from the classical era of Chinese

philosophy through the nineteenth century to the modern age of Mao Tse-tung and their influence upon the historical development of Chinese society.

Prerequisite: HIS 157 recommended.

Mr. R. Lee

*Fall, 3 credits*

### **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 twentieth century China.

Mr. R. Lee

*Spring, 3 credits*

### **HIS 263 A History of Southeast Asia to 1500**

A survey of the historical development of the countries of Southeast Asia to the fifteenth century with reference to their political,

artistic and religious components. The impact of Indian and Chinese cultures on the region will be viewed against the background of the indigenous inheritance.

Mr. T. Lam  
*Fall, 3 credits*

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

A study of the impact of Western imperialism on Southeast Asia. Special emphasis will be given to colonial policies and the various responses of Southeast Asian peoples to these policies.

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

Mr. T. Lam  
*Spring, 3 credits*

**HIS 271 American Constitutional Origins**

A study in the law, institutions and customs of the American constitutional system. 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.

Mr. J. Pratt  
*Fall, 3 credits*

**HIS 272 American Constitutional  
Development**

The development of the federal constitutional system with emphasis on the national sovereignty—states rights controversy to 1876, the effects of industrial change, the enlargement of the Presidency, and the impact of crisis government on the American Constitution in the twentieth century.

Mr. J. Pratt  
*Spring, 3 credits*

**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.

Mr. R. Marcus  
*Fall, 3 credits*

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

A study of the development of American institutions and thought in the years since the Civil War.

Mr. R. Marcus  
*Spring, 3 credits*

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

The evaluation of 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 and imperialistic consequences.

Mr. D. Trask  
*Fall, 3 credits*

**HIS 276 History of U.S. Foreign  
Relations, 1900 to the Present**

The evaluation of 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; post World War II development, especially the Russo-American confrontation and social revolution in the non-western world.

Mr. D. Trask  
*Spring, 3 credits*

**HIS 277 History of American Labor to  
1900**

The course considers the development of the labor force and the labor movement in its broader setting. It considers labor in colonial times, 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 on the labor movement.

Mr. H. Cleland  
*Fall, 3 credits*

**HIS 278 History of American Labor  
Since 1900**

The course deals with the rivalry between the AFL and the Industrial Workers of the World; the effects of mass production and

scientific management; labor and the ethnic groups; the changing role of the national government; the CIO challenge to the AFL; and the effects of automation.

Mr. H. Cleland

*Spring, 3 credits*

### **HIS 279 Afro-American History**

A survey of the life and history of the Afro-American in North America from African beginnings and the slave trade to the present.

Mr. W. Turner

*Spring, 3 credits*

### **HIS 281 Modern France, 1750-1815: Old Regime, Revolution and Napoleon**

Within a framework of political history, emphasis will be placed upon the origins and dynamics of the French Revolution and the effect upon society and thought.

Staff

*Fall, 3 credits*

### **HIS 282 Modern France, 1815-Present**

The French nation's search for definition in the nineteenth and twentieth centuries with much attention given to the social and economic background of political change.

Staff

*Spring, 3 credits*

### **HIS 283 Bourbon France, 1598-1789**

The consolidation and disintegration of the Old Regime in France under Bourbon absolutism from the end of the religious wars to the coming of the Revolution. The interaction between the royal government and social pressures will be emphasized.

Mr. K. Demuth

*Fall, 3 credits*

### **HIS 284 History of Spain**

The formation and shaping of Spain from the Middle Ages to the modern period with special emphasis on the imperial phase between 1492 and 1825 and the appearance of modern political parties in the nineteenth century and after. Domestic political, eco-

nomical and intellectual developments, rather than the Empire or foreign affairs, will provide the central focus of the course.

Staff

*Spring, 3 credits*

### **HIS 285 Germany, 1806-1890**

The course will examine the development of Germany from the Napoleonic period, through unification and the founding of the Empire, to Bismarck's dismissal. Although the emphasis will be on political and social aspects of this period, economic and cultural trends will be included in the investigation.

Mr. W. Angress

*Fall, 3 credits*

### **HIS 286 Germany, 1890 to the Present**

The course will examine the development of 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. Although the emphasis will be on political and social aspects of this period, economic and cultural trends will be included in the investigation.

Mr. W. Angress

*Spring, 3 credits*

### **HIS 291 History of Africa South of the Sahara**

The states and empires of independent 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, 1945 on.

Mr. J. Williams

*Fall, 3 credits*

### **HIS 294 History of New York State**

A survey of the development of New York from the colonial period to the present, with special emphasis on the role it played in the development of the United States and the interaction of national affairs on the state.

Mr. W. Kavenagh

*Spring, 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 Neareastern history.

Mr. P. Alin

*Spring, 3 credits*

**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.

Staff

*Fall, 3 credits*

**HIS 309 Problems in Medieval History**

Selected topics in medieval history will be studied with attention to primary sources, the relationship between social and intellectual history and current historiographic controversies and developments.

Prerequisite: Permission of instructor.

Mr. J. Rosenthal

*Spring, 3 credits*

**HIS 311 Topics in Colonial American History**

Selected topics in the development of colonial society, the influence of the New World on English traditions, the problems of internal growth and expansion, the influence of British colonial policy to 1715. Use of primary source materials is stressed.

Mr. W. Kavenagh

*Fall, 3 credits*

**HIS 315 Topics in Jacksonian America, 1815-1830**

The course will analyze through discussions and independent research 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.

Mr. P. Staudenraus

*Spring, 3 credits*

**HIS 325 Cultural History of Latin America I**

Precolonial period literature, its permanent influence on Latin American thinking. Early history and description of the New World. Discussion about the nature of the New World and the Indians; schools and universities; the Baroque times; the Enlightenment; modern ideas during the eighteenth century.

Mr. E. Chinchilla-Aguilar

*Fall, 3 credits*

**HIS 326 Cultural History of Latin America II**

The cultural history of Latin America during the national period, including such topics as the ideals of independence and the search for national goals, French and American influences, liberalism and the early romantic period, church and state, and modernism and the contemporary search for identity.

Mr. E. Chinchilla-Aguilar

*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 twentieth century.

Prerequisites: This course assumes a fair knowledge of European history and European thought in the modern period.

Mr. H. Lebovics

*Fall, 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. Topics of concentration will be the revolution in transportation; the ac-

quisition of new knowledge and its diffusion; trading post empires and plantation systems of the Europeans.

Mr. F. Knight

*Fall, 3 credits*

### **HIS 363 Problems in the Modern History of Vietnam and Indonesia**

An examination in some detail of the modern period of Vietnamese and Indonesian history. Colonial administration and policies and the task of nation-building after independence will be studied in depth.

Prerequisite: The course assumes some background in Southeast Asian history.

Mr. T. Lam

*Fall, 3 credits*

### **HIS 364 Problems in the Modern History of Malaya and Burma**

A comparison in some detail of British colonial policy in Malaya and Burma. The problem of ethnic minorities and the interaction of religion and politics will be examined. Prerequisite: The course assumes some background in Southeast Asian history.

Mr. T. Lam

*Spring, 3 credits*

### **HIS 391, 392 Senior Honors Project in History**

A two-semester project for qualified senior majors which will enable them to fulfill the requirements for bachelor's degree with honors. Arranged in consultation with the department, the project involves independent study and the writing of an honors paper under the close supervision of an appropriate instructor on a suitable topic selected by the student.

Prerequisite: A 3.0 average in social science courses or permission of the department.

Staff

*Fall and Spring, 3 credits each semester*

### **HIS 399 Readings in History**

Qualified juniors and seniors in history will be afforded the opportunity to read selectively under the guidance 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: Major in history, junior or senior standing and permission of the department.

Staff

*Fall and Spring, 1 to 3 credits*

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### **Colloquia in History**

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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.

Staff

HIS 411 Colloquium in American History

*Fall, 3 credits*

HIS 412 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 431 Colloquium in European History

*Fall, 3 credits*

HIS 432 Colloquium in European History

*Spring, 3 credits*

HIS 461 Colloquium in Asian History

*Fall, 3 credits*

HIS 462 Colloquium in Asian History

*Spring, 3 credits*

## INTERDISCIPLINARY PROGRAM IN LINGUISTICS

In addition to the general university requirements for the bachelor of arts degree, the following courses are required for the major in linguistics:

1. LIN 102 (*Methods of Linguistic Description*) and LIN 103 (*Introduction to Syntax*)
2. One year of a non-Indo-European language.
3. PHI 162 (*Symbolic Logic*)
4. Seven additional courses to be selected after consultation with the student's advisor.
5. Two years of a modern foreign language.

Recommended undergraduate courses in other departments:

GRK 111, 112 (*Elementary Greek*)  
 PHI 311 (*Contemporary Philosophies of Language*)  
 SOC 391 (*Sociology of Language*)  
 ESA 165 or ESG 162 (*Introduction to Digital Computers*)  
 ESA 335 (*Computer Organization and Programming*)  
 ESA 340 (*Introduction to the Theory and Applications of Computers*)

For further information about the linguistics program, consult Professor Frank Anshen in the English Department.

### Courses in Linguistics

#### LIN 102 Methods of Linguistic Description

An introduction to phonology and morphology.

*Spring, 3 credits*

#### LIN 103 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 105 Non-Standard 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 the white migrant workers. This course is identical with EGL 282.

Staff

*Fall and Spring, 3 credits*

#### LIN 201 Phonology

An introduction to the mechanics of speech production, acoustic phonetics and phonological theories. This course is identical with EGL 284.

Prerequisite: LIN 102.

Staff

*Fall and Spring, 3 credits*

#### LIN 202 Morphological Analysis

The principles of generative phonology, applied morphophonemics and morphology.

This course is identical with EGL 287.  
Prerequisite: LIN 102.  
Staff

*Fall and Spring, 3 credits*

### **LIN 210 Introduction to Socio-Linguistics**

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, 103.

*Fall and 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.

Prerequisite: LIN 103.

*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 260 Methods and Materials in the Teaching of Foreign Languages**

This course is identical with FLA 239.

Prerequisite: LIN 102.

*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 measuring. This course is identical with ANT 263.

Prerequisite: ANT 150 or permission of instructor.

*Fall and Spring, 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 203.

*Fall and Spring, 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 103.

*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 380 Seminar in Historical Linguistics**

Examination of selected problems in the historical development of languages of interest to the members of the seminar.

Prerequisite: LIN 250.

*Fall and Spring, 3 credits*



## DEPARTMENT OF MATHEMATICS

*Professors:* ALFRED ADLER, JAMES AX, WILLIAM D. BARCUS, RAOUF DOSS, RONALD G. DOUGLAS, DETLEF GROMOLL, WILLIAM G. LISTER, JOEL D. PINCUS, ELVIRA S. RAPAPORT, JAMES SIMONS (*Chairman*), PETER SZÜSZ

*Visiting Lecturer:* WOLFGANG MEYER

*Associate Professors:* LEONARD CHARLAP, JEFF CHEEGER, DAVID EBIN, HERSHEL FARKAS, WILLIAM FOX, IRWIN KRA (*Director of Undergraduate Studies*), STEVEN SCHANUEL, JOHN A. THORPE, EUGENE ZAUSTINSKY

*Assistant Professors:* GREGORY BACHELIS, HUGO D'ALARCAO, LAWRENCE FEINER, MICHAEL FRIED, JOHN W. HELTON, ROGER HOWE, PAUL KUMPEL, YOON YONG OH, ANTHONY PHILLIPS, JOSEPH ROITBERG, JOHN ROSENTHAL, DAVID SCHROER, R. SHANTARAM, HENRY TRAMER

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.

### 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:

*Either* MAT 102, 103, 155, 156, 201, 232 plus 18 additional credit hours in mathematics courses numbered above 200,

*Or* MAT 193, 194, 195, 196, 232 plus 15 additional credit hours in mathematics courses numbered above 200.

Students preparing for a *Ph.D. program* in pure mathematics are encouraged to include in their programs:

MAT 202, 312, 323, 331, 301 or 522.

Students preparing for a career in *high school teaching* are encouraged to include in their programs:

MAT 205, 239, 204 or 301, 321, 332.

Students preparing for a career in *applied mathematics* are encouraged to include in their programs:

MAT 203, 204 or 301, 205, 206, 303, 304.

The department encourages students majoring in mathematics to begin advanced work in the sophomore year, by enrolling for MAT 232 in the second semester of that year, for example. Students planning graduate study in mathematics are advised to elect either French, German or Russian since many graduate schools require two of these three languages. Furthermore, prospective graduate students are encouraged to take graduate courses in mathematics during their junior and senior years.

For entering students with above average interest and ability in mathematics, the department directs attention to its honors calculus sequence MAT 193, 194, 195, 196. In particular, students entering with advanced placement in mathematics are encouraged to consider this sequence.

All mathematics majors are urged to take at least one year of physics.

## COURSES IN MATHEMATICS

### MAT 101 Elementary Functions

Functions, graphing, algebraic operations on functions; analysis of rational trigonometric and exponential functions. 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 102, 103, 155, 156.

Prerequisite: May be taken only by students who have had at *most* three years of secondary school mathematics except by permission of instructor.

Mr. S. Schanuel

*Fall and Spring, 3 credits*

### MAT 102 Calculus I

The derivative and integral: fundamental properties, interpretations and computations for elementary functions.

Staff

*Fall and Spring, 3 credits*

### MAT 103 Calculus II

Integration techniques. Selected applications of the derivative and integral. First order differential equations, Taylor's formula. Infinite series.

Prerequisite: MAT 102 or MAT 193.

Staff

*Fall and Spring, 3 credits*

### MAT 105 Elements of Probability

Random events and finite probability, discrete probability models, counting procedures. Some basic discrete probability distributions and their uses, including prediction and hypothesis testing.

Mr. D. Schroer

*Fall, 3 credits*

### MAT 107 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. MAT 107 and MAT 108 are intended primarily for those who do not plan to take more advanced courses in mathematics and may be taken in any order.

Mr. J. Ax

*Fall, 3 credits*

### MAT 108 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. MAT 107 and MAT 108 may be taken in any order.

Staff

*Spring, 3 credits*

**MAT 155 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: MAT 103.

Staff

*Fall and Spring, 3 credits*

**MAT 156 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: MAT 155.

Staff

*Fall and Spring, 3 credits*

**MAT 193, 194, 195, 196 Honors  
Calculus I-IV**

This four-term sequence of four-credit courses is designed for students with above-average interest and ability in mathematics. The material covered will be substantially that of MAT 102, 103, 155, 156, 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 MAT 193, which satisfies the prerequisites for MAT 103. Mr. I. Kra, Mr. J. Thorpe

*Fall (Mat 193, 195) and Spring (Mat 194, 196), 4 credits each semester*

**MAT 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: MAT 155.

Mr. R. Douglas

*Fall and Spring, 3 credits*

**MAT 202 Analysis II**

Calculus of several variables: inverse and implicit function theorems, differential forms, submanifolds of  $n$ -space, Stokes' theorem.

Prerequisites: MAT 156 and MAT 201.

Mr. R. Douglas

*Fall and Spring, 3 credits*

**MAT 203 Differential Equations**

Review of linear ordinary differential equations and linear systems. Series solutions. Eigenvalue problems. Bessel and Legendre functions. Expansions in series of orthogonal functions including Fourier series. Introduction to partial differential equations.

Prerequisite: MAT 156 or MAT 194.

Staff

*Fall and Spring, 3 credits*

**MAT 204 Introduction to Complex  
Function Theory**

Functions of a complex variable including a description of the elementary functions. Holomorphic functions. Cauchy-Riemann equations. Power series expansions. Contour integrations; the Cauchy theory. Residues and poles. Conformal mappings. Laplace and Fourier transforms. This course differs from MAT 301 in that it is more applications-oriented; it may not be taken for credit in addition to MAT 301.

Prerequisite: MAT 156 or MAT 194.

Mr. Y. Oh, Mr. A. Phillips

*Fall and Spring, 3 credits*

**MAT 205, 206 Probability and Statistics**

Finite, discrete and continuous probability distributions, random variables, conditional probability, multivariate distributions, Markov chains, laws of large numbers, central limit theorem. Statistical applications: random sampling, estimation, significance testing, hypothesis testing, regression correlation. Further topics.

Prerequisite: MAT 103 or MAT 194.

Mr. W. Fox, Mr. R. Shantaram

*Fall and Spring, 3 credits each semester*

**MAT 232 Algebra I**

Basic concepts in abstract algebra: groups and rings together with their homomor-

phisms and quotient structures. Integral domains, unique factorization domains and principal ideal domains. Fields and polynomial domains over fields.

Prerequisite: MAT 155 or MAT 194.

Staff

*Fall and Spring, 3 credits*

### **MAT 233 Number Theory**

Congruences, quadratic residues, quadratic forms, continued fractions, Diophantine equations, number-theoretical functions and properties of the prime numbers.

Prerequisite: MAT 155 or MAT 194.

Mr. P. Szűsz

*Fall, 3 credits*

### **MAT 234 Linear Algebra**

Vector spaces over fields, linear transformations, the orthogonal and unitary groups, canonical forms for matrices, the spectral theorem, multilinear algebra.

Prerequisite: MAT 155 or MAT 194.

Staff

*Spring, 3 credits*

### **MAT 239 Methods and Materials in Teaching Mathematics**

An examination of topics in high school mathematics, principally algebra and geometry, in terms of the implications of their conceptual organization in the university curriculum for secondary school instruction. Specific pedagogical techniques, general instructional styles and available curricular resources are applied to particular mathematical contexts.

Staff

*Spring, 3 credits*

### **MAT 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: MAT 201 or MAT 195. This course may not be taken for credit in addition to MAT 204.

Staff

*Spring, 3 credits*

### **MAT 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: MAT 202 or MAT 196.

Staff

*Spring, 3 credits*

### **MAT 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 non-linear systems with slowly varying parameters, forced oscillations, subharmonic oscillations and entrainment, bifurcation of solutions, Hamiltonian systems, small denominators.

Prerequisites: MAT 203 and either 204 or 301.

Mr. J. Pincus

*Fall and Spring, 3 credits each semester*

### **MAT 312 Introduction to Topology**

Introduction to point set topology: connectedness, compactness, continuity, etc. The fundamental group and covering spaces.

Prerequisites: Either MAT 202 or 196, and 232.

Mr. P. Kumpel

*Fall and Spring, 3 credits*

### **MAT 321 Geometric Structures**

Formal geometries, their relationship and interpretations; projective, affine, Euclidean and non-Euclidean geometries.

Prerequisite: MAT 232.

Staff

*Spring, 3 credits*

**MAT 323 Introduction to Differential Geometry**

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

Prerequisite: MAT 312 or permission of instructor.

Mr. W. Meyer

*Fall and Spring, 3 credits*

**MAT 331 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: MAT 232.

Mr. W. Lister

*Fall and Spring, 3 credits*

**MAT 332 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: MAT 232.

Mr. H. Tramer

*Fall and Spring, 3 credits*

**MAT 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 undergraduate studies, who will arrange for a faculty member to supervise the project.

*Fall and Spring, 3 credits*

**MAT 351 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: MAT 232.

Mr. D. Schroer

*Fall, 3 credits*

**MAT 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 instructor.

Mr. J. Cheeger

*Fall and Spring, 3 credits*

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**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.

MAT 502, 503 Algebra

MAT 504 Homological Algebra

MAT 505 Group Theory

MAT 506, 507 Theory of Numbers

MAT 508, 509 Algebraic Geometry

MAT 512, 513 Real Analysis

MAT 514, 515 Functional Analysis

MAT 516, 517 Partial Differential Equations

MAT 518, 519 Harmonic Analysis

MAT 522, 523 Complex Analysis

MAT 524, 525 Riemann Surfaces and Automorphic Functions

MAT 532, 533 Algebraic Topology

MAT 534 Differential Topology

MAT 542, 543 Differential Geometry

MAT 544, 545 Riemannian Geometry

MAT 546, 547 Lie Groups and Lie Algebras

MAT 552, 553 Logic

MAT 602, 603 Topics in Algebra

MAT 612, 613 Topics in Analysis

MAT 622, 623 Topics in Complex Analysis

MAT 632, 633 Topics in Topology

MAT 642, 643 Topics in Geometry

MAT 652, 653 Topics in Logic

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## DEPARTMENT OF MUSIC

*Professors:* BILLY JIM LAYTON (*Chairman*), ISAAC NEMIROFF

*Associate Professors:* EDWARD A. BONVALOT, \*JOHN LESSARD, DAVID LEWIN

*Assistant Professor:* SARAH A. FULLER

*Instructors:* RICHARD A. KRAMER, DAVID LAWTON

*Director of Choral Music:* GREGG SMITH

*Director of the University Band:* SIMON KARASICK

*Performing Artists in Residence:* ADELE ADDISON, SAMUEL BARON, MARTIN CANIN,  
\*\*RALPH FROELICH, \*\*DAVID GLAZER, BERNARD GREENHOUSE, JACK  
KREISELMAN, \*\*RONALD ROSEMAN, CHARLES ROSEN, \*\*ARTHUR WEIS-  
BERG, PAUL ZUKOFSKY

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. Provisional certification to teach music in the public schools of New York State may be gained by the addition to the music major program of 12 credits in education plus supervised practice 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  
Students who wish to major in music should apply to the department office for interviews and auditions with the faculty.
- B. Study within the area of the major
  1. Theory  
MUS 125, 126, 127, 128 (*Basic Compositional Skills*)  
MUS 201 (*Analysis of Tonal Music*)  
MUS 203 (*Analysis of Twentieth Century Works*)
  2. History and literature  
MUS 141, 142 (*The History of Western Music*)  
Four additional courses, three of which must be 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.

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\*On leave academic year 1969-70.

\*\*Member of The New York Woodwind Quintet.

### 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 two years.

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

### MUS 101 Music in Western Civilization

Examination of the musical heritage of Europe and America in terms of its development from antiquity to the present day. A survey of Medieval and Renaissance forms will introduce a closer study of the period after 1600. Emphasis will fall on major composers and specific works. (Previously listed as HUM 114.)

Staff

*Fall and Spring, 3 credits*

### MUS 103 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, Schumann, Liszt, Wagner and Verdi.

Mr. E. Bonvalot

*Spring, 3 credits*

### MUS 104 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.

Mr. E. Bonvalot

*Fall, 3 credits*

### MUS 105 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.

Mr. C. Rosen, Mr. R. Kramer

*Fall, 3 credits*

### MUS 106 Music of the Twentieth Century

An introduction to the variegated and rapidly changing trends of the present century including impressionism, expressionism, neo-





classicism, 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.

Mr. C. Rosen, Mr. R. Kramer  
*Spring, 3 credits*

#### **MUS 114 University Chorus**

Open to all students. Study and performance of a repertory from the Middle Ages to the present. Meets three hours per week. More than four unexcused absences from rehearsals eliminates credit.

Prerequisite: Auditions.  
Mr. G. Smith

*Fall and Spring, 1 credit each semester, may be repeated any number of times*

#### **MUS 115 University Orchestra**

Open to all students. Study and performance of works from the repertory of the concert orchestra. Meets three hours per week. More than four unexcused absences from rehearsals eliminates credit.

Prerequisite: Auditions.  
Mr. D. Lawton

*Fall and Spring, 1 credit each semester, may be repeated any number of times*

#### **MUS 116 University Band**

Open to all students. Study and performance of works from the repertory of the concert band. Meets three hours per week. More than four unexcused absences eliminates credit. Prerequisite: Auditions.

Mr. S. Karasick

*Fall and Spring, 1 credit each semester, may be repeated any number of times*

#### **MUS 119 The Elements of Music**

The notation of intervals, scales, chords, rhythms and meters. Practical exercises and ear training, intended for students majoring in fields other than music.

Mr. D. Lawton

*Fall and Spring, 3 credits*

#### **MUS 121 Foundations of Musicianship**

Melodic, rhythmic and harmonic dictation. Sight singing and rhythmic exercises. Practical beginning theory, intended for music majors who are unprepared to enter MUS 125. Prerequisite: Permission of instructor.

Miss S. Fuller

*Fall and Spring, 3 credits*

#### **MUS 123, 124 The Structural Principles of Music I, II**

Intended for students majoring in fields other than music. 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. Students lacking some prior familiarity with musical notation will be given supplementary exercises. MUS 123 may be taken alone.

Prerequisite: For MUS 123, permission of instructor; for MUS 124, MUS 123.

Mr. I. Nemiroff

*Fall and Spring, 3 credits each semester*

#### **MUS 125, 126 Basic Compositional Skills I, II**

The construction of melodies. Modal counterpoint in two and three voices.

Prerequisite: MUS 121 or the equivalent.

Mr. I. Nemiroff

*Fall and Spring, 3 credits each semester*

**MUS 127, 128 Basic Compositional Skills III, IV**

Tonal harmony. Practice in homophonic writing, including the harmonization of chorales.  
Prerequisites: MUS 125, 126.

Mr. D. Lewin

*Fall and Spring, 3 credits each semester*

**MUS 141, 142 The History of Western Music I, II**

A survey of style and form extending from antiquity to the present day.

Prerequisite: MUS 121 or the equivalent.

Mr. R. Kramer

*Fall and Spring, 3 credits each semester*

**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. Small groups of students meet one hour per week with the instructor, with four hours individual practice required.

Prerequisite: Permission of instructor.

Staff

*Fall and Spring, 1 credit*

**MUS 161 to 199 Secondary Instrument or Voice**

One half-hour 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 each semester, may be repeated any number of times.*

**MUS 161 Piano**

Mr. M. Canin, Mr. C. Rosen

**MUS 167 Violin**

Mr. P. Zukofsky

**MUS 168 Viola****MUS 169 Cello**

Mr. B. Greenhouse

**MUS 170 String Bass****MUS 174 Flute**

Mr. S. Baron

**MUS 175 Oboe**

Mr. R. Roseman

**MUS 176 Clarinet**

Mr. D. Glazer, Mr. J. Kreiselman

**MUS 177 Bassoon**

Mr. A. Weisberg

**MUS 183 Horn**

Mr. R. Froelich

**MUS 184 Trumpet****MUS 185 Trombone**

Mr. S. Karasick

**MUS 186 Tuba**

Mr. S. Karasick

**MUS 191 Percussion****MUS 199 Voice**

Miss A. Addison

**MUS 201 Analysis of Tonal Music**

This 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.

Prerequisites: MUS 127, 128.

Mr. D. Lawton

*Fall, 3 credits*

**MUS 203 Analysis of Twentieth Century Works**

Music to be studied will be selected from representative works by Debussy, Bartok, Schoenberg, Stravinsky, Webern and others.

Prerequisite: MUS 201.

Mr. D. Lawton

*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 sixteenth century. Prerequisites: MUS 127, 128.

*3 credits. Not offered in 1969-70*

**MUS 211 Modal Counterpoint**

Advanced work in sixteenth century style.

Prerequisites: MUS 127, 128.

*3 credits. Not offered in 1969-70*

**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.

Prerequisites: MUS 127, 128.

Mr. D. Lewin

*Spring, 3 credits*

**MUS 215 Advanced Harmony**

Techniques and practices beyond those studied in MUS 127, 128.

Prerequisites: MUS 127, 128.

Mr. D. Lewin

*Spring, 3 credits*

**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 each semester, may be repeated any number of times*

MUS 261 Piano

Mr. M. Canin, Mr. C. Rosen

MUS 267 Violin

Mr. P. Zukofsky

MUS 268 Viola

MUS 269 Cello

Mr. B. Greenhouse

MUS 270 String Bass

MUS 274 Flute

Mr. S. Baron

MUS 275 Oboe

Mr. R. Roseman

MUS 276 Clarinet

Mr. D. Glazer, Mr. J. Kreiselman

MUS 277 Bassoon

Mr. A. Weisberg

MUS 283 Horn

Mr. R. Froelich

MUS 284 Trumpet

MUS 285 Trombone

Mr. S. Karasick

MUS 286 Tuba

Mr. S. Karasick

MUS 291 Percussion

MUS 299 Voice

Miss A. Addison

**MUS 301 Homophonic Forms**

Composition in Classical and Romantic styles, proceeding from individual phrases to large movements.



Prerequisites: MUS 127, 128.  
Mr. D. Lewin  
*Fall, 3 credits*

### **MUS 303 Fugue**

Application of the skills of tonal counterpoint to fugal composition.  
Prerequisite: MUS 213.  
*3 credits. Not offered in 1969-70*

### **MUS 305 Orchestration**

The possibilities and limitations of the commonly used instruments. Conventions of notation. Practice in scoring for various ensembles.  
Prerequisites: MUS 127, 128.  
*3 credits. Not offered in 1969-70*

### **MUS 313 Composition**

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

### **MUS 317 Conducting**

Basic baton technique and the analysis and preparation of instrumental and vocal scores for performance.  
Prerequisites: MUS 203, 305 and permission of instructor.  
Mr. G. Smith  
*Fall and Spring, 3 credits*

### **MUS 319 Ensemble**

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 twentieth 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 repertoires 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 341 Music of the Middle Ages**

The traditions of Europe from early Christian chant to the polyphonic forms of the late fourteenth century.

Prerequisites: MUS 141, 142.

*3 credits. Not offered in 1969-70*

**MUS 343 Music of the Renaissance**

The vocal and instrumental arts of the fifteenth and sixteenth centuries.

Prerequisites: MUS 141, 142.

*3 credits. Not offered in 1969-70*

**MUS 345 Classical Chamber Music**

The string quartets of Haydn, Mozart and Beethoven provide a central point of reference in the course.

Prerequisites: MUS 141, 142.

*3 credits. Not offered in 1969-70*

**MUS 347 Johann Sebastian Bach**

A study of selected vocal and instrumental works.

Prerequisites: MUS 141, 142.

Mr. R. Kramer

*Spring, 3 credits*

**MUS 349 The Sixteenth Century Madrigal**

The development in Italy of this important form is traced to its eventual influence on England.

Prerequisites: MUS 141, 142.

*3 credits. Not offered in 1969-70*

**MUS 351 Beethoven**

Works of differing scope and medium drawn from every period of his life will be studied.

Prerequisites: MUS 141, 142.

*3 credits. Not offered in 1969-70*

**MUS 353 The Operas of Mozart**

A general consideration of *opera seria*, *opera buffa*, *Singspiel* and other traditions affecting the composer's style accompanies a detailed examination of selected works.

Prerequisites: MUS 141, 142.

Mr. E. Bonvalot

*Spring, 3 credits*

**MUS 355 Verdi**

The operas selected for critical comparison will illustrate the steady growth and refinement of his art over more than 50 years.

Prerequisites: MUS 141, 142.

*3 credits. Not offered in 1969-70*

**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 141, 142.

Mr. R. Kramer

*Fall, 3 credits*

**MUS 359 Wagner**

A study of his progress from romantic opera to music drama will be supplemented by readings in the prose works.

Prerequisites: MUS 141, 142.

*3 credits. Not offered in 1969-70*

**MUS 361 Piano Music of the Nineteenth Century**

The repertory of the solo instrument from Beethoven to Debussy.

Prerequisites: MUS 141, 142.

*3 credits. Not offered in 1969-70*

**MUS 363 Stravinsky**

The changing stylistic manners adopted by a pivotal composer of the twentieth century.

Prerequisites: MUS 141, 142.

Miss S. Fuller

*Fall, 3 credits*

**MUS 365 Schoenberg**

The course will turn on his double role as child of an old tradition and father of a new language.

Prerequisites: MUS 141, 142.

*3 credits. Not offered in 1969-70*

**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 chairman.

*Fall and Spring, 3 credits*

## DEPARTMENT OF PHILOSOPHY

*Professors:* SIDNEY GELBER, ROBERT STERNFELD (*Chairman*), HAROLD ZYSKIND

*Associate Professors:* DON IHDE (*Visiting*), MARSHALL SPECTOR, VICTORINO TEJERA, \*WALTER WATSON, EDDY M. ZEMACH

*Assistant Professors:* EDWARD ERWIN, SIDNEY GENDIN, PATRICK J. HILL, JOHN W. LANGO, ABIGAIL ROSENTHAL

*Instructors:* DAVID BENFIELD, ANTONIO DENICOLAS, DORIS E. YOCUM

*Visiting Lecturer:* ARTHUR W. COLLINS

### 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:

1. At least one semester course from each of the following five areas:
  - I. History of Philosophy
  - II. Logic or Philosophy of Science
  - III. Epistemology or Metaphysics
  - V. Ethics, Esthetics, Political or Social Philosophy
  - IV. Study of a single philosopher or classic text

Designation of appropriate courses in terms of the above areas is indicated by Roman numbers after title of courses. For more detailed information the student should consult a departmental advisor.

2. At least three other semester courses in philosophy (but no more than one from among those numbered 101-110).

N.B. Students preparing for graduate work are advised to take additional work to that specified above. Specific information and individual advice should be sought from the student's departmental advisor.

### Courses in Philosophy

Courses numbered 101-110 are designed to serve both as introductions to philosophy and as general philosophical perspectives for the non-major. The content of each section of the multisection courses will vary; detailed information for each section is available at the philosophy office.

The most efficient introduction to philosophy for philosophy majors is the 111-112 sequence. Students who become majors after having taken courses in the

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\*On leave academic year 1969-70.

101-110 range will be given credit toward satisfying requirements for only one course in the 101-110 range.

### Honors Program in Philosophy

A student qualifying for the honors program as determined by the consensus of the philosophy faculty (and based upon his cumulative grade average and his average in philosophy courses) shall plan a program with a departmental advisor not later than the registration period of his senior year.

The program shall consist of three courses at the 390 level (usually both 398 and 399), concentrated on related aspects of a central problem, leading to a senior paper which will become the focus of an oral examination. Honors will be awarded upon passage of the examination.

### COURSES IN PHILOSOPHY

#### PHI 101 Ancient and Medieval Philosophic Classics

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.  
Staff

*Fall and Spring, 3 credits*

#### PHI 102 Modern Philosophic Classics

Readings and discussions of selected philosophic texts from the seventeenth century to the present by such philosophers as Descartes, Hume, Kant, Hegel, Nietzsche, Wittgenstein and Sartre.  
Staff

*Fall and Spring, 3 credits*

#### PHI 103 Philosophic Classics: Major Issues

Topics selected from recurrent philosophic issues from man's social, intellectual, religious and artistic experience in the traditions of western civilization.  
Staff

*Fall and Spring, 3 credits*

#### PHI 105 Innovation and Tradition

An introductory inquiry into how man shapes his thought and action to discover and

cope with new problems. Readings are drawn from such as the following: T. S. Kuhn, "The Essential Tension: Tradition and Innovation"; P. F. Strawson, *Individuals*; Heidegger, *Introduction to Metaphysics*; Plato, *Meno*; Bacon, *Novum Organum*; Ellul, *Technological Society*.

Mr. H. Zyskind

*Spring, 3 credits*

#### PHI 106 Radical Thought

An inquiry into radical criticisms of western values, with emphasis on advocates of existentialism (e.g., Nietzsche, Sartre), Marxism (e.g., Marx, Marcuse), pacifism (e.g., Thoreau, Gandhi) and violence (e.g., Sorel, Fanon).

Mr. J. Lango

*Spring, 3 credits*

#### PHI 107 Philosophic Bases of Argument

Introductory 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.

Mr. H. Zyskind

*Schedule to be announced, 3 credits*



### **PHI 108 Contemporary Philosophic Perspectives and Issues**

A representative range of philosophic problems will be presented by different philosophers. Diverse perspectives on philosophic problems will emerge from these presentations. Appropriate readings chosen by each lecturer will become the focus of discussion sections.

Staff

*Fall, 3 credits*

### **PHI 109 Introduction to Oriental Philosophy**

The course is centered around the fundamental themes of the Vision of the Vedic Seers, existence, non-existence, consciousness, time, the self and Man. These themes are made comprehensive with a study of the language of the Vedas and of the pre-supposition, basic to all the Oriental tradition, that at the origin of all manifestation (*tad*) there is a unity (*ekam*).

Mr. A. deNicolas

*Fall, 3 credits*

### **PHI 111 Major Thinkers in the History of Philosophy: Ancient and Medieval (I)**

Study of the writings of major thinkers from Plato and Aristotle to such thinkers as Lucretius, Cicero, Augustine and Aquinas on problems of metaphysics and epistemology. Related problems in other areas are treated when these are an extension or part of the central metaphysical issues. (This course was formerly listed as PHI 201.)

Miss A. Rosenthal

*Fall, 3 credits*

### **PHI 112 Major Thinkers in the History of Philosophy: Modern (I)**

Study of the writings of the major thinkers from Descartes to Kant on the problems of metaphysics and epistemology. (This course was formerly listed as PHI 202.)

Mr. M. Spector, Mr. R. Sternfeld

*Spring, 3 credits*

### **PHI 151 Ethics (IV)**

Designed to acquaint the student with the tradition of ethical inquiry and to provide

him with some of the intellectual instrumentalities needed to make valid practical judgments. Representative classical and modern works, such as those of Spinoza, Kant, William James and Sartre, are studied to make clear the character of ethical problems and the principles and methods available for their solution.

Mr. S. Gendin, Miss D. Yocum

*Fall, 3 credits*

### **PHI 152 Ethical Inquiry (IV)**

An investigation of selected ethical problems emphasizing the experiential basis required for their adequate resolution. Readings will be drawn from various disciplines—historical, biological, psychological, sociological, legal, political or literary—and are brought together in their bearing upon ethical issues.

Miss D. Yocum

*Spring, 3 credits*

### **PHI 161 Logic (II)**

The first course in logic concentrates on the subject-matter of logic in the strict sense, i.e., names, propositions and inferences, as these are treated by various logicians and used in various areas of knowledge.

Mr. D. Benfield

*Fall and Spring, 3 credits*

### **PHI 162 Symbolic Logic (II)**

This course covers topics such as: proof and rules of inference of propositional calculus, predicate logic at first order along with related concepts of normal forms, quantification, etc., metalogical concepts of consistency, completeness, decidability of a logical system, etc.

Prerequisite: PHI 161.

Mr. D. Benfield

*Spring, 3 credits*

### **PHI 201 Philosophy of Perception (III)**

An inquiry into the philosophical problems pertaining to the sensing, perceiving and observing of the world. Various historical 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.

Mr. E. Zemach

*Fall, 3 credits*

#### **PHI 211 Problems of Esthetics (IV)**

An introduction to esthetics, examining the range of its problems treated by recent and contemporary authors such as Freud, Clive Bell, Dewey, Santayana and Sartre.

Prerequisite: Sophomore standing.

Mr. E. Zemach, Mr. H. Zyskind

*Spring, 3 credits*

#### **PHI 213 Philosophy of Art (IV)**

Comparative study of various philosophies of art, with emphasis on their application to literature. Such authors are read as Plato, Kant and Croce.

Prerequisite: Sophomore standing.

Mr. V. Tejera, Mr. H. Zyskind

*Fall, 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.

Mr. H. Zyskind

*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.

Mr. S. Gelber

*Spring, 3 credits*

#### **PHI 217 Concept Formation in the Social Sciences (II)**

A critical analysis of theory construction in the social sciences with emphasis on such

concepts as model formation, typology, ideal types, function, cultural adaptation and evolution.

Prerequisites: Two semesters of biology or social science or one semester of each. (Biology is given as an alternative prerequisite because on the approach represented by this course many social science concepts, such as function or evolution, have biological analogues.)

Mr. W. Watson

*Fall, 3 credits. To be offered 1970-71*

#### **PHI 220 Philosophy of History (IV)**

A critical examination of theories of historical processes and developments, and an evaluation of such concepts as progress, cause, purpose and meaning in history. Pertinent materials will be drawn from historical and philosophic writings of such figures as Hegel, Nietzsche, Berdyaev, Collingwood and Randall.

Prerequisites: Two semesters of social science. Mr. S. Gelber, Mr. H. Zyskind

*Spring, 3 credits*

#### **PHI 228 Philosophy of Religion**

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.

Mr. D. Ihde

*Fall, 3 credits*

#### **PHI 235 Philosophy of Science: Concepts (II)**

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: PHI 102 or 112 and PHI 161.

Mr. M. Spector, Mr. R. Sternfeld

*Fall, 3 credits*

#### **PHI 236 Philosophy of Science: Structure (II)**

A systematic study of some central problems in the methodology of the sciences. The focus



is on the general structure of scientific knowledge.

Mr. M. Spector

*Spring, 3 credits*

### **PHI 237 Theories of Knowledge (III)**

This course consists of a study of a variety of conceptions of the structure of knowledge, the roles of the knower, the various kinds and status of objects known as found in classical and contemporary epistemologies.

Prerequisite: PHI 101, 102 or 103.

Mr. S. Gendin, Mr. P. Hill

*Spring, 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.

Mr. H. Zyskind

*Fall, 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.

Mr. E. Erwin

*Fall, 3 credits*

### **PHI 275 Philosophy of Law (IV)**

An examination of the philosophical principles underlying the law and an introduction to different legal philosophies. Among the

topics covered are: the relation of morality to the law, theories of criminal responsibility, theories of punishment, the idea of natural rights and natural law. Readings from Aquinas, Austin, Hart, Locke, Mill, Kelsen, Rousseau and others.

Prerequisite: Sophomore standing.  
Mr. S. Gendin

*Fall, 3 credits*

### **PHI 301 Metaphysics (III)**

An inquiry into the first principles of all science, art and action as these are treated in representative classical and modern authors. Prerequisite: PHI 111, 112 or permission of instructor.

Miss D. Yocum

*Fall, 3 credits*

### **PHI 309 Logical Theory (II)**

This course concentrates on contemporary treatments of logical problems including concepts in the philosophy of science such as truth and proof, and further treats problems in the philosophy of mathematics as these have become merged with those of logic in contemporary philosophies.

Prerequisite: PHI 161.

Mr. R. Sternfeld

*Spring, 3 credits*

### **PHI 310 Contemporary Philosophies of Experience (I)**

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 112.

Mr. R. Sternfeld

*Spring, 3 credits*

### **PHI 311 Contemporary Philosophies of Language (I)**

This course examines the modern attempt to treat all basic problems in terms of language. Readings are from authors such as Ludwig Wittgenstein, J. L. Austin, Martin Heidegger, Richard McKeon and Rudolph Carnap.

Prerequisite: One semester of philosophy.

Mr. E. Erwin

*Spring, 3 credits*

### **PHI 312 Contemporary Value Theory (IV)**

Examination of the nature and status of value judgments, emphasizing problems of verification. Articles in contemporary literature by Frankena, Lewis, Browning, Dewey, Hempel, Nagel, Scheffler, White, etc.

Prerequisite: PHI 151 or 237 or permission of instructor.

Miss D. Yocum

*Spring, 3 credits*

### **PHI 313 Existentialism (III)**

Study of the origins and relevance of contemporary existentialist writers. The implication for modern thought of Kierkegaard, Nietzsche and Husserl will be examined. Additional readings are from Buber, Camus, Heidegger, Jaspers and Sartre.

Prerequisite: PHI 112 or permission of instructor.

Mr. J. Lango, Miss A. Rosenthal

*Fall, 3 credits. Not offered in 1969-70*

### **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-Pont and Ricoeur are to be balanced by applications of phenomenological analysis to contemporary philosophical problems.

Prerequisite: At least one course in philosophy.

Mr. D. Ihde

*Spring, 3 credits*

### **PHI 315 American Philosophy (I)**

An evaluation of the major contributions in 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 112 or permission of instructor.

Mr. S. Gelber

*Spring, 3 credits*

**PHI 316 The Structure of Controversy (IV)**

A sustained inquiry into the nature and patterns of persistent disagreements and into the capacity of reason to deal with them. Focus is on such things as the formal structure of agreement and disagreement, the adequacy of our symbols, the nature of contradictory judgments and the preconditions for communal inquiry.

Prerequisite: At least one semester of philosophy or permission of instructor.

Mr. P. Hill

*Fall, 3 credits*

**PHI 320 Philosophical Psychology (III)**

A philosophical examination of the traditional and contemporary accounts of psychological concepts, such as: belief, hope, fear, pain, intention, learning and reason.

Mr. A. Collins

Prerequisite: One course in philosophy.

*Fall, 3 credits*

**PHI 330 The Methodology of Plotinus (V)**

An inquiry into the metaphysic of methodology of the so-called mystic philosopher, especially Plotinus and the influence his methodology had on philosophers like Dionysius, Meister Eckhart, Anselm of Canterbury and Nicholas of Cusa.

Prerequisite: PHI 111.

Mr. A. deNicolas

*Fall, 3 credits*

**PHI 345, 346 History and 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 EDU 345, 346.

Prerequisite: Senior standing.

Mr. R. Sternfeld

*Fall and Spring, 3 credits each Semester*

**PHI 350 Individual Systems of the Great Philosophers (V)**

A detailed study of the works of a selected, single great philosopher, with some reference both to the enduring contribution of his philosophy and its place in the history of thought.

Prerequisite: Permission of instructor.

Staff

*Fall and Spring, 3 credits each semester*

**PHI 391, 392 Advanced Seminar (V)**

This course acquaints majors in philosophy with the broad perspectives of philosophy, and they are given a major responsibility for contributing material and subject matter for discussion. Emphasis is on independent examinations of broad scope covering a wide range of writings unified by a single theme or problem.

Prerequisites: PHI 111, 112.

Staff

*Fall and Spring, 3 credits each semester*

**PHI 393, 394 Analysis of Philosophic Texts (V)**

Detailed analysis of a major text in philosophy. The course is designed to acquaint philosophy majors with the fundamental discipline of philosophy as a carefully wrought discursive argument which formulates, investigates and resolves fundamental problems.

Prerequisites: PHI 111, 112.

Staff

*Fall and Spring, 3 credits each semester*

**PHI 398, 399 Reading and Research in Philosophy (V)**

Individually supervised reading and research for senior philosophy majors. 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: Philosophy major of senior standing and permission of department.

Staff

*Fall and Spring, 1-3 credits each semester*

## PHYSICAL EDUCATION

*Associate Professor:* LESLIE F. THOMPSON (*Acting Chairman*)

*Assistant Professors:* ROLAND V. MASSIMINO, JOHN W. RAMSEY, EDITH STEPHEN,  
A. HENRY VON MECHOW

*Instructors:* DONALD J. COVELESKI, PAUL DUDZICK, LINDA I. HUTTON, JUDITH  
LAPINER, KENNETH LEE, ROBERT B. SNIDER

### Physical Education Requirement

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

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 Fail. The Pass or Fail grade is computed by evaluating the student's attendance and attitude during the semester.

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.

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.

#### PEM 100, 101 Individual and Team Sports

Fall (PEM 100) and spring (PEM 101) courses will consist of two or three sports as scheduled by the physical education office 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 be made from the following: archery, badminton, baseball, basketball, deck tennis, golf, gymnastics, handball, physical conditioning, soccer, softball, speedball, squash, table tennis, tennis, touch football, track and field, volleyball and weightlifting.

Staff

*Fall and Spring*

#### PEW 100, 101 Individual Sports

Fall (PEW 100) and spring (PEW 101) courses designed to acquaint students with rules, practice techniques, skills, visual aids and officiating of various individual sports. The fall sport for women (PEW 100) will be offered in two sections; Section 1, tennis and badminton and Section 2, golf and

squash. The spring sports for women (PEW 101) are Section 1, badminton and tennis and Section 2, fencing and archery.

Staff

*Fall and Spring*

### **PEM 102, 103 Team Sports**

Fall (PEM 102) and spring (PEM 103) courses will consist of two team sports as scheduled by the physical education office according to the availability of staff and facilities. Instruction will include the techniques, rules, strategy and social behaviors involved in team sports. Selections will be made from the following: Fall—basketball, soccer, touch football and volleyball; Spring—baseball, basketball, softball, track and field, and volleyball.

*Fall and Spring*

### **PEW 102, 103 Team Sports**

Fall (PEW 102) and spring (PEW 103) courses designed to acquaint students with rules, practice techniques, skills, visual aids and officiating of various team sports. The fall sports for women (PEW 102) include field hockey and volleyball. The spring sports (PEW 103) include basketball and softball.

Staff

*Fall and Spring*

### **PEM 104, 105 Individual Sports**

Fall (PEM 104) and spring (PEM 105) courses will consist of two or three sports as scheduled by the physical education office according to the availability of staff and facilities. Instruction will include the techniques, rules, strategy and social behaviors involved in individual sports activities. Selections will be made from the following: archery, badminton, deck tennis, fencing, golf, gymnastics, handball, physical conditioning, squash, table tennis, tennis and weightlifting.

Staff

*Fall and Spring*

### **PEW 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.

Staff

*Spring*

### **PEW 106, 107 Officiating Women's Activities**

A basic course designed to acquaint the student with the official playing rules of women's activities and the methods and techniques of officiating. National rating tests will be used in conjunction with practical experience at the local secondary schools.

Staff

*Fall and Spring*

### **PEC 106 Basic Karate-do**

A comprehensive course of work in the basic concepts of the historical and philosophical foundations and technical aspects of Karate-do.

Staff

*Fall and Spring*

### **PEC 107 Intermediate Karate-do**

A comprehensive course of work to equip the novice Karate-do player with more advanced concepts, skills, techniques and tactics.

Staff

*Fall and Spring*

### **PEM 108 Judo**

Instruction and practice in the fundamentals of judo: breakfalls, throws and grappling techniques. Limited application of skills to competitive randori (sparring) and shiai (contest).

Mr. Higashi

*Fall and Spring*

### **PEW 108 Women's Self-Defense**

Instruction and practice in the basic self-defense techniques of judo, aikido and judo-jitsu, adapted to the special needs and capacities of young women.

Mr. Higashi

*Fall and Spring*

### **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.

Staff

*Fall and Spring*

#### **PEM 110, 111 Recreational Sports**

Fall (PEM 110) and spring (PEM 111) courses will consist of one or two recreational sports as scheduled by the physical education office according to the availability of staff and facilities. The courses are designed for students interested in recreational activities. Class sections meet once a week for a double period (2½ hours). A special fee of \$35.00 is necessary for enrollment in this course. Selections will be made from the following: bowling, golf and riding.

Staff

*Fall and Spring*

#### **PEC 110, 111 Recreational Sports (Equitation)**

Fall (PEW 110) and spring (PEW 111) courses are 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 \$35.00 is necessary for enrollment.

Mrs. Johnson

*Fall and Spring*

#### **PEM 120, PEW 120 Basic Swimming**

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

Staff

*Fall and Spring*

#### **PEM 121, PEW 121 Intermediate Swimming**

Separate courses for men and women designed to equip the novice swimmer with more advanced strokes and water skills.

Staff

*Fall and Spring*

#### **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.

Staff

*Fall and Spring*

#### **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.

Mr. A. von Mechow

*Fall and Spring*

#### **PEW 124 Synchronized Swimming**

A fundamental course designed to acquaint students with various synchronized swimming stunts, natography and the organization of water ballet.

Prerequisite: Demonstration of skills with approval of instructor.

Staff

*Spring*

#### **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.

Staff

*Fall and Spring*

#### **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*).

Mr. A. von Mechow

*Fall and Spring*

#### **PEC 127 Scuba Diving**

A basic course covering selection, usage, 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.

Mr. K. Lee

*Fall and Spring*

**PEW 130 Basic Modern Dance**

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

Miss E. Stephen

*Fall and Spring*

**PEW 132 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.

Staff

*Fall and Spring*

**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.

Staff

*Spring*

**PEC 134 Intermediate Modern Dance**

Modern dance techniques on an individual level, including an introduction to dance composition.

Prerequisite: PEW 130 or permission of instructor.

Staff

*Fall and Spring*

**PEW 135 Modern Dance Teaching Methods for Elementary School Teachers**

A study of the teaching methods and materials used for teaching modern dance for ages 6-13. Simple body-building techniques—freedom of expression and therapeutic values.

Miss E. Stephen

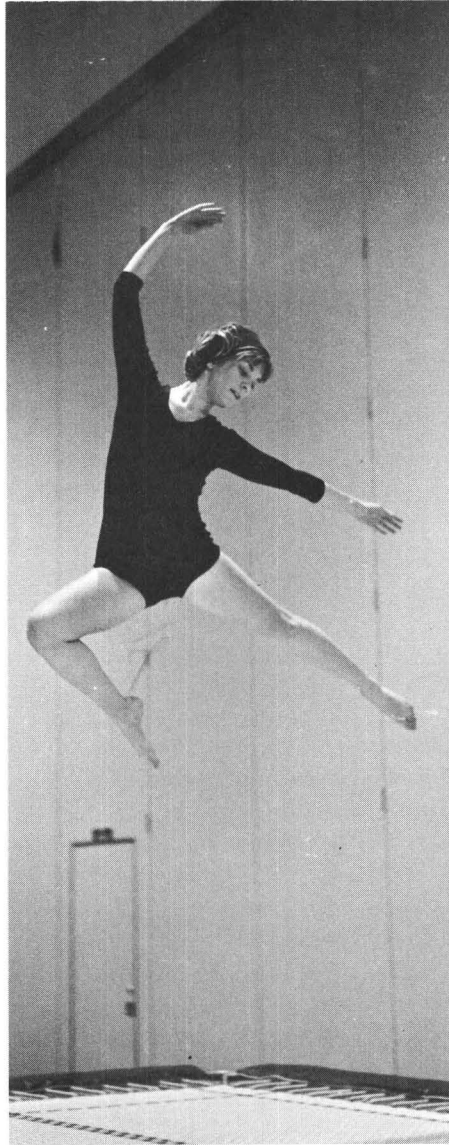
*Fall and Spring*

**PEW 140 Basic Gymnastics**

A basic course covering the four olympic pieces: free exercise, un-even parallel bar, horse and balance beam.

Staff

*Fall*

**PEW 141 Intermediate Gymnastics**

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

Staff

*Spring*

## DEPARTMENT OF PHYSICS

*Professors:* NANDOR L. BALAZS, <sup>b</sup>GERALD E. BROWN, <sup>b,f</sup>ERNEST D. COURANT, <sup>b</sup>P. A. M. DIRAC (*Visiting*), <sup>a</sup>MAX DRESDEN, LEONARD EISENBUD, ARNOLD M. FEINGOLD, GUIDO FINOCCHIARO, DAVID FOX, <sup>b</sup>MAURICE GOLDBERGER (*Adjunct*), MYRON L. GOOD, MORTON HAMERMESH (*Chairman*), DIETER KURATH (*Visiting*), <sup>g</sup>EDWARD D. LAMBE, <sup>b</sup>BENJAMIN W. LEE, <sup>c</sup>LINWOOD L. LEE, JR., HERBERT R. MUETHER, ROBERT NATHANS, T. ALEXANDER POND, HENRY B. SILSBEE, ARNOLD A. STRASSENBURG, CLIFFORD E. SWARTZ, JOHN S. TOLL, LEE WILCOX, <sup>d</sup>CHEN NING YANG (*Einstein Professor*)

*Associate Professors:* OAKES AMES, H. R. BLIEDEN (*Visiting*), <sup>e</sup>HONG-YEE CHIU, <sup>f</sup>PAUL P. CRAIG, ROBERT L. DEZAFRA, DAVID B. FOSSAN, PETER B. KAHN, YI-HAN KAO, JANOS KIRZ, T. T. S. KUO, JULIET LEE-FRANZINI, RICHARD A. MOULD, PETER PAUL, <sup>h</sup>MALCOLM H. SKOLNICK, STEPHEN STROM, <sup>e</sup>PATRICK THADDEUS (*Adjunct*)

*Assistant Professors:* JAMES A. COLE, MARGARET C. FOSTER, <sup>b</sup>DANIEL Z. FREEDMAN, <sup>b</sup>ALFRED S. GOLDBERGER, ERLEND H. GRAF, PAUL D. GRANNIS, <sup>b</sup>JOHANNES GROENEVELD, <sup>b</sup>RUDOLPH C. HWA, LESTER INGBER, ANDREW JACKSON, YONG Y. LEE, <sup>b</sup>BARRY MCCOY, ROBERT L. MCGRATH, <sup>b</sup>HWA-TUNG NIEH, <sup>b</sup>JOHN SMITH, GENE SPROUSE, KASUKE TAKAHASHI (*Visiting*), JUINN-MING WANG

A student wishing to major in physics may elect either the research degree program or the general degree program. The *research program* is designed to serve either as 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.

A student electing the research track in physics should complete PHY 101, 102, 151, 152 and MAT 102, 103, 155, 156 by the end of his second year. These constitute necessary preparation for the more intensive and formal required courses of the upperclass major. The latter courses extend his mathematical and

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<sup>a</sup> Executive Officer, Institute for Theoretical Physics.

<sup>b</sup> Member, Institute for Theoretical Physics.

<sup>c</sup> Director, Nuclear Structure Laboratory.

<sup>d</sup> Director, Institute for Theoretical Physics.

<sup>e</sup> Member, NASA Goddard, on part-time appointment at Stony Brook.

<sup>f</sup> Physicist, Brookhaven National Laboratory, on part-time appointment at Stony Brook.

<sup>g</sup> Director of Instructional Resources Center.

<sup>h</sup> Director of Medical Communications, Health Sciences Center.

experimental competences and lead serially through classical physics to a senior year in modern physics. Additional elective courses allow further substantial accomplishment in theoretical and experimental physics. Extremely able students may accelerate this program sufficiently to allow inclusion of courses from the department's graduate offerings in the senior year.

#### Required Courses for the Research Major

In addition to the general university requirements for the bachelor of science degree, the following courses are required for the major in physics:

PHY 101, 102 and 151, 152 (*General Physics*) \*

One year of chemistry or ESS 121, 122 (*Seminar in Astronomy*) or one year of another science or engineering with the approval of the chairman of the department. This requirement should be met before the junior year.

MAT 102, 103 and 155, 156 (*Calculus*) or the Honors Calculus Sequence I-IV (MAT 193-196)

PHY 201, 202 (*Electromagnetic Theory*)

PHY 211 (*Thermodynamics, Kinetic Energy and Statistical Mechanics*)

PHY 212 (*Mechanics*)

PHY 235, 236 (*Junior Laboratory*)

PHY 341, 342 (*Modern Physics*)

MAT 203, 204 (*Differential Equations and Complex Function Theory*)

Seniors preparing for further graduate study in physics are also urged to take PHY 343, 344 (*Methods of Mathematical Physics*) and/or PHY 345, 346 (*Senior Laboratory*).

The *general degree program* is designed for students who wish to acquire considerable knowledge of physics, but who do not intend to go on to graduate study in physics as preparation for a research-oriented career. This program may be useful to pre-medical students, prospective secondary school science teachers and many others having less well-defined professional goals, but who do know that they are 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.

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\*In special circumstances, students who have taken PHY 161, 162 and 261, 262 instead of PHY 101, 102 and 151, 152 will be able to enroll in the 200-level courses of the Research Degree Program. Permission of the chairman of the department is necessary, and evidence of special proficiency may be required.

### Requirements for the General Degree Program

- A. Four one-year courses in physics, two at the introductory level and two at the upperclass level. A suitable set could be PHY 161, 162 and PHY 261, 262 (*Topics in Intermediate Physics*), PHY 351, 352 (*Modern Physics*), Advanced Laboratory (to be offered in 1970-71). Other four-course sets may be chosen with the approval of the student's advisor. With careful planning, it should be possible to enter the program in the sophomore year and complete it in three years.
- B. PHY—Senior Seminar (to be offered in 1970-71).
- C. MAT 102, 103 and 155, 156 and 12 credits of other science, mathematics or science-related courses (e.g., *History of Science, Philosophy of Science, Science and Public Policy*).

### Certification for Secondary-level Science Teaching

The four one-year courses in physics and the senior seminar of the general degree program represent 32 credits. Four additional hours in any science and also 12 hours 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. With six additional hours in mathematics it is possible to obtain dual certification in physics and mathematics. Dual certification in physics and earth science or in physics and chemistry is feasible within the boundaries of the general degree program.

### Departmental Honors Program

The normal time of entry into the program will be the fall semester of the senior year. A research project leading to a senior thesis is among the requirements for departmental honors. Interested students should consult their advisors.

### COURSES IN PHYSICS

The courses General Physics I-IV are designed to present a thorough 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 and II

The first semester will be largely a study of mechanics. Topics will include kinematics and vectors; momentum; force and energy; the conservation laws; rotational motion; gravitation and planetary motion; oscillations. Use of the calculus will be introduced con-

currently with its exposition in MAT 102. A high school physics course is not required background, but is desirable. The second semester will be a study of electromagnetism. Topics include the electric field, Gauss's law and electric potential; currents; the magnetic force, sources of the magnetic field and inductance; Maxwell's equations; oscillations

and electromagnetic waves. 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, one problem-solution hour and one three-hour laboratory per week.

Corequisites: MAT 102, 103.

Mr. O. Ames and staff

*Fall and Spring, 4 credits each semester*

### **PHY 121, 122 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 relationships 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, one discussion period and one two-hour laboratory period each week.

Mr. A. Strassenburg and staff

*Fall and Spring, 3 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.

Prerequisite: Grade of C or better in PHY 101, 102. In special cases, and with the consent of instructor, this course may follow PHY 161, 162.

Corequisite: MAT 155.

Mr. H. Muether and staff

*Fall, 4 credits*

### **PHY 152 General Physics IV**

This course completes the two-year sequence in General Physics. Topics studied will include the theory of wave motion, Maxwell's equations, the propagation of electromagnetic waves in free space and in various media, geometrical and physical optics, kinetic theory, statistical mechanics, the principles of thermodynamics, specific heats and the black body radiation law. Three lecture hours and one three-hour laboratory per week.

Prerequisite: PHY 151.

Corequisite: MAT 156.

Mr. H. Muether and staff

*Spring, 4 credits*



**PHY 161, 162 Introductory Physics**

A survey of general physics with particular emphasis on the relationships between the ideas and techniques of physics and those in other areas of the sciences. The course will deal with the "classical" ideas in physics, i.e., Newtonian mechanics, conservation laws, electromagnetism and the properties of waves as applied to audio and optical phenomena; the concepts of quantum mechanics as they pertain to atomic and nuclear phenomena and the status of our understanding of high energy physics and elementary particles. Two lecture hours, one recitation hour and one three-hour laboratory per week.

Mr. C. Swartz and staff

*Fall and Spring, 4 credits each semester*

**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. Prerequisites: Junior or senior standing and permission of instructor.

Mr. L. Eisenbud

*Fall and Spring, 3 credits each semester*

**PHY 201, 202 Electromagnetic Theory**

Primarily for majors in physics. The unification of the elementary forms of the various electromagnetic equations into Maxwell's equations is reviewed and the theory is then applied to the following topics: static electric and magnetic fields, interaction of the fields with bulk matter, circuit theory, fields in resonant cavities, optics and interaction of charged particles with electromagnetic fields. The special theory of relativity is also discussed. Three class hours per week.

Prerequisites: PHY 151, 152 and MAT 155, 156, each with a grade of C or better or permission of the chairman of the Department of Physics.

Corequisites: MAT 203, 204.

Mr. J. Kirz, Mr. D. Fox

*Fall and Spring, 3 credits each semester*

**PHY 211 Thermodynamics, Kinetic Theory and Statistical Mechanics**

Designed primarily for majors in physics, 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, 152 and MAT 155, 156, each with a grade of C or better or permission of the chairman of the Department of Physics.

Corequisite: MAT 203.

Mr. P. Craig, Mr. A. Feingold

*Fall, 3 credits*

**PHY 212 Mechanics**

Primarily for majors in physics. 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: MAT 204.

*Spring, 3 credits*

**PHY 235, 236 Junior Laboratory**

Primarily for majors in physics. The main emphasis is on electrical measurements, electronics and optics, supplementing the material presented in PHY 201, 202. Two three-hour laboratories per week.

Prerequisite: Junior standing.

Corequisite: PHY 201, 202.

Mr. Y. Y. Lee, Mr. H. Blieden

*Fall and Spring, 3 credits each semester*



### PHY 239 Materials and Methods in Teaching Physical Science

Designed for prospective secondary school teachers of physics and chemistry, the course emphasizes methods and materials appropriate to the teaching of a physical science at the high school level and stresses recent curricular developments. Three class hours per week. This course is identical with CHE 239 and ESS 239.

Prerequisites: PHY 161, 162 or equivalent, CHE 101, 102, MAT 155, 156 or equivalent and concurrent study of an intermediate course in either chemistry or physics.

*Spring, 3 credits*

### PHY 261, 262 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 transport processes, phase transitions, hydrodynamics, properties of the solid state, wave motion, sound, physical and geometrical optics and atomic spectra. 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 161, 162 and MAT 102, 103; or permission of the chairman of the Department of Physics.

Mr. P. Kahn, Mr. H. Silsbee

*Fall and Spring, 4 credits each semester*

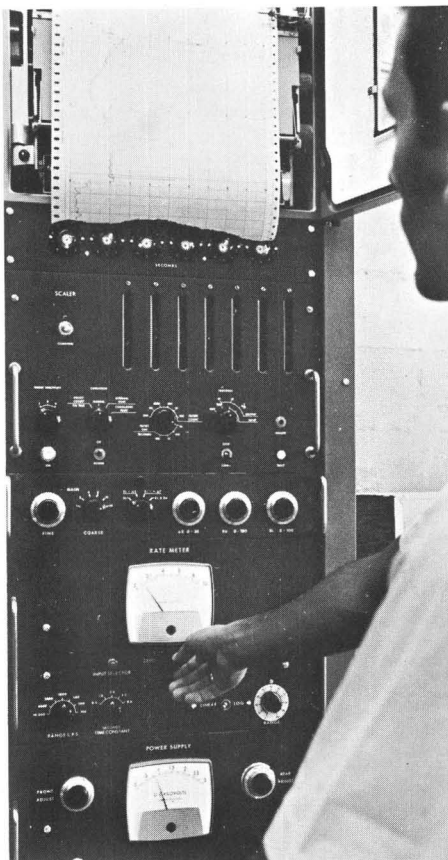
### PHY 341, 342 Quantum Mechanics and Modern Physics

Designed primarily for majors in physics, this course covers topics in atomic and molecular structure, solid state physics, nuclear physics and elementary particle physics. The phenomena requiring quantum theoretical descriptions are studied, leading to an introduction to quantum mechanics, which is then used as a tool for the investigation of other topics. Three class hours per week.

Prerequisites: PHY 201, 202, 211 and 212 and MAT 203, 204.

Mr. R. de Zafra

*Fall and Spring, 3 credits each semester*



### PHY 343, 344 Methods of Mathematical Physics

This course, designed primarily for majors in physics, 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 func-

tions, generalized function theory; probability. Three class hours per week.

Prerequisites: PHY 201, 202, 211 and 212 and MAT 203, 204 or permission of the chairman of the Department of Physics.

Mr. L. Ingber

*Fall and Spring, 3 credits each semester*

### **PHY 345, 346 Senior Laboratory**

Primarily for majors in physics. A number of the historic experiments studied in PHY 341, 342 are duplicated, but with the aid of modern instrumentation. During the second term more lengthy projects are explored in depth, with emphasis on development of experimental skills and on professionally acceptable description and analysis of results. Typical projects involve work in atomic and nuclear spectroscopy, the photoelectric effect, beta-ray spectroscopy, magnetic resonance, solid state phenomena and similar topics. In the second term, students may be called upon to formulate plans for their own experiments, based on readings in journals and reference works. Two three-hour laboratory sessions per week. Prerequisites: PHY 235, 236 or permission of the chairman of the Department of Physics. Corequisites: PHY 341, 342.

Mr. E. Graf

*Fall and Spring, 3 credits each semester*

### **PHY 351, 352 Modern Physics**

Primarily for students in the general degree program. A study of recent developments in physics, including introductions to theories of relativity and of quantum mechanics and consideration of the structure and properties of atomic, molecular and nuclear systems. Other modern developments, such as the nature of solids, low temperature physics and plasma physics, will be discussed briefly. Three lecture-recitation hours.

Prerequisites: PHY 261, 262 or permission of the chairman of the Department of Physics. Mr. M. Good

*Fall and Spring, 3 credits each semester*

### **PHY 391, 392 Research**

With the approval of the faculty, a major in the department 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 chairman of the Department of Physics.

*Fall and Spring, 2 credits each semester*

### **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 chairman of the Department of Physics.

*Fall and Spring, 2 credits each semester*

## **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 Physics  
 Nuclear Physics  
 Special Research Projects  
 Special Study  
 Solid State Physics  
 Solid State Theory  
 Theoretical Nuclear Physics  
 Advanced Quantum Mechanics  
 Elementary Particles  
 Quantum Field Theory  
 Relativity  
 Special Topics in Theoretical Physics  
 Special Topics in Nuclear Physics  
 Special Topics in Solid State Physics  
 Thesis Research

## DEPARTMENT OF POLITICAL SCIENCE

*Professors:* \*HOWARD A. SCARROW, JOSEPH TANENHAUS (*Chairman*), MARTIN B. TRAVIS, JAY C. WILLIAMS, JR.

*Associate Professors:* \*JOHN A. GARDINER, ASHLEY L. SCHIFF

*Assistant Professors:* STEPHEN J. CIMBALA, EDWARD I. FRIEDLAND, FRANK E. MYERS

*Instructors:* KENNETH P. ERICKSON, CHARLES F. LEVINE

*Lecturer:* RODNEY P. STIEFBOLD

*Visiting Lecturers:* LEE E. KOPPELMAN, JOSEPH KOTTLER

### 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 9 to 15 credits in related courses in other departments, usually at the 200-level.

Courses are distributed among the four subject areas as follows. Courses listed under two subject areas may be counted for one *or* the other area.

*American Politics:* 240 (Introduction), 221, 230, 231, 232, 241, 242, 243, 246, 249, 250, 251, 252, 254, 256, 257, 258, 299, 391, 392

*Comparative Politics:* 151 (Introduction), 209, 210, 211, 213, 214, 215, 216, 217, 218, 219, 220, 232, 299, 391, 392

*International Relations:* 225 (Introduction), 220, 221, 222, 223, 224, 226, 299, 391, 392

*Theory and Methodology:* 200 (Introduction), 201, 202, 250, 260, 261, 262, 263, 271, 272, 299, 391, 392

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\* On leave academic year 1969-70.

**COURSES IN POLITICAL SCIENCE****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.

Staff

*Fall and Spring, 3 credits*

**POL 112 Readings in Politics and Modern Society**

Significant writings dealing with such persistent political problems as democracy, elitism, equality, liberty, participation, alienation and power. Books assigned may include both classics, such as Machiavelli and Hobbes, as well as more contemporary works, including novels.

Staff

*Fall and Spring, 3 credits*

**POL 151 Contemporary Political Institutions and Processes**

Analysis of political institutions and processes in the contemporary world. Democratic, totalitarian and developing nations considered. Examples drawn from United States, Britain, Western Europe, U.S.S.R., Asia, Africa and Latin America. (This course replaces the old POL 102 and is not open to students who have taken 102.)

Staff

*Fall and Spring, 3 credits*

**POL 200 Political Analysis**

Social scientific concepts and methods as they relate to the study of political systems and political behavior. Subjects covered include the nature of scientific inquiry, explanation, systems analysis and various approaches to the study of politics, including elites, groups, power and political culture. Especially recommended for all majors.

Staff

*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.

Mr. J. Williams

*Spring, 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.

Mr. J. Williams

*Fall, 3 credits*

**POL 209 Politics in the Developing Areas**

Survey of developmental politics in selected emerging nations. Emphasis upon colonial policies prior to independence, nationalistic movements, constitution building and the emergence of leadership, parties and interest groups. Comparison of the Western and non-Western political process.

Prerequisite: Junior or senior standing.

Mr. K. Erickson

*Fall, 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.

Staff

*Spring, 3 credits*

**POL 211 Comparative Political Parties and Pressure Groups**

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.

Mr. H. Scarrow, Mr. R. Stiefbold

*Spring, 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.

Mr. F. Myers

*Fall, 3 credits*

**POL 214 Politics of Latin America**

A comparative investigation of political trends in Latin American nations. The course will include a survey of twentieth century political change, contemporary political culture, the framework and institutions of government and the interacting social and political forces of the post-World War II period. Attention will be centered on Latin America within the general pattern of political modernization, political development and prevailing ideologies. Wherever applicable, there will be an analysis of policy making and the role of political leadership.

Mr. K. Erickson

*Fall, 3 credits*

**POL 215 Contemporary Political Systems in Latin America**

Comparative analysis of selected major Latin American political systems to illustrate continuities and differences in their responses to the crises of economic, social and political modernization. Consideration of the implications of modernization by revolution and by reform, and of the impact of foreign powers on the political process in these countries.

Mr. K. Erickson

*Spring, 3 credits*

**POL 216 Democratic Politics in Western Europe**

Examination of the political process in France, Italy and Western Germany. 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.

Mr. F. Myers

*Spring, 3 credits*

**POL 217 The Politics of Nonviolent Action**

Analysis of the origin and substance of the theory and practice of nonviolent resistance as a method of influencing social and political change.

Mr. F. Myers

*Spring, 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.

Mr. R. Stiefbold

*Fall, 3 credits*

**POL 219 Soviet Politics**

A systematic examination of the political culture and political institutions of the U.S.S.R., with special attention to the changing functional and compositional characteristics of the Communist Party in the process of economic and social modernization.

Staff

*3 credits. Not offered in 1969-70*

**POL 220 Soviet Foreign Policy**

An analysis of major developments in the style and content of Soviet foreign policy from 1917 to the present, with special attention to changing patterns of interreaction of ideological and power political factors in Soviet be-

havior toward the West, the socialist countries and the "third world."

Staff

*3 credits. Not offered in 1969-70.*

#### **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.

Mr. S. Cimbala, Mr. M. Travis

*Fall and Spring, 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.

Mr. S. Cimbala

*Fall, 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.

Mr. M. Travis

*Spring, 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 re-

sponsibility, individuals, international organization, use of force.

Mr. M. Travis

*Spring, 3 credits*

#### **POL 225 Introduction to International Relations**

Introductory survey 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.

Mr. S. Cimbala, Mr. M. Travis

*Fall, 3 credits*

#### **POL 226 Problems of International Relations in Latin America**

Consideration in depth of selected problems of foreign relations in Latin America including policy formulation, inter-American community development and foreign policies of key Latin American governments.

Prerequisite: POL 223 or HIS 227 or consent of instructor.

Mr. M. Travis

*Spring, 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, representations, race relations, censorship, religion in government, defendants' rights.

Mr. M. Reichler, Mr. J. Tanenhaus

*Fall and Spring, 3 credits*

#### **POL 231 The American Judicial System**

Analysis of structure and decision-making processes of American judicial system.

Mr. J. Gardiner

*3 credits. Not offered in 1969-70*

#### **POL 232 Comparative Judicial Processes**

The role of courts, lawyers, judges and in-

terest groups in the American and selected foreign political systems.

Mr. J. Tanenhaus

*Spring, 3 credits*

#### **POL 240 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.

Mr. A. Schiff

*Fall, 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.

Staff

*Spring, 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.

Staff

*Spring, 3 credits*

#### **POL 243 Politics of New York State**

Analysis of parties, pressure groups and the political process in New York State. Particu-

lar attention paid to the legislative process in Albany.

Mr. J. Kottler

*Fall, 3 credits*

#### **POL 246 Urban Politics**

Analysis of the formal structure and political processes of American cities with emphasis on the role of political parties, elites and interest groups.

Mr. J. Gardiner, Mr. C. Levine

*Spring, 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.

Mr. L. Koppelman

*Spring, 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.

Mr. A. Schiff

*Spring, 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.

Mr. A. Schiff

*Fall, 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.”

Mr. C. Levine

*Spring, 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 federation” related to the process and the relationships between planning and general governmental decision making.

Mr. L. Koppelman

*Fall, 3 credits*

**POL 256 Problems of Urban Areas**

Analysis of the basic problems confronting local governments in the United States. Topics to be considered include poverty, housing, crime, race relations and city planning.

Mr. J. Gardiner, Mr. C. Levine

*Spring, 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.

Mr. E. Friedland

*Spring, 3 credits*

### **POL 258 Public Policy**

An approach to the making of public policy (especially American). How various participants—e.g., Congress—make policy; how policy is made in substantive areas—e.g., agriculture; what systematic theory emerges from the policy miasma.

Mr. C. Levine

*Fall, 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.

Mr. J. Williams

*Fall, 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.

Mr. J. Williams

*Spring, 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.

Mr. J. Williams

*Spring, 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.

Mr. E. Friedland

*Fall, 3 credits*

### **POL 271 Quantitative Methods in Political Science**

Introduction to basic concepts and techniques of statistical inference and model construction in political science. The application of quantitative methods to the study of political behavior and the formulation of public policy. Special emphasis will be placed upon developing student familiarity with the computer as a research tool.

Mr. E. Friedland

*Fall, 3 credits*

### **POL 272 Advanced Topics in Quantitative Political Analysis**

Investigation of key issues in the methodology of political science. Topics to be covered include: general system theory, quantitative approaches to the study of power, the mathematics of democratic theory, causality and statistical inference, stochastic modeling and the simulation of political behavior.

Prerequisite: POL 271 or permission of instructor.

Mr. E. Friedland

*Spring, 3 credits*

### **POL 299 Directed Readings in Political Science**

Individually supervised reading in selected topics of the discipline.

Staff

*Fall and Spring, 1 to 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.

Staff

*Fall and Spring, 3 credits each semester*

## DEPARTMENT OF PSYCHOLOGY

*Professors:* JOHN GARCIA, HARRY I. KALISH (*Chairman*), LEONARD KRASNER (*Director Clinical Training*), MARVIN LEVINE, FRANCIS H. PALMER, ALAN O. ROSS, JOHN S. STAMM, EVERETT J. WYERS

*Associate Professors:* DANA BRAMEL, \*GERALD C. DAVISON, JAMES H. GEER, MARVIN R. GOLDFRIED, \*\*H. WILLIAM MORRISON, DAVID M. POMERANZ (*Director Psychological Services*), HOWARD RACHLIN, JEROME E. SINGER, STUART VALINS

*Assistant Professors:* \*\*\*THEODORE DOLL, THOMAS J. D'ZURILLA, DAVID EMMERICH, LESTER G. FEHMI, JEFFERSON FISH, RONALD FRIEND, JON BARRY GHOLSON (*Visiting part-time*), RICHARD KESTENBAUM, FREDRIC M. LEVINE, JOHN M. NEALE, K. DANIEL O'LEARY, ROGER SCHVANEVELDT, MARIUS C. SMITH, SARAH STERNGLANZ, SHELDON WEINTRAUB, JOSEPH L. YOUNG

### 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*)
  - PSY 200 (*Experimental Methodology*)
  - 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
  - MAT 102 or 193 or equivalent
  - BIO 101, 102 or two courses in biology with laboratory
  - Two courses in anthropology and/or sociology

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

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\* On leave academic year 1969-70.

\*\* Associate in Instructional Resources.

\*\*\* Member, Institute for Research in Learning.

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: computing 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 101, 102 Introduction to Psychology**

An introduction to psychology as the science of behavior. The first semester provides an intensive investigation of the major research areas covering learning, perception and the physiological foundations of behavior. The second semester offers an introduction to the areas of personality theory, testing and social psychology.

Prerequisite for PSY 102: PSY 101.

Staff

*Fall and Spring, 3 credits each semester*

### **PSY 162 Statistical Methods in Psychology**

Designed to provide the student with a knowledge of the use and interpretation of elementary statistical techniques in research. Emphasis is placed on descriptive statistics, correlational analysis and inferential statistics, including chi-square, critical ratio, t, F and certain selected non-parametric techniques. Two lecture sessions and a one-hour laboratory each week.

Prerequisites: PSY 101, 102 and MAT 102.

Staff

*Fall and Spring, 3 credits*

### **PSY 200 Experimental Methodology**

An introduction to experimental methodology as applied to psychological processes: conditioning, motivation, psychophysiology of emotion, sensory and perceptual processes and symbolic mediation.

Prerequisites: PSY 101, 102, 162.

Staff

*Fall and Spring, 4 credits*

### **PSY 201 Laboratory in Perception**

A study of the techniques and experimental problems in perception and sensation with emphasis on the visual, auditory and tactual senses. The role of motivation and selective attention on the detection and recognition of stimuli will be investigated.

Prerequisite: PSY 200.

Staff

*Fall and Spring, 4 credits*

### **PSY 202 Laboratory in Physiological Psychology**

A study of the techniques and experimental problems in the neurophysiological basis of behavior. Techniques and problems relating to sensation, perception, motivation, learning and memory will be investigated.

Prerequisite: PSY 200.

Staff

*Fall and Spring, 4 credits*

### **PSY 203 Laboratory in Personality**

A study of the techniques and experimental problems in personality. This course will deal with selected topics in personality derived from most of the prominent theories. Experiments will serve to illustrate many of the major propositions from these theories of personality.

Prerequisite: PSY 200.

Staff

*Fall and Spring, 4 credits*

### **PSY 204 Laboratory in Social Psychology**

A study of the techniques and experimental problems in social psychology. Techniques will include natural observation, surveys and experimental design.



Prerequisite: PSY 200.

Staff

*Fall and Spring, 4 credits*

### **PSY 206 Laboratory in Learning and Performance**

A study of 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.

Staff

*Fall and Spring, 4 credits*

### **PSY 208 Theories of Personality**

Contemporary theories of personality will be studied with emphasis on the experimental literature pertaining to personality development. Current methods of personality assessment in the applied areas will also be considered.

Prerequisites: PSY 101, 102.

Staff

*Fall, 3 credits*

### **PSY 209 Social Psychology**

A survey of basic social psychology: communication, attitude formation and change, social perception, interpersonal relations and group performance. This course is intended for students who do not plan to take laboratory work in social psychology.

Prerequisites: PSY 101, 102; not open to students who have taken PSY 309.

Staff

*Fall and Spring, 3 credits*

### **PSY 210 Empirical and Theoretical Studies of Social Conflict**

Classical and current views of social conflict will be considered. Emphasis will be placed on recent empirical and mathematical studies, and a number of laboratory exercises will illustrate contemporary methods in the study of social conflict. The views of Plato, Machiavelli and others will be compared and contrasted with current empirical and theoretical work.

Prerequisites: PSY 101, 102 and permission of instructor.

*Spring, 3 credits*

### **PSY 211 Developmental and Adolescent Psychology**

A study of the hereditary, maturational and learning factors responsible for the personality development of the human organism from birth through adolescence. Emphasis will be on the theoretical research aspects of social learning from the point of view of modified behaviorism and modern cognitive social psychology.

Prerequisites: PSY 101, 102.

Staff

*Fall and Spring, 3 credits*

### **PSY 213 Behavior Deviation in Children**

The major focus will be the development and modification of behavioral deviations in children. After an examination of principles derived from the experimental analysis of behavior, applications of these principles to children's problems such as self-destructive behavior, retardation, autism, phobias and classroom management problems will be studied.

Prerequisites: PSY 211 and permission of instructor.

Staff

*Fall and Spring, 3 credits*

### **PSY 215 Abnormal Psychology**

The major categories of psychopathology, including the neuroses and functional and organic psychoses, will be examined. Emphasis will be placed on an analysis of current research in psychopathology and its relationship to the theories of abnormal behavior.

Prerequisites: PSY 101, 102.

Staff

*Fall and Spring, 3 credits*

### **PSY 219 Learning and Motivation**

A critical examination of the basic concepts, empirical findings and theoretical interpretations in the experimental study of learning and motivation.

Prerequisites: PSY 101, 102.

Staff

*Fall and Spring, 3 credits*

### **PSY 244 Comparative Psychology**

This course will be concerned with the phylogenetic distribution and evolution of both learned and unlearned behavior patterns with an emphasis on the former. Such phenomena as kineses, taxes, instinct, respondent and operant conditioning, generalization and discrimination will be considered.

Prerequisites: PSY 101, 102 and BIO 101 or equivalent.

Staff

*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. This course is intended for students who wish a rigorous discussion of these topics or who intend to proceed to laboratory work in social psychology.

Prerequisite: PSY 162; not open to students who have taken PSY 209 (except by permission of instructor).

Staff

*Fall and Spring, 3 credits*

### **PSY 322 Advanced Statistics**

Survey of probability and sampling theory, descriptive and inferential statistics and introduction to experimental design. This course is intended for the advanced undergraduate doing independent study and extensive reading in the basic literature or for undergraduates who plan to do graduate work in behavioral science.

Prerequisite: PSY 162 or permission of instructor.

Staff

*Fall and Spring, 3 credits*

### **PSY 330, 331 Research in Psychology**

Selected senior majors in psychology will be offered a laboratory apprenticeship. The work consists of laboratory or field work by the student 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.

Staff

*Fall and Spring, 1 to 3 credits each semester, may be repeated*

### **PSY 332, 333 Readings in Psychology**

Senior majors in psychology will be afforded the opportunity to read selectively under the guidance of a faculty member.

Prerequisites: Major in psychology, senior standing and permission of department chairman.

Staff

*Fall and Spring, 1 to 3 credits each semester, may be repeated*

**PSY 340 Physiological Psychology**

This course will consider in detail the evolution of the nervous system with an emphasis on integrative processes and their relationship to behavior.

Prerequisites: PSY 101, 102 and BIO 101 or equivalent.

Staff

*Spring, 3 credits*

**PSY 341 Introduction to the Nervous System**

Comparative survey of gross and microscopic anatomy, physiology and integrative capacities of nervous systems from coelenterates to mammals including a consideration of integrative capacities of non-neural systems such as protozoa, porifera and mesozoans. Emphasis will be on the relation of increasing structural complexity of nervous systems to their integrative capabilities.

Prerequisite: BIO 201.

Staff

*Fall, 3 credits*

**PSY 343 Seminar in Synaptic Processes**

The morphological, ionic, pharmacological and electrical factors associated with transmission across excitatory and inhibitory synapses and neuro-effector junctions will be compared. Consideration will also be given to trophic and plastic properties of synapses such as those associated with development, regeneration and learning. Open to juniors and seniors.

Prerequisite: PSY 340.

Staff

*Spring, 2 credits*

**PSY 352 History and Systems of Psychology**

The history and present status of conceptual trends in psychology. The development of psychological principles and theories will be traced from the early Greek philosophers through the European philosophers and empiricists to their embodiment in contemporary psychological theory.

Prerequisite: Nine credits of psychology.

Staff

*Spring, 3 credits*

**PSY 362 Sensation—Perception**

An introduction to the phenomena of sensation and perception and the methods by which they may be studied. Different theoretical frameworks will also be considered.

Prerequisites: PSY 101, 102.

Staff

*Fall and Spring, 3 credits*

**PSY 372 Tests and Measurements**

A study of selected principles of psychological measurement with emphasis upon mental tests. Materials will include a brief survey of statistical bases for the construction of and evaluation of tests and an examination of selected examples of tests primarily in personality, intelligence and achievement.

Prerequisites: PSY 101, 102 and permission of instructor.

*Fall, 3 credits*

**PSY 381, 382 Introduction to Mathematical Psychology**

A study of mathematical formulations of theories of behavioral phenomena, with emphasis on learning. Attention will be paid to the process of turning intuition into theory, the mathematical tools and techniques needed to derive testable consequences of theoretical assumptions and the process of evaluating such theories in the light of empirical evidence. The student will complete an individual project in the second term.

Prerequisites: PSY 162 and MAT 103 or permission of instructor.

*Fall and Spring, 3 credits each semester*

**PSY 391, 392, 393 Special Topics in Psychological Research and Theory**

A seminar to be offered to selected senior majors and to be organized by the faculty member who will deal with current research and theory in areas of special interest to him. Topics will be announced prior to the beginning of each semester.

Prerequisites: PSY 200 and permission of instructor.

Staff

*Fall and Spring, 3 credits each semester*



## DEPARTMENT OF ROMANCE LANGUAGES

*Professors:* KONRAD BIEBER, LINETTE F. BRUGMANS, OSCAR A. HAAC, G. NORMAN LAIDLAW (*Chairman*)

*Associate Professors:* FREDERICK BROWN, JAMES B. MCKENNA, LEONARD R. MILLS, IRIS M. ZAVALA

*Assistant Professors:* HARRIET R. ALLENTUCH, CAROL BLUM, DIANA M. CAPUTO, CARL T. ERICKSON, JAIME GIORDANO, THOMAS MERMALL, J. ENRIQUE OJEDA (*Academic Secretary*), D. SANDY PETREY, ANTHONY RIZZUTO, JOSEPH A. TURSI, KATHLEEN WILKINS, ELIO ZAPPULLA

*Instructors:* MIGUEL BARCELÓ, NICOLE BECKER, LISA DAVIS, MERYL EASSON, ALFRED EHRENFELD, ELLEN ENGELSON, JEREMIAH FALLON, GABRIELA GREENFIELD, JOHN F. HUGHES, GABRIEL LANDAU, PATRICIA LEWIS, GIORGIO PERISSINOTTO, NORMAN POULIN, ELIZABETH RIGGS, CHARLES SCLAFANI, KAREN SMYLEY, AMY VANDERLYN, THOMASINE WALLACE, ELLEN WECKER

In addition to the general university requirements for the bachelor of arts degree, the following must be met:

### Requirements for the Major in French

Language: 15 credits

FRN 221 (*French Conversation and Composition*)

FRN 222 (*Readings and Discussion of Modern Authors*)

FRN 321 (*Language Usage—Spoken*)

FRN 322 (*Language Usage—Written*)

FRN 396 (*Advanced French Language Seminar*)

Literature: 21 credits

FRN 297 (*Major Writers I*)

FRN 298 (*Major Writers II*)

FRN 397 (*Senior Literature Seminar*)

In addition to the above courses, the French majors must select a minimum of 12 credits in courses numbered above 300; teacher-training candidates may substitute six credits in education courses for departmental offerings.

### Requirements for the Major in Spanish

Language: 15 credits

SPN 221, 222 (*Conversation and Composition I, II*)

- SPN 321        (*Language Usage—Spoken*)  
 SPN 322        (*Language Usage—Written*)  
 SPN 396        (*Advanced Spanish Language Seminar*)

Introduction to Literature: 9 credits

- SPN 297, 298 (*Introduction to Hispanic Literature I, II*)  
 SPN 341        (*Introduction to Cervantes*)

Literature: 12–15 credits

In consultation with a departmental major advisor, each major will choose one of the following programs of literary studies, to follow SPN 298:

Program A: 12 credits

Designed for students who seek a broad understanding of the language, literature and culture of the Spanish-speaking peoples, this program will prepare students for careers in teaching, industry and public service. One semester course is required in each of the following areas:

- I. Golden Age
- II. Twentieth Century (Spain)
- III. Twentieth Century (Spanish America)
- IV. Literary areas not covered in I-III,  
       courses in civilization, language

Program A majors are encouraged to enroll in courses in a second language and in related courses in such departments as fine arts, music, history and anthropology.

Program B: 15 credits

Designed for students who plan to do graduate study in Romance languages:

- I. One semester course in each of the areas listed under Program A; no more than *one* of the intermediate level literary courses may be included, i.e., SPN 297, 298, 307, 308
- II. SPN 397 (*Senior Hispanic Literature Seminar*)

Program B majors are urged to acquire proficiency in at least one other Romance language and to take the Graduate Record Examination during their senior year.

## Placement

Entering students will be placed in appropriate courses on the basis of high school years (or college semesters) of previous language study. After two years of high school preparation, students 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. "Language proficiency" is normally defined as the level of achievement attained in course 192.

## Advising

Students wishing to major in French or Spanish will consult with departmental advisors to arrange individual programs.

## Teacher Training Program

Students interested in securing a teacher's certification should consult with the department concerning requirements and procedures of the teacher training program.

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## COURSES IN FRENCH

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### FRN 100 Reading French

An introduction for graduate students to attain a basic reading knowledge of French.

*Fall and Spring, no credit*

### FRN 111, 112 Elementary French

An introduction to spoken and written French, stressing pronunciation, speaking, comprehension, reading and writing. Practice in the language laboratory supplements class work.

*Fall and Spring, 3 credits each semester*

### FRN 115 Intensive Elementary French

An intensive course covering the Elementary French program (111, 112) in one semester.

*Fall and Spring, 6 credits each semester*

### FRN 191, 192 Intermediate French

An intermediate course in conversation, composition and the interpretation of French

texts. Practice in the language laboratory supplements class work.

Prerequisite: FRN 112 or equivalent.

*Fall and Spring, 3 credits each semester*

### FRN 195 Intensive Intermediate French

An intensive course covering the Intermediate French program (191, 192) in one semester.

Prerequisite: FRN 112 or equivalent.

*Fall and Spring, 6 credits each semester*

### FRN 199 Conversational French (French Residence I)

Conversational usage and style.

Prerequisites: FRN 112 or equivalent and permission of instructor.

*Fall and Spring, 3 credits each semester*

### FRN 200 Conversational French (French Residence II)

Advanced conversational usage and style.

Prerequisites: FRN 199 or equivalent and permission of instructor.

*Fall and Spring, 3 credits each semester*

**FRN 221 French Conversation and Composition**

A course in the active use of spoken and written French. At least one additional hour per week of work in the language laboratory is required.

Prerequisites: FRN 192 or 195 and permission of instructor.

*Fall, 3 credits*

**FRN 222 Readings and Discussion of Modern Authors**

*Explication de texte*, oral and written reports. Prerequisites: FRN 221 and permission of instructor.

*Spring, 3 credits*

**FRN 297 Major Writers in French through the Eighteenth Century**

Reading and interpretation of selected works by great French writers from the Middle Ages to the eighteenth century. Works are treated in the context of the history of French literature.

Prerequisite: FRN 192 or 195 or permission of instructor.

*Fall, 3 credits*

**FRN 298 Major Writers in French since the Nineteenth Century**

Reading and interpretation of selected works by great French writers from the nineteenth century to the present. Works are treated in the context of the history of French literature. Prerequisite: FRN 297 or permission of instructor.

*Spring, 3 credits*

**FRN 321 Language Usage—Spoken**

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 weekly laboratory practice will be required. Prerequisites: FRN 221 and 222, and permission of instructor.

*Fall, 3 credits*

**FRN 322 Language Usage—Written**

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 and 222, and permission of instructor.

*Spring, 3 credits*

**FRN 334 Renaissance Prose**

The work of the major French prose writers of the sixteenth century, in the intellectual and cultural context of the Renaissance.

Prerequisites: FRN 297 and 298, or permission of instructor.

*Spring, 3 credits*

**FRN 343 French Classical Theatre**

Reading of selected works by Corneille, Racine and Molière.

Prerequisites: FRN 297 and 298, or permission of instructor.

*Fall, 3 credits*

**FRN 344 French Classical Prose and Poetry**

Reading of texts from such authors as Pascal, La Rochefoucauld, La Bruyère, Madame de Sévigné, Madame de Lafayette, Saint-Simon, La Fontaine.

Prerequisites: FRN 297 and 298, or permission of instructor.

*Spring, 3 credits*

**FRN 351 French Literature in the Eighteenth Century I**

Reading of selected literary works of the Enlightenment from 1685 to 1750.

Prerequisites: FRN 297 and 298 or permission of instructor.

*Fall, 3 credits*

**FRN 352 French Literature in the Eighteenth Century II**

Reading of selected works of Diderot, Rousseau and their contemporaries.

Prerequisites: FRN 297 and 298, or permission of instructor.

*Spring, 3 credits*

**FRN 361 Nineteenth Century French Literature I**

Studies in French romanticism from Chateaubriand to Hugo.

Prerequisites: FRN 297 and 298, or permission of instructor.

*Fall, 3 credits*

**FRN 362 Nineteenth Century French Literature II**

Studies in French realism, naturalism and symbolism.

Prerequisites: FRN 297 and 298, or permission of instructor.

*Spring, 3 credits*

**FRN 365 Poetry Since Baudelaire**

A study of the major poets and "schools" since romanticism, with discussion of changing poetic practices and doctrines. Critical readings in Baudelaire, Rimbaud, Mallarmé and Verlaine with explication of individual poems.

Prerequisites: FRN 297 and 298, or permission of instructor.

*Fall, 3 credits*

**FRN 371 The Modern French Theatre**

Representative French playwrights from Alfred Jarry to the present with particular emphasis on the post-war theatre.

Prerequisites: FRN 297 and 298, or permission of instructor.

*Fall, 3 credits*

**FRN 373 Modern French Fiction to 1945**

Critical reading and interpretation of French fiction in the twentieth century with emphasis on Proust and Gide.

Prerequisites: FRN 297 and 298, or permission of instructor.

*Fall, 3 credits*

**FRN 374 Modern French Fiction since 1945**

Critical readings with emphasis on Malroux, Sartre, Camus.

Prerequisites: FRN 297 and 298, or permission of instructor.

*Spring, 3 credits*

**FRN 376 Twentieth Century Poetry**

A study of the major poets from Apollinaire to St. John Perse. Explication of individual poems.

Prerequisites: FRN 297 and 298, or permission of instructor.

*Spring, 3 credits*

**FRN 382 The Literature of Commitment in France**

Literature of commitment and the reaction against commitment in the twentieth century. Selected readings, prose, poetry, drama and essays centered around the theme.

Prerequisites: FRN 297 and 298, or permission of instructor.

*Spring, 3 credits*

**FRN 390 Pensée et Culture (French Civilization)**

French writers and artists and their interpretation of society. The intellectual and cultural climate of modern France.

Prerequisites: FRN 297 and 298, or permission of instructor.

*Fall and Spring, 3 credits*

**FRN 396 Advanced French Language Seminar**

This seminar is intended to develop the student's skill in the use of the French language both written and oral, as well as to provide an adequate approach to the history and theory of the French language.

Prerequisite: FRN 322 or equivalent.

*Spring, 3 credits*

**FRN 397 Senior Literature Seminar**

This seminar is intended to provide the major with an overall view of French literature.

Prerequisites: Senior standing and permission of instructor.

*Fall and Spring, 3 credits*

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**COURSES IN ITALIAN**


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**ITL 111, 112 Elementary Italian**

An introduction to spoken and written Italian, stressing pronunciation, speaking, com-

prehension, reading and writing. Selected texts will be read. Practice in the language laboratory supplements class work.

*Fall and Spring, 3 credits each semester*

### **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 equivalent.

*Fall and Spring, 3 credits each semester*

### **ITL 221 Italian Conversation**

A course in spoken Italian. At least one hour of laboratory is required.

Prerequisites: ITL 192, language proficiency or permission of instructor.

*Fall, 3 credits*

### **ITL 222 Readings and Discussion of Modern Authors**

Readings, explication, oral and written reports.

Prerequisite: ITL 221 or permission of instructor.

*Spring, 3 credits*

### **ITL 297 Major Writers in Italian to the Eighteenth Century**

Discussion of representative Italian writers from St. Francis of Assisi to Giuseppe Parini. The works read are treated in the context of the history of Italian literature.

Prerequisite: ITL 192 or permission of instructor.

*Fall, 3 credits*

### **ITL 298 Major Writers of Italian of the Nineteenth and Twentieth Centuries**

Discussion of representative writers and currents in the nineteenth and twentieth centuries in Italian literature. The works read are treated in the context of the history of Italian literature.

Prerequisite: ITL 192 or permission of instructor.

*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 *Paradiso*.

Prerequisite: ITL 327.

*Spring, 3 credits*

### **ITL 332 Italian Literature of the Renaissance**

The study of the *Orlando Furioso* by Ariosto and the *Gerusalemme Liberata* by Tasso, together with selected works of Lorenzo de Medici, Poliziano, Machiavelli, Castiglione, Michelangelo and Bambo.

Prerequisites: ITL 297, 298.

*Spring, 3 credits*

## **COURSES IN PORTUGUESE**

### **POR 111, 112 Elementary Portuguese**

An introduction to spoken and written Portuguese, stressing pronunciation, speaking, comprehension, reading and writing. Selected texts will be read. Practice in the language laboratory supplements class work.

*Fall and Spring, 3 credits each semester*

### **POR 191, 192 Intermediate Portuguese**

An intermediate course in conversation, composition and the interpretation of Portuguese texts. Practice in the language laboratory will further develop audiolingual skills.

Prerequisite: POR 112.

*Fall and Spring, 3 credits each semester*

## **COURSES IN SPANISH**

### **SPN 109 Masterpieces of Spanish Literature in Translation**

Readings from *El Cid*, the picaresque novel, Cervantes, golden century drama and significant contemporary authors.

*Fall, 3 credits*

**SPN 110 Masterpieces of  
Spanish-American Literature  
in Translation**

Masterpieces of the "modernismo" and recent poetry, contemporary novel and essay.  
*Spring, 3 credits*

**SPN 111, 112 Elementary Spanish**

An introduction to spoken and written Spanish, stressing pronunciation, speaking, comprehension, reading and writing. Practice in the language laboratory supplements class work.

*Fall and Spring, 3 credits each semester*

**SPN 115 Intensive Elementary Spanish**

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

*Fall and Spring, 6 credits each semester*

**SPN 191, 192 Intermediate Spanish**

An intermediate course in conversation, composition and the interpretation of Spanish texts. Practice in the language laboratory.  
Prerequisite: SPN 112 or equivalent.

*Fall and Spring, 3 credits each semester*

**SPN 195 Intensive Intermediate Spanish**

An intensive course covering the intermediate Spanish program (191, 192), in one semester.  
Prerequisite: SPN 112 or equivalent.

*Fall and Spring, 6 credits*

**SPN 221 Spanish Conversation and  
Composition I**

A course in the active use of spoken and written Spanish. At least one additional hour per week of work in the language laboratory is required.

Prerequisites: SPN 192 or 195, language proficiency and permission of instructor.

*Fall, 3 credits*

**SPN 222 Spanish Conversation and  
Composition II**

A course in the active use of spoken and written Spanish. A discussion of texts.

Prerequisites: SPN 221 and permission of instructor.

*Spring, 3 credits*

**SPN 297 Introduction to Hispanic  
Literature I**

Theories and practice of literary analysis and scholarship through readings of representa-





tive works of Hispanic literature.  
Prerequisite: SPN 192 or equivalent.  
*Fall, 3 credits*

**SPN 298 Introduction to Hispanic Literature II**

Readings and practice of literary analysis and scholarship through readings of representative works of Hispanic literature.  
Prerequisite: SPN 192 or equivalent.  
*Spring, 3 credits*

**SPN 307 Spanish-American Literature from the Sixteenth to the Nineteenth Century**

Reading and interpretation of selected works by representative writers of Spanish America during the colonial period and the nineteenth century.  
Prerequisites: SPN 297 and 298, or permission of instructor.  
*Fall, 3 credits*

**SPN 308 Spanish-American Literature of the Twentieth Century**

Reading and interpretation of selected works by representative writers of Spanish America during the twentieth century.  
Prerequisites: SPN 297 and 298, or permission of instructor.  
*Spring, 3 credits*

**SPN 321 Language Usage—Spoken**

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.  
Prerequisites: SPN 222 and permission of instructor.  
*Fall, 3 credits*

**SPN 322 Language Usage—Written**

A course designed to acquaint students with the subtleties of Spanish grammar and style. Extensive practice in composition and in translation from English to Spanish.  
Prerequisites: SPN 321 and permission of instructor.  
*Spring, 3 credits*

**SPN 324 History of the Spanish Language**

A historical survey of the phonetics, morpho-syntax and lexicon of Castilian Spanish from the Roman conquest to the present.  
Prerequisites: Introductory course in linguistics and language proficiency.  
*Spring, 3 credits*

**SPN 341 Introduction to Cervantes**

A consideration of the literary career of Cervantes including lyrics, theatre, novels, short stories and *Don Quixote*.  
Prerequisites: SPN 297 and 298, or permission of instructor.  
*Fall, 3 credits*

**SPN 342 Spanish Drama of the Golden Age**

An analysis of several of the most representative plays by Lope de Vega, Calderón de la Barca, Tirso de Molina and others.  
Prerequisites: SPN 297 and 298, or permission of instructor.  
*Spring, 3 credits*

**SPN 343 Spanish Prose of the Golden Age except Cervantes**

An examination of the major prose genres beginning with the *Celestina* and including courtly, picaresque and pastoral narration as well as mystic and historical prose.  
Prerequisites: SPN 297 and 298, or permission of instructor.  
*Fall, 3 credits*

**SPN 344 Spanish Poetry of the Golden Age**

An examination in depth of Spanish poetic literature from the late Middle Ages to the Baroque, from the Cancioneros to Góngora.  
Prerequisites: SPN 297 and 298, or permission of instructor.  
*Spring, 3 credits*

**SPN 372 Spanish Novel from Galdós to the Generation of 1898**

Representative novels of the period. Special emphasis will be given to the historical novel

of Galdós, Unamuno, Baroja and Valle-Inclán.

Prerequisites: SPN 297 and 298, or permission of instructor.

*Spring, 3 credits*

### **SPN 373 The Generation of 1898**

A study of selected works of Gaiivet, Unamuno, Azorin, Valle-Inclán, Ortega y Gasset, Machado, Pérez de Ayala and Baroja.

Prerequisites: SPN 297 and 298, or permission of instructor.

*Fall, 3 credits*

### **SPN 374 Spanish Poetry from Bécquer to the Generation of 1927**

Spanish poetry from Bécquer to Lorca and the Generación del 27. Special emphasis will be placed on the different post-war "ismos" and on the influence of the Spanish Civil War on certain poets like Machado, Miguel Hernandez, Alberti.

Prerequisites: SPN 297 and 298, or permission of instructor.

*Spring, 3 credits*

### **SPN 375 Contemporary Spanish-American Novel**

A study of contemporary Spanish-American novelists: Asturias, Carpentier, Yañez, Fuentes, Cortazar, etc.

Prerequisites: SPN 297, 298.

*Fall, 3 credits*

### **SPN 376 Contemporary Spanish-American Poetry**

A study of contemporary Spanish-American poetry, including Dario, Gabriela Mistral, Vallejo, Neruda, Paz, Fernández and Cardenal as individual poets and as representatives of the principal trends.

Prerequisites: SPN 297 and 298, or permission of instructor.

*Spring, 3 credits*

### **SPN 378 Contemporary Spanish-American Essay**

The quest for identity in the contemporary Spanish-American essay, since *Ariel* of Rodó 1900, Carlos O. Bunge, José Vasconcelos, Alfonso Reyes, Eduardo Mallea, José C.

Mariátequi, Mariano Picón-Salas, Jorge Mañach, Leopoldo Zea, Octavio Paz and Ezequiel Martínez Estrada will be among the writers to be discussed.

Prerequisites: SPN 297, 298, or permission of instructor.

*Spring, 3 credits*

### **SPN 388 Spanish Essay in the Eighteenth and Nineteenth Centuries**

The essay in the eighteenth and nineteenth centuries, including Feijoo, Jovellanos and such major costumbristas as Mesonero Romanos and Larra.

Prerequisites: SPN 297 and 298, or permission of instructor.

*Spring, 3 credits*

### **SPN 390 Spanish Civilization**

Spanish writers and artists and their interpretation of society. The intellectual and cultural climate of modern Spain.

Prerequisites: SPN 297 and 298, or permission of instructor.

*Spring, 3 credits*

### **SPN 393 Spanish-American Civilization**

The reality of Spanish America, as seen through some of its artists, historians, writers and public figures.

Prerequisites: SPN 307 and 308, or permission of instructor.

*Fall, 3 credits*

### **SPN 396 Advanced Spanish Language Seminar**

Intended to develop the student's skill in the use of the Spanish language both written and oral, as well as to provide an adequate approach to the history and theory of the Spanish language.

Prerequisite: SPN 322 or equivalent.

*Spring, 3 credits*

### **SPN 397 Senior Hispanic Literature Seminar**

Intended to provide the major with an overall view of Spanish literature.

Prerequisites: Senior standing and permission of instructor.

*Fall and Spring, 3 credits*

## INTERDISCIPLINARY PROGRAM 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:

1. Two courses in *each* of any *two* social science departments.
2. Four courses \* in each of any two other social science departments; at least two courses in each department must be beyond the introductory level.
3. Two additional courses in any social science department or departments, both of which must be beyond the introductory level.
4. Two courses in related areas (i.e., education, philosophy, computer science, linguistics) approved by the advisor.

Courses for the social sciences major may be chosen from among the following departments: \* anthropology, economics, history, political science, psychology, sociology.

For further information about the social science major, consult the Office of the Provost for Social and Behavioral Sciences.

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\*When interdisciplinary social science courses are approved, they may be substituted for any departmental course requirements over two.



## DEPARTMENT OF SOCIOLOGY

*Professors:* LEWIS A. COSER (*Distinguished Professor*), ROSE L. COSER (*Adjunct*), KURT LANG, HANAN C. SELVIN (*Chairman*), EUGENE WEINSTEIN

*Associate Professors:* O. ANDREW COLLVER, KENNETH A. FELDMAN, JOHN H. GAGNON, NORMAN GOODMAN, NED POLSKY

*Assistant Professors:* STEPHEN D. BERGER, STEPHEN COLE, HARVEY A. FARBERMAN, ERICH GOODE, CLINTON HERRICK, JAMES R. HUDSON, GAYE TUCHMAN, \*SASHA WEITMAN

*Instructor:* RAYMOND MAURICE

*Lecturer:* JUDITH TANUR

### Requirements for the Major in Sociology

#### A. Study within the area of the major

SOC 103 (*Introduction to Sociology*)

SOC 201 (*Research Methods in Sociology*)

SOC 361 (*Historical Development of Contemporary Sociology*)

SOC 362 (*Introduction to Sociological Theory*)

A total of at least 30 credits must be taken in sociology. Qualified seniors may register for graduate courses to be chosen in consultation with the student's advisor. Any course taken in the department may also be used to fulfill the university social science requirement.

SOC 202 (*Statistical Methods*) is strongly recommended for a major in sociology, but is not required.

#### B. Study in related areas \*

One year of mathematics to be chosen in consultation with the advisor. (Note: This may also be used to fulfill the university science requirement.)

Two courses beyond the introductory sequence in related social science, to be chosen in consultation with the student's advisor.

### Honors Program

We are currently planning an honors program. All students interested in such a program should request further information at the department office.

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\* On leave academic year 1969-70.

**COURSES IN SOCIOLOGY****SOC 101 Contemporary Society**

The basic characteristics of modern industrial society, such as population growth, urbanization, technological change and bureaucratic organization.

Miss G. Tuchman

*Fall and Spring, 3 credits*

**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.

Mr. J. Hudson, Mr. E. Weinstein

*Fall and Spring, 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.

Staff

*Fall and Spring, 3 credits*

**SOC 201 Research Methods in Sociology**

Methods of collecting and analyzing empirical data to test sociological hypotheses. Emphasis will be on multivariate analysis of tabular and statistical data.

Prerequisite: SOC 103 or permission of instructor.

Mr. R. Maurice

*Fall and Spring, 3 credits*

**SOC 202 Statistical Methods in Sociology**

An introduction to the use and interpretation of statistical methods in social research; descriptive and inferential statistics.

Prerequisite: SOC 103 or permission of instructor.

Mrs. J. Tanur

*Fall and Spring, 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.

Staff

*Fall, 3 credits*

**SOC 204 Courtship, Marriage and the Family**

The structure and functions of the family as a social institution; social factors affecting courtship, mate selection and engagement; dynamics of marital adjustment and parenthood.

Prerequisite: SOC 103 or permission of instructor.

Mr. J. Gagnon

*Fall and Spring, 3 credits*

**SOC 205 Principles of Sociology**

An introduction for non-sociology majors who are juniors or seniors, emphasizing major sociological works and ideas.

Prerequisites: SOC 103 and permission of instructor.

Mr. S. Cole

*Fall, 3 credits*

**SOC 207 Social Problems**

How social problems emerge and change, focusing on such topics as population imbalance, poverty, generational conflict, urban decay, race relations and alienation in mass society.

Prerequisite: SOC 103 or permission of instructor.

Staff

*Fall and Spring, 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.

Staff

*Fall, 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.

Staff

*Spring, 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.

Mr. S. Berger

*Spring, 3 credits*

### **SOC 235 Sociology of Religion**

The ways in which sociocultural processes affect and are influenced by religious belief systems and organizations; changing structures and functions of religious institutions.

Prerequisite: SOC 103 or permission of instructor.

Staff

*Fall, 3 credits*

### **SOC 236 Technology and Social Change**

Technological and organizational preconditions of economic development; social implications of automation and other changes in technology.

Prerequisite: SOC 103 or permission of instructor.

Mr. C. Herrick

*Fall, 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.

Mr. N. Polsky, Mr. E. Goode

*Fall and Spring, 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.

Mr. N. Polsky

*Spring, 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.

Mr. K. Feldman, Mr. N. Goodman

*Fall and Spring, 3 credits*

### **SOC 243 Sociology of Youth**

Adolescent socialization; age structures and intergenerational conflict; peer groups and youth subcultures.

Prerequisite: SOC 103 or permission of instructor.

Mr. N. Goodman

*Fall, 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.

Staff

*Fall, 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.

Staff

*Fall, 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.

Staff

*Spring, 3 credits*

**SOC 256 Political Sociology**

Social structures 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.

Mr. J. Hudson

*Fall, 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.

Mrs. R. Coser

*Spring, 3 credits*

**SOC 262 Mass Communications**

Social influences on the content and effects of mass communications; communication systems; the public functions of mass communication.

Prerequisite: SOC 103 or permission of instructor.

Mr. R. Maurice

*Spring, 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.

Staff

*Fall, 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.

Mr. O. Collver

*Fall, 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.

Staff

*Spring, 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.

Mr. C. Herrick

*Fall and Spring, 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.

Staff

*Fall, 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.

Staff

*Fall, 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.

Mr. K. Lang

*Fall, 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.

Mr. H. Farberman

*Fall and Spring, 3 credits*





### **SOC 362 Introduction to Sociological Theory**

A systematic treatment of the dominant general orientations in sociology including structural functional analysis and symbolic interactionism.

(Note that course number SOC 362 formerly referred to Sociology Today.)

Prerequisite: SOC 103 or permission of instructor.

Mr. L. Coser

*Fall, 3 credits*

### **SOC 363 Sociology Today**

Recent advances in research, theory and method in the field of sociology.

(Note that this course was formerly numbered SOC 362.)

Prerequisites: SOC 361 and SOC 362.

Staff

*Fall, 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.

Prerequisites: SOC 103, major in sociology, senior standing and permission of instructor.

Staff

*Fall and Spring, 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.

Staff

*Fall and Spring, 1 to 3 credits each semester*

## DEPARTMENT OF THEATRE ARTS

*Professors:* JAN KOTT, JOHN NEWFIELD

*Associate Professors:* JACKSON G. BARRY, WILLIAM J. BRUEHL (*Chairman*), RICHARD F. HARTZELL, MILTON B. HOWARTH

*Assistant Professor:* THOMAS G. NEUMILLER

*Instructor:* ROGER B. BOND

### Requirements for the Major in Drama and Theatre

In addition to the general university requirements for the bachelor of arts degree, the following courses are required for the major in theatre arts:

#### A. Basic courses required of all theatre arts majors

	<i>Credits</i>
THR 131 ( <i>The Nature of Drama</i> )	4
THR 134 ( <i>The Visual Aspects of the Theatre</i> )	4
THR 136 ( <i>Acting I</i> )	4
THR 235 ( <i>History of the Theatre I</i> )	3
THR 240 ( <i>History of the Theatre II</i> )	3
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#### B. An additional set of courses chosen according to the prescription for (a) a major with emphasis on performance or (b) a major with emphasis on the theory and history of drama and theatre.

##### (a) Study within the area of the major, with emphasis on performance

Five upper level courses in the performing area	15 credits
Two upper level courses in the area of theory and history (not counting THR 235 and 240)	6 credits
Production	3 credits

(All majors in the performing area are required to participate in three major University Theatre productions in at least two different capacities, and are given three credits over the span of four years.)

##### (b) Study within the area of the major, with emphasis on the theory and history of drama and theatre

Six upper level courses in theory and history (not counting THR 235 and 240)	18 credits
One course in directing	3 credits
One additional course in the performance area	3 credits

## COURSES IN THEATRE ARTS

### 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.

Mr. W. Bruehl and staff

*Fall, 4 credits*

### THR 133 Voice and Diction

An introduction to those elements of voice production essential to the craft of acting. Developing the speaking voice. Drill in correct English usage. Recordings and analysis of the speech of each student with prescribed corrective exercises.

*Fall and Spring, 3 credits*

### THR 134 The Visual Aspects of the Theatre

An introduction to the principles of design. Designing for the stage; the set, the costume, the lighting. The role of the designer and his relationship to director, actor and audience. Lecture, colloquia, assigned readings.

Mr. M. Howarth, Mr. R. Bond

*Fall and Spring, 4 credits*

### THR 135 The Forms and Traditions of Modern Theatre

A course designed to introduce the general student to the nature of drama and theatre in the modern world, to the basic elements of

theatre arts, and to important contemporary and modern drama examined in the full dimensions of projected productions. Each student, during the semester, is expected to see and evaluate a professional Broadway (or off-Broadway) play in performance.

Mr. T. Neumiller and staff

*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.

Mr. J. Barry, Mr. T. Neumiller

*Fall and Spring, 4 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.

Mr. R. Hartzell

*Fall, 3 credits*

### THR 232 The Fundamentals of Technical Theatre

The planning, construction and handling of stage scenery and properties.

Prerequisite: THR 134 or permission of



instructor.  
Mr. R. Bond  
*Fall and Spring, 3 credits*

### **THR 235 History of the Theatre I**

An historical survey of theatre architecture, staging methods, scenic design and styles of production including the Classical through the Renaissance periods with special emphasis on the social, religious and cultural backgrounds.  
Mr. J. Newfield  
*Fall, 3 credits*

### **THR 236 Stage Costume**

An introduction to the history and aesthetics of stage costumes and the fundamentals of costume design. The technique of theatrical make-up.  
Prerequisite: THR 134 or permission of instructor.  
Mr. M. Howarth  
*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.  
Mr. T. Neumiller  
*Spring, 3 credits*

### **THR 239 Directing**

The process of selecting the play and preparing its production. Problems of interpretation. The production book.  
Prerequisite: Permission of instructor.  
Mr. W. Bruehl  
*Fall, 3 credits*

### **THR 240 History of the Theatre II**

An historical survey of theatre architecture, staging methods, scenic design, and styles of production including the Baroque and Rococo periods and the nineteenth century to 1880 with special emphasis on the social, religious and cultural backgrounds.  
Prerequisite: THR 235 or permission of instructor.

Staff  
*Spring, 3 credits*

### **THR 331 Scene Design**

Perspective and mechanical drawing for the stage. Principles of designing for the theatre, including color composition. These techniques are related to the aesthetics both of dramatic composition and the flexibility of modern staging.  
Prerequisite: THR 232 or permission of instructor.  
Mr. M. Howarth  
*Fall, 3 credits*

### **THR 332 The Dramatic Image of the Renaissance**

The changing ideas of life in the Renaissance and the drama that reflects them will be traced through the classical revival in Italy, the merger of the humanist and popular traditions in England and the flowering and decline of the Tudor-Stuart Theatre.  
Prerequisite: Permission of instructor.  
Mr. J. Barry  
*Spring, 3 credits*

### **THR 336 Projects in Stage Design**

Practice in stage design; analysis and expression of the play in scenic terms. Individual work.  
Prerequisites: THR 331 and permission of instructor.  
Mr. M. Howarth  
*Spring, 3 credits*

### **THR 337 Greek Tragedy and the Modern Theatre**

The nature of Greek tragedy and its relevance to the contemporary world and its theatre. This course is identical with GER 337.  
Prerequisite: Permission of instructor.  
Mr. J. Kott  
*Fall, 3 credits*

### **THR 338 Stage Lighting**

Basic theories of stage lighting approached from a technical and an aesthetic viewpoint, leading to the practical planning of light plots for individual plays.

Prerequisite: THR 232 or permission of instructor.

Mr. R. Bond

*Spring, 3 credits*

### **THR 339 Theories and Types of Comedy**

An investigation of the comic experience in drama stressing great classical and modern comedies. Readings in the pertinent critical literature.

Prerequisite: Permission of instructor.

Mr. J. Barry

*Spring, 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.

Mr. T. Neumiller and staff

*Fall, 3 credits*

### **THR 342 History of the Theatre in the American Colonies and the United States**

A course designed for majors and non-majors focusing on the history of theatre and drama in America from 1750 to the present. Emphasis will be placed on the political, social and cultural conditions that influenced the development of the physical theatre and the dramatic literature.

Prerequisite: Permission of instructor.

*Spring, 3 credits. Not offered in 1969-70*

### **THR 343 Readings in the Theory of the Modern Stage**

A detailed and critical investigation of the theories which revolutionized the modern theatre. Readings from Appia, Brecht, Artaud, Yeats, etc.

Prerequisite: Permission of instructor.

Mr. J. Newfield

*Fall, 3 credits*

### **THR 344 Projects in Directing**

An opportunity for advanced work in individual projects in stage direction.

Prerequisites: Junior-senior standing and permission of instructor.

Mr. W. Bruehl and staff

*Spring, 3 credits*

### **THR 345 Experimental Theatre Workshop**

A production project of an advanced nature will be undertaken by one or more members of the departmental faculty and students of junior and senior standing.

Prerequisites: Junior-senior standing and permission of instructor.

Mr. W. Bruehl and staff

*Fall and Spring, 3 credits each semester*

### **THR 346 Directions in Contemporary Drama and Theatre**

An exploration of the forms and movements which are radically changing the face of today's theatre.

Prerequisite: Permission of instructor.

Mr. J. Kott

*Spring, 3 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.

Mr. J. Newfield

*Fall and Spring, 3 credits*

### **THR 348 Dramatic Literature and Theatre from Romanticism to Naturalism**

The theatre and its literature from the time of Goethe to the rise of the naturalistic drama.

Prerequisite: Permission of instructor.

Mr. J. Newfield

*Spring, 3 credits*

### **THR 349 Structure in Theatre and the Other Arts**

Structure as a basic organizational concept in the modern arts and in the philosophy, science and technology which they reflect.

Prerequisites: Junior-senior standing and permission of instructor.

Mr. J. Barry

*Fall, 3 credits*

**INTERDEPARTMENTAL COURSES IN WORLD LITERATURE****WL 101 The Classical Tradition**

Studies in major writers from Homer to Vergil. General lectures followed by discussion in small groups.

Staff

*Fall, 3 credits*

**WL 102 The Judaeo-Christian Tradition**

Studies in major texts, from the Bible through the medieval period. General lectures followed by discussion in small groups.

Staff

*Spring, 3 credits*

**WL 104 The Renaissance**

Studies in major European writers of the Renaissance. General lectures followed by discussion in small groups.

Staff

*Spring, 3 credits*

**WL 107 Romanticism**

A survey of the phenomenon of romanticism in literature and art through the works of

leading literary figures of the period in Europe and America from Rousseau to Melville. Lectures on romantic artists and composers as well as literary figures. Small discussion groups.

Mr. E. Zappulla and staff

*Fall, 3 credits*

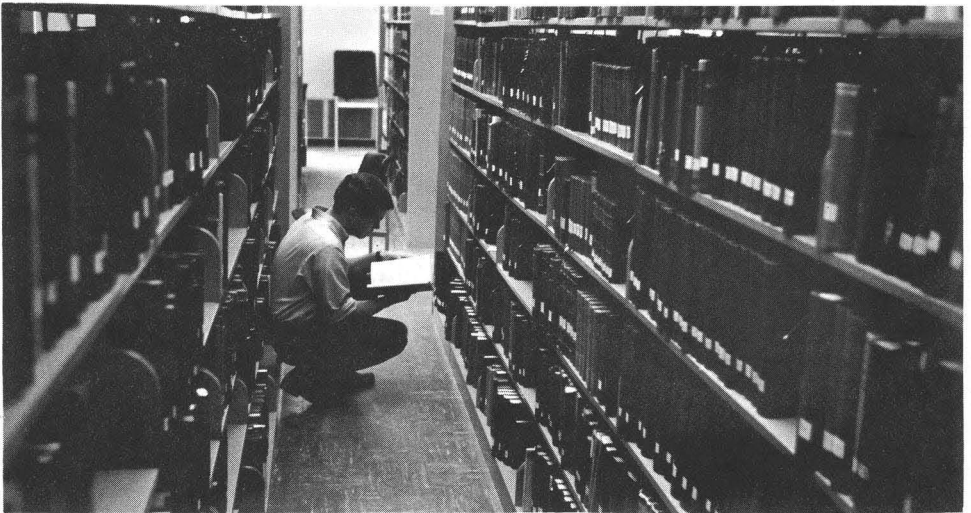
**WL 346 The Modern European Drama**

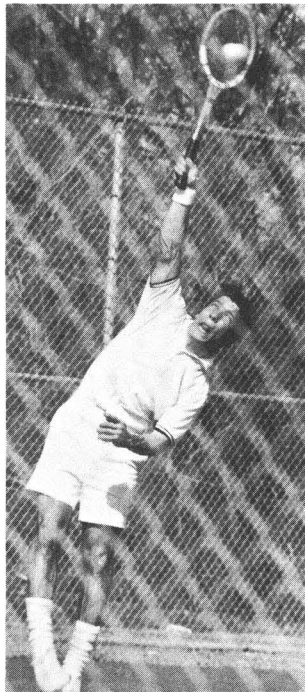
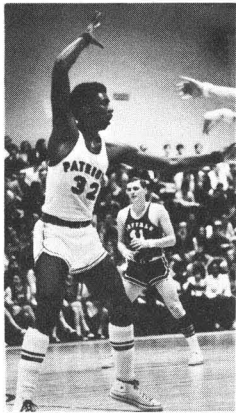
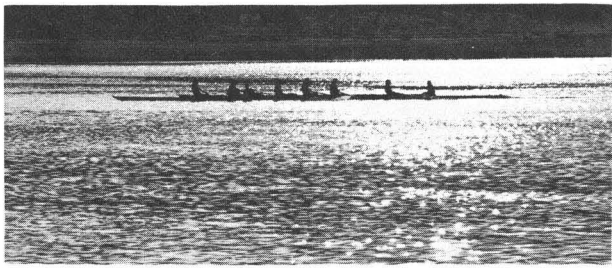
A critical examination of the development of dramatic literature in Europe from Ibsen to Anouilh, including a comparative study of such movements as naturalism, existentialism and expressionism.

Mr. K. Bieber

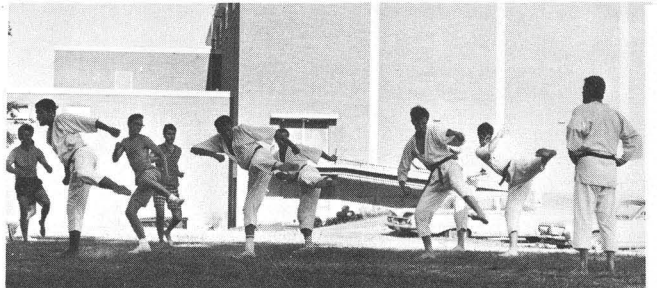
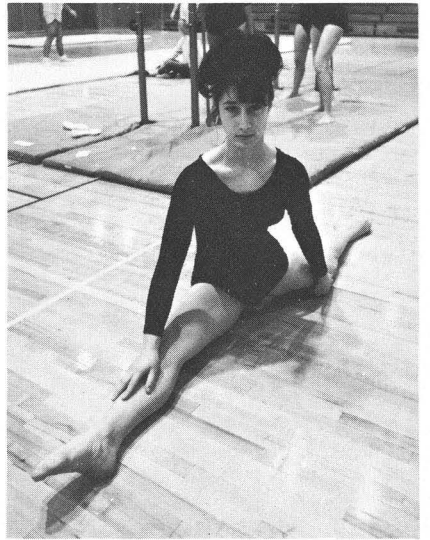
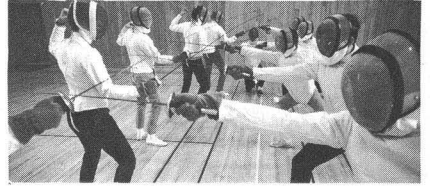
*Spring, 3 credits*

Note: Students interested in additional literature courses in English should consult the departmental offerings in English, Germanic and Slavic languages, Romance languages and theatre arts.









## COLLEGE OF ENGINEERING

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### Program in Engineering Science

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 in engineering design. In addition, the curriculum embraces broad training in the arts and humanities, social and behavioral sciences, and communications.

Traditional engineering departments are not represented at the State University at Stony Brook since engineering science is concerned with areas of knowledge which are fundamental to all of the conventional engineering fields. 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 computing 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, which generally are influenced by economic and social considerations.

Programs of graduate work with specialization in the various engineering departments are offered. (For further information see the *Graduate Bulletin*.)

### Requirements for the Bachelor of Engineering Degree—126 Credits

A student will be recommended by the faculty for the degree upon completion of the requirements listed in sections A and B below.

- A. General university program and natural science requirements (45 credits):  
Credit for, or exemption from, each of the following is required of all candidates:

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An engineering student interested in a later medical degree should participate in the pre-medical advisement program.

Arts and Humanities	6 credits
Chemistry 101, 105; 102, 106	9 credits
English 101	3 credits
Mathematics 102, 103, 155	9 credits
Physics 101, 102, 151	12 credits
Social and Behavioral Sciences	6 credits
Physical Education	2 semesters

A student should complete all of the courses listed in section A by the end of his second year. The natural science courses (chemistry, mathematics and physics) provide the necessary preparation for the engineering science concentration requirements.

Courses in physical education may be completed any time during the four years.

Courses to meet the arts and humanities requirement are to be chosen from the following (except foreign language skill courses): humanities, art, English, Germanic and Slavic languages and literatures, music, philosophy, Romance languages, theatre arts and world literature.

Courses to meet the social and behavioral sciences requirement are to be chosen from the following: anthropology, economics, history, political science, psychology and sociology.

**B. Engineering science concentration requirements:**

Every student must meet the requirements of a program of concentration in engineering science approved by the faculty of the College of Engineering.

**1. Required Courses (57 credits):**

Credit for, or exemption from, each of the following is required of all candidates:

ESG 101, 202	<i>Thermodynamics I, II</i>	6 credits
ESG 211, 212	<i>Engineering Laboratory I, II</i>	6 credits
ESG 121, 222	<i>Applied Mathematics I, II</i>	8 credits
ESG 232, 233	<i>Materials Science I, II</i>	8 credits
ESG 340, 341	<i>Engineering Design I, II</i>	6 credits
ESG 151	<i>Graphic Arts</i>	3 credits
ESG 251, 252	<i>Electrical Sciences I, II</i>	8 credits
ESG 161, 263, 264	<i>Mechanics I, II, III</i>	9 credits
ESG 162	<i>Introduction to Computing Science</i>	3 credits

A student may gain an exemption from a required engineering course by petitioning the College of Engineering curriculum committee and by arranging with the current instructor to take a comprehensive examination (e.g., the final examination) along with the 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.

2. Required distribution of elective courses (24 credits):

The distribution of the 24 credits in elective courses required of all candidates is given below:

a. Technical electives (12 credits):

- (1) any engineering departmental or interdepartmental elective courses.
- (2) any engineering first-year graduate courses open to undergraduates. A student wishing to take an engineering graduate course must have a cumulative grade-point average of 3.0 or better, and the approval of the instructor. He should apply to the departmental office for information on the graduate courses currently open to undergraduates.
- (3) any courses from the natural sciences (biological sciences, chemistry, earth and space sciences, mathematics and physics) approved by individual petition to the curriculum committee of the College of Engineering.

b. 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.

c. Open electives (6 credits):

Any courses offered by the University for credit at any level.

### **Possible Undergraduate Sequence**

The four-year sequence of courses presented below is given as an aid in planning an undergraduate program leading to the bachelor of engineering degree. However, any sequence which satisfies the requirements stated above may be equally appropriate and should be discussed with the student's academic advisor.

**First Year**

<i>Ist Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
English 101 .....	3	*ESG 151 Graphic Arts .....	3
Arts and Humanities .....	3	Arts and Humanities .....	3
Mathematics 102 .....	3	Mathematics 103 .....	3
Physics 101 .....	4	Physics 102 .....	4
Social and Behavioral Sciences	3	Social and Behavioral Sciences	3
	16		16

**Second Year**

<i>Ist Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
*ESG 162 Introduction to Computing Science	3	ESG 101 Thermodynamics I ..	3
Chemistry 101 .....	4	ESG 121 Applied Mathematics I	4
Chemistry 105 .....	1	ESG 161 Mechanics I .....	3
Mathematics 155 .....	3	Chemistry 102 .....	3
Physics 151 .....	4	Chemistry 106 .....	1
Elective (Non-Technical) ....	3	**Elective (Non-Technical) ..	3
	18		17

**Third Year**

<i>Ist Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
ESG 202 Thermodynamics II .	3	ESG 212 Engineering Lab. II .	4
ESG 211 Engineering Lab. I ..	2	ESG 222 Applied Mathematics II ....	4
ESG 232 Materials Science I ..	4	†ESG 233 Materials Science II	4
ESG 251 Electrical Sciences I ..	4	†ESG 252 Electrical Sciences II	4
ESG 263 Mechanics II .....	3	†ESG 264 Mechanics III .....	3
	16		19

**Fourth Year**

<i>Ist Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
ESG 340 Engineering Design I	2	ESG 341 Engineering Design II	4
Elective (Technical) .....	3	Elective (Technical) .....	3
Elective (Technical) .....	3	Elective (Technical) .....	3
Elective (Open) .....	3	Elective (Open) .....	3
	11+		13

\*May be taken in either semester.

\*\*Must be at a level beyond the introductory sequence in a given area.

†Any of these courses may be taken during the senior year. The student should schedule his courses so that he may take his technical electives in the areas of his interests and, subject to prerequisite requirements, these may be begun in the junior year.

## Exemptions

A student may gain an exemption from any of the course requirements specified in section B above by submitting a petition together with supporting material to the College of Engineering curriculum committee.

## Pass-Fail Option

The only courses which may be taken on a pass/fail basis by engineering majors are those fulfilling the arts and humanities, social and behavioral sciences, 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
- ESI: Interdepartmental courses offered by the College of Engineering
- ESA: Courses offered by the Department of Applied Analysis
- 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

Courses are numbered in accordance with the following general pattern:

- 101 - 199 freshman-sophomore courses
- 200 - 399 junior-senior courses
- 500 - 699 graduate courses

## REQUIRED ENGINEERING COURSES FOR PROGRAM OF CONCENTRATION

### ESG 101 Thermodynamics I

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: MAT 155.

*Fall and Spring, 3 credits each semester*

### ESG 121 Applied Mathematics I: Multivariate Calculus

Differential calculus of functions of several variables: functions of several variables, domains and regions, level curves and level surfaces, limits and continuity, partial derivatives, total differential, chain rule for derivatives and differentials of functions, implicit functions, inverse functions, Jacobians, functional dependence, partial derivatives of higher order, maxima and minima of functions of several variables. Vector differential calculus: vector functions of a

single variable, derivative of a vector function, vector and scalar fields, gradient field, divergence of a vector, curl of a vector, directional derivatives, curvilinear coordinates, transformation of coordinates and its effect on operators of differentiation. Integral calculus of functions of several variables: double integrals, triple and multiple integrals, repeated integrals, change of variables of integration, change of order of integration, arc length; surface area and volume; integrals depending on a parameter, numerical evaluation of multiple integrals. Vector integral calculus: line integrals in the plane, basic properties of line integrals, line integrals as integrals of vectors, Green's theorem, independence of path. Line and surface integrals in space, orientability of a surface, divergence theorem, Stokes theorem, irrotational and solenoidal fields. Functions of a complex variable: complex number system, sequences and series of complex numbers, functions of a complex variable, limits and continuity, sequences and series of functions, uniform convergence, derivatives and differentials, analytic functions, Cauchy-Riemann equations, integration of complex functions, Cauchy's integral theory, Cauchy's integral formula, Laurent series, Taylor series, classification of singularities, calculus of residues and contour integration. Laplace transform, definition and elementary properties, inversion formula.

Prerequisite: MAT 155.

*Spring, 4 credits*

### **ESG 151 Graphic Arts**

A broad introduction to the principles of graphic art. Attention is paid to the perspective and projection problems connected with architectural and mechanical subjects, to rendering techniques, to drawing in mixed media and to the achievement of speed and accuracy. Class work covers free-hand drawing and sketching through finished drawing using mechanical drafting tools and lettering. At each stage the student studies and discusses the work of such artists as Uccello, Da Vinci, Dürer, Fulton and Morse. Six laboratory hours.

*Fall and Spring, 3 credits each semester*

### **ESG 161 Mechanics I: 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: ESG 121 Applied Mathematics I.  
Prerequisites: PHY 151, MAT 155.

*Spring, 3 credits*

### **ESG 162 Introduction to Computing Science**

The course consists of three parts. The first part is an introduction to basic computer organization and a working knowledge of the Fortran language as a communication medium with the digital computer. The second part makes use of the acquired skills in practicing the solution of engineering problems appropriate to computing science. The final third serves as a basic introduction to computing science in general, with emphasis on computer programming systems structure. Practical and illustrative problems are solved in laboratory sessions, using the IBM 360/67 computer and an individual course project is assigned requiring the demonstration of capability in the computing medium.

Prerequisite: MAT 102.

*Fall and Spring, 3 credits each semester*

### **ESG 202 Thermodynamics II**

The course starts with a review of the basic notions of probability and statistics and a discussion of the microscopic nature of systems of special interest. The fundamental problem of statistical thermodynamics—to relate the microscopic properties to the bulk properties of a system—is then considered. The relationship between entropy and information, and also between fluctuation and noise, will be pointed out and applications to problems associated with kinetic theory, the heat capacity of gases and solids, radiation and imperfect gases will be studied.



Prerequisite: ESG 101 Thermodynamics I  
*Fall, 3 credits*

**ESG 211 Engineering Laboratory I:  
 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 212 Engineering Laboratory II:  
 Engineering Experimentation**

The study of electronic instrumentation in scientific research is continued. Additional considerations are: establishing the experimental environment, introduction to and uses of dimensional analysis, pure empiricism and its uses, details of methods of experimental analysis, including experimental planning, data analysis and interpretation of results, selected experimental examples and problems which supplement the lectures. Individual projects are encouraged.

Prerequisite: ESG 211 Engineering Laboratory I.

*Spring, 4 credits*

**ESG 222 Applied Mathematics II: Partial  
 Differential Equations**

Classification of second order partial differential equations, reduction to canonical forms, Cauchy data. Laplace's equation in curvilinear coordinates, separation of variables, maximum principle, mean value property, Harnack's theorem, Dirichlet's problem, Fourier series, half-range Fourier series, uniqueness of Fourier series, integration and differentiation of Fourier series, least square approximation, Bessel's inequality. Parseval's theorem, Fourier transform, convolution, Parseval's relation. Conformal mapping, linear fractional transformations, Dirichlet's problem for the half-plane, applications of conformal mapping in hydrodynamics and elasticity. Wave equation in two dimensions,

D'Alembert's solution, characteristics, properties of the solutions of wave equations, vibration of strings, circular membranes, etc. Diffusion equation, properties of solutions, applications to conduction of heat in solids. Numerical analysis: arithmetic of approximation; round-off error; significant figures. Polynomial approximation; interpolation and finite differences. Numerical solution of linear and non-linear systems of algebraic equations. Numerical differentiation. Numerical integration. Numerical solution of ordinary differential equations. Numerical solution of partial differential equations (Laplace's two-dimensional equation only). The use of these techniques in solving linear and non-linear differential equations. Use of the computer in applying these numerical techniques.

Prerequisites: ESG 121 Applied Mathematics I.

*Spring, 4 credits*

**ESG 232 Materials Science I: Structure  
 and Mechanical Properties**

A review of binding forces in molecules and crystals is followed by a study of the structure of perfect crystals. Various imperfections which can exist in real lattices, such as surfaces, grain boundaries, twins, stacking faults, dislocations, voids and point defects are treated physically and mathematically. The molecular structure of polymers is considered as well as the nature of amorphous phases in plastics and glasses. The influence of structure and lattice imperfections upon the elastic, plastic and fracture properties of metals, ceramics and polymers is considered. Next attention is focused upon phase equilibrium and diffusion in multicomponent systems and the mechanisms of phase transformations in solids. The role of such transformations in structural control, i.e., in modifying materials to produce desired properties is treated, with examples from various alloy, ceramic and polymer systems.

Prerequisites: CHE 102, PHY 151, ESG 101 Thermodynamics I.

*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. ESG 232 Materials Science I is not a prerequisite.

*Spring, 4 credits*

### **ESG 251, 252 Electrical Sciences I, II**

These two courses together comprise a unified introduction to the field of electrical sciences. The application of electromagnetic and network theory will be approached from the functional requirements of engineering systems. The topics to be covered will include the following: Maxwell's equations; static and quasi-static fields; conduction processes; network theory; basic elements and their properties; linearity, passivity, time-invariance, reciprocity; Kirchhoff's current and voltage laws; development of loop, node and state equations; solution techniques for linear and non-linear and/or time-varying networks, processing of analog and digital signals; digital logic circuits; functional requirements of networks; two and three-terminal elements in networks, coupled elements; electronics, transistor and tube amplifiers; distributed parameter networks, transmission lines, integrated-circuits; electromagnetic waves, waveguides, antennas, oscillators, detectors.

Prerequisite: ESG 121 Applied Mathematics I.

*Fall and Spring, 4 credits each semester*

### **ESG 263 Mechanics II: Mechanics of Solids**

An introduction to the mechanics of deformable solids used in engineering structures. Topics include: three-dimensional and two-dimensional descriptions of stress; principal stresses; coordinate transformations using Cartesian tensors; displacements and strain; elastic stress-strain-temperature relations; stress equations of motion; equations of elas-

ticity; 2-D compatibility equation; beam deformations due to bending and axial forces; statically indeterminate beams; elastic instability.

Prerequisite: ESG 161 Mechanics I.

*Fall, 3 credits*

### **ESG 264 Mechanics III: Mechanics of Fluids**

A physical introduction to the mechanics of fluids is presented and engineering applications are stressed. The concept of pressure is explored in the statics and uniform rotation of fluids. Physical laws of flow, the stream tube and control volume concepts are applied to internal and external force determinations in a perfect fluid. The effects of friction on flow rates and force distributions in an incompressible flow are studied. The thermodynamic and thermal effects of compressibility are introduced and shockwave phenomena are discussed.

Prerequisite: ESG 161 Mechanics I.

*Spring, 3 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 Engineering Design I.

*Spring, 4 credits*

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## **INTERDEPARTMENTAL ELECTIVE**

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### **ESI 310 Biomedical Engineering**

This course provides a systematic and basic development of the engineering principles applicable to medicine and biological systems. The subject matter will be developed 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 will be provided to bioastronautics, artificial organs, environmental control, man-machine systems and the stimulation of biological systems.

*3 credits*

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THE FOLLOWING REQUIRED COURSES  
WILL BE GIVEN FOR THE LAST TIME  
DURING 1969-70.

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### **ESG 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. The analysis 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 264 Mechanics III, ESG 202 Thermodynamics II.

*Spring, 3 credits*

### **ESG 323 Applied Analysis III: Numerical Methods**

Arithmetic of approximation; round-off error; significant figures. Polynomial approxi-

mation; interpolation and finite differences; least squares, orthogonal sets, Fourier-Bessel coefficients, Legendre polynomials, Fourier series; Tchebycheff approximation. Numerical solution of linear and non-linear systems of algebraic equations. Numerical differentiation. Numerical integration. Numerical solution of ordinary differential equations. Numerical solution of partial differential equations (Laplace's two-dimensional equation). The use of these techniques in solving lumped circuit and field concepts, quasi-static fields, interaction of fields with material media, motion of charged particles influenced by an electromagnetic field, relativistic transformations of field quantities, plane waves and radiation.

Prerequisites: PHY 151, ESG 222 Applied Mathematics II.

*Fall, 3 credits*

### **ESG 334 Materials Science III: Phase Transformation and the Mechanical Properties of Materials**

This course builds on the concepts presented in Materials Science I. Mechanisms of diffusion and phase transformations in solids and their relation to structure are studied. Oxidation and corrosion phenomena and the principles of oxidation and corrosion resistant materials are delineated. Attention is next turned to the mechanical properties of materials, considering the elasticity of crystals; anelasticity, plasticity and dislocation theory; cohesive strength and fracture processes in solids. Strengthening mechanisms in solids are then studied with application to metals, ceramics and polymers.

Prerequisite: ESG 232 Materials Science I.

*Fall, 3 credits*

### **ESG 353 Electrical Sciences III: Electromagnetic Theory**

The fundamentals of electromagnetic theory. The topics include: elements of vector analysis, Maxwell's equations, relation between linear and non-linear differential equations. Use of the computer in applying these numerical techniques.

Prerequisite: ESG 222 Applied Mathematics II.

*Spring, 3 credits*

## DEPARTMENT OF APPLIED ANALYSIS

*Professors:* \*DANIEL DICKER, VACLAV J. DOLEZAL, AARON FINERMAN, HERBERT L. GELERENTER, IRVING GERST (*Chairman*), REGINALD P. TEWARSON, AR-  
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*Assistant Professors:* ROY D. JOSEPH, WOO JONG KIM

*Instructor:* F. JOANNE HELTON

*Lecturers:* REX G. FRANCIOTTI, HERBERT H. HOPF

### ESA 165 Elements of Digital Computers

This course is similar to ESG 162, but with applications appropriate to the social sciences and humanities. For social science and humanities majors only. Two lecture hours, one laboratory hour.

Prerequisites: Sophomore standing and MAT 103 or permission of instructor.

*Fall and Spring, 3 credits each semester*

### ESA 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: ESG 222 Applied Mathematics II.

*3 credits*

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## DEPARTMENTAL ELECTIVES

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### ESA 301 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 engineering courses and that he obtain the agreement of a faculty member to supervise the research. Only three credits of research electives (ESA 301, ESE 301, ESM 301, ESC 301) may be counted towards fulfillment of technical elective requirements.

*Fall and Spring, 3 credits, repetitive*

### ESA 317 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 nonoscillation theorems; asymptotic behavior of linear systems; nonlinear autonomous systems; focal, nodal and saddle points; cycles; stability; Lyapunov functions; the van der Pol, Liénard and Duffing equations; approximate solutions.

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\* On leave academic year 1969-70.



Prerequisite: ESG 121 Applied Mathematics I or MAT 156.

*3 credits*

### **ESA 320 Introduction to Applied Probability Theory**

Elements of combinatorial analysis. Random variables and expectations. Laws of large numbers. The central limit theorem and its applications. Recurrent events and Markov chains. Applications to information theory, methods of coding, queueing problems, the-

ory of games, problems of strategy, decision-making, etc.

Prerequisite: MAT 102.

*3 credits*

### **ESA 321 Introduction to Applied Statistics**

Basic statistical concepts. Probability. Distribution functions and moment generating functions. Frequency distributions. Central limit theorem. Sampling. Regression and correlation. Analysis of variance. Testing of hy-

potheses. Applications to interpretation of engineering and industrial data by means of statistical methods, curve fitting, methods of quality control and preparation and use of control charts, reliability, various experimental designs, estimation of response relationships, determination of optimum conditions. Prerequisite: MAT 102.

*3 credits*

### **ESA 325 Mathematics in the Social and Behavioral Sciences**

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, graph theory and optimization).

*Spring, 3 credits*

### **ESA 326 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. Prerequisite: MAT 156 or ESG 121 Applied Mathematics I.

*Fall, 3 credits*

### **ESA 330 Linear 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 computer. Prerequisites: ESG 162 Introduction to Computing Science, ESG 121 Applied Mathematics I.

*3 credits*

### **ESA 335 Computer Organization and Programming**

Logical basis of computer structure, machine representation of number and characters, flow

of control, instruction codes, arithmetic and logical operations, indexing and indirect addressing, input-output, subroutines, linkages, macros, interpretive and assembly systems, pushdown stacks and recent advances in computer organization. Several computer projects to illustrate basic concepts will be incorporated.

Prerequisite: ESG 162 Introduction to Computing Science.

*3 credits*

### **ESA 340 Introduction to the Theory and Applications of Computers**

Topics covered include: introduction to the notions of effective calculability and computability, Turing machines, representation of information in a digital computer, axiomatic development of Boolean algebra, digital computer organization and logic, computer storage, control and input-output devices, online data acquisition systems, information display devices, image scanning and processing systems, very large read-only memories and information retrieval. Appropriate problems in engineering, physics, chemistry and biology will be discussed and analyzed.

Prerequisite: ESA 335 Computer Organization and Programming.

*3 credits*

### **ESA 342 Introductory Network Synthesis**

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.

Prerequisites: ESG 222 Applied Mathematics II, ESG 252 Electrical Sciences II.

*3 credits*

## DEPARTMENT OF ELECTRICAL SCIENCES

*Professors:* \*SHELDON S. L. CHANG, KUEI CHUANG (*Visiting*), RICHARD B. KIEBURTZ, VELIO A. MARSOCCI (*Acting Chairman*), GEORGE W. STROKE

*Associate Professors:* CHI-TSONG CHEN, PETER M. DOLLARD, DAVID R. SMITH, DEFOREST L. TRAUTMAN, HANG-SHENG TUAN

*Assistant Professors:* T. OWEN CARROLL, STEPHEN S. RAPPAPORT, GARY L. THOMAS

*Instructor:* PATRICK E. BARRY

*Lecturer:* KENNETH L. SHORT

### DEPARTMENTAL ELECTIVES

#### ESE 301 Research in Electrical Sciences

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 engineering courses and that he obtain the agreement of a faculty member to supervise the research. Only three credits of research electives (ESA 301, ESE 301, ESM 301, ESC 301) may be counted towards fulfillment of technical elective requirements.

*Fall and Spring, 3 credits, repetitive*

#### 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 Electrical Sciences I. *3 credits*

#### ESE 315 Introduction to Feedback Control Theory

The study of automatic control theory is initiated in this course. Primarily concerned with the analysis of linear feedback systems, the course deals with the transient response

and stability of such systems. The techniques employed are the transfer function method and various methods of graphical analysis such as Nyquist diagrams, Bode plots and root locus procedure. The synthesis of feedback control systems is covered in an introductory manner.

Prerequisites: ESG 101 Thermodynamics I, ESG 252 Electrical Sciences II, ESG 161 Mechanics I.

*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 Electrical Sciences II. *3 credits*

#### ESE 317 Digital Logic and Systems

Switching algebra and its relation to logic and the algebra of sets. Analysis and synthesis of combinational networks, including multiple outputs, symmetric functions and functional decomposition. Minimization techniques. Analysis, synthesis and minimization of sequential networks. Counting devices, arithmetic units and algorithms. Simple codes.

*3 credits*

\* On leave academic year 1969-70.



### **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 waveguides, basic antenna theory, low-noise antennas, introduction to statistical electromagnetic theory, data-processing antenna arrays, radio astronomy antennas.

*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 Electrical Sciences II.

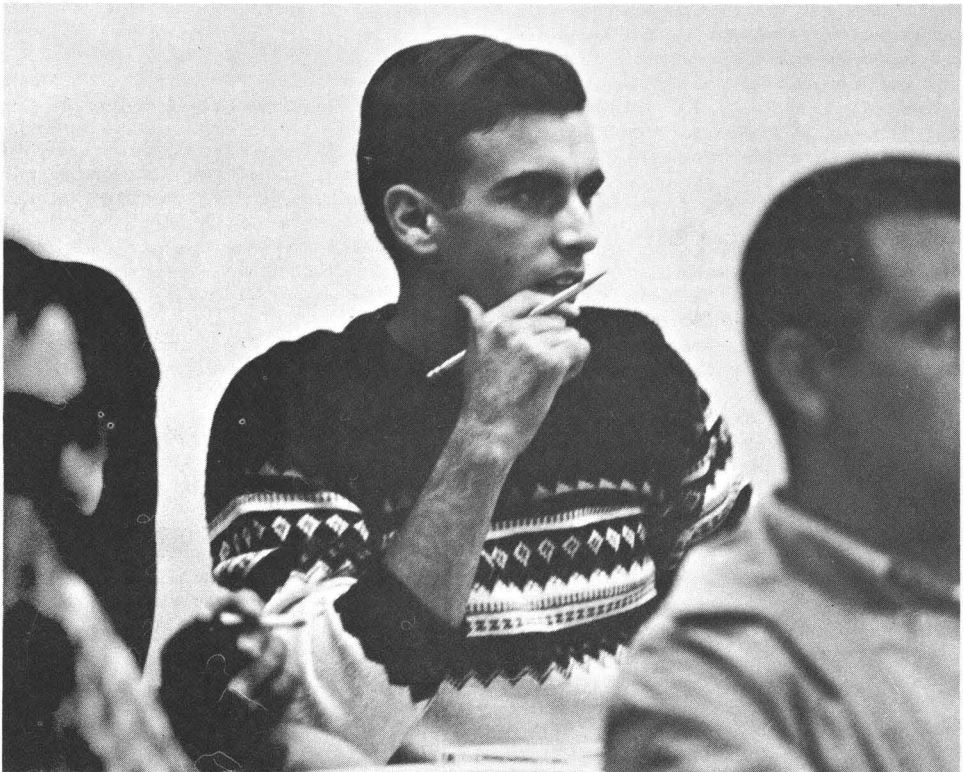
*3 credits*

### **ESE 340 Basic Communication Theory**

Signals, spectra and linear networks, elements of probability theory, random signals and noise, filtering, narrowband signals, amplitude modulation schemes, angle modulation schemes, comparison of modulation systems, sampling theory and pulse code modulation.

Prerequisites: ESG 222 Applied Mathematics II, ESG 252 Electrical Sciences II.

*3 credits*



## DEPARTMENT OF MATERIALS SCIENCE

*Professors:* FRANCO P. JONA, \*SUMNER N. LEVINE, ROBERT NATHANS, LESLIE L. SEIGLE, ROBB M. THOMPSON (*Chairman*)

*Associate Professors:* HERBERT R. CARLETON, HERBERT HERMAN, \*\*JOSEPH JACH, RICHARD W. SIEGEL, FRANKLIN F. Y. WANG

*Assistant Professor:* JOHN C. BILELLO

### DEPARTMENTAL ELECTIVES

#### ESM 301 Research in Materials Science

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 engineering courses and that he obtain the agreement of a faculty member to supervise the research. Only three credits of research electives (ESA 301, ESE 301, ESM 301, ESC 301) may be counted towards fulfillment of technical elective requirements.

*Fall and Spring, 3 credits, repetitive*

#### ESM 302 Techniques of Materials Science

A survey of the important experimental methods employed in studies of materials. This is essentially a laboratory course where the student will carry out refined measurements using research grade equipment. The areas to be covered include electrical and magnetic measurements, thermal properties and calorimetry, X-ray diffraction studies of crystalline and amorphous materials, optical and electron microscopic examination of materials and the mechanical properties of materials.

Prerequisites: ESG 232 and 233 Materials Science I and II.

*3 credits*

#### ESM 304 Materials Design by Structure and Purity Control

The basic concepts of materials science can be used to modify existing materials or to produce new materials in order to satisfy a broad range of design criteria. In most engineering applications it is usually necessary for a material to have the optimum value of several physical properties. As examples consider the following: a semiconductor used in certain transducer applications would require specified electronic and mechanical properties; also a steel used in a pressure vessel must meet specified mechanical and chemical (corrosion) properties, etc. The aim of this course is to combine theory and practice to show how control of the structure and purity of materials can be utilized to produce metals, semiconductors, glasses, ceramics and polymers which fulfill predetermined design goals. Lectures and demonstrations will be integrated so that it will be possible to obtain practical experience in applying theory to the actual control of physical properties of materials. Topics to be covered will include: crystal growth, doping and diffusion in metals and semiconductors, texture and recrystallization, magnetic domain structures, age-hardening systems, solid state phase transformations, composites and structure and purity control in polymers and glasses.

Prerequisites: ESG 232 and 233 Materials Science I and II.

*Spring, 3 credits*

\* On leave Fall semester 1969.

\*\* On leave academic year 1969-70.

### 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 Materials Science I.  
*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.

*3 credits*

### ESM 335 Introduction to Polymers

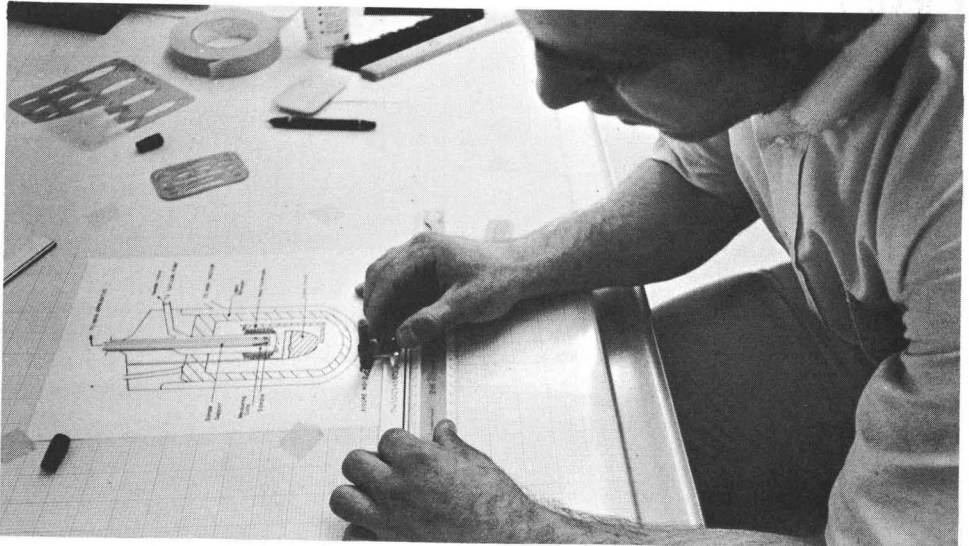
The objective of this course is to provide an introductory survey of the physics, chemistry and technology of polymers. The topics to be covered include classification of polymers, molecular forces and bonds, structure of polymers, measurement of molecular weight and size, rheology and mechanical properties, thermodynamics of crystallization, polymerization mechanisms, commercial polymer production and processing.

Prerequisite: ESG 232 Materials Science I.  
*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, semiconductors and ionic crystals. Topics include dielectric and magnetic properties, electrical and thermal conductivity and the interpretation of resonance techniques.

Prerequisite: ESG 233 Materials Science II.  
*3 credits*



## DEPARTMENT OF MECHANICS

*Professors:* ABRAHAM L. BERLAD, WALTER S. BRADFIELD, ROBERT D. CESS, THOMAS F. IRVINE, JR., RICHARD SHAO-LIN LEE (*Chairman*), EDWARD E. O'BRIEN, CHING H. YANG

*Associate Professors:* STEWART M. HARRIS, GEORGE R. STELL, JAMES TASI

*Assistant Professors:* RENE CHEVRAY, FU-PEN CHIANG, PRASAD VARANASI, LIN-SHU WANG

Students who intend to follow either one of the standard sequences of electives in mechanics or an improvised sequence are urged to consult the instructor listed with each course.

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### DEPARTMENTAL ELECTIVES

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#### ESC 301 Research in Mechanics

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 engineering courses and that he obtain the agreement of a faculty member to supervise the research. Only three credits of research electives (ESA 301, ESE 301, ESM 301, ESC 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/fail)*

#### ESC 311 Wave Theory

A more detailed consideration of the theory and application of the wave equation than is given in the introductory physics course. In addition to an exposition of the general consequences of the wave equation, special consideration is given to applications in the areas of optics and acoustics, and, to a lesser extent, electromagnetic waves. Emphasis is directed toward establishing a close connection between the mathematical formulation and the associated physical ideas.

Mr. S. Harris

Prerequisite: ESC 222 Applied Mathematics II.

*Fall, 3 credits*

#### ESC 322 Reactive Media

Lectures designed to provide the student with an introduction to the rate processes, flow and stability of reactive media. Fundamentals of theory and experiment for combustion, condensation, crystallization and other phase transition and transport phenomena. Energy transfer processes and molecular states. Onset and properties of laser action. Determination of thermokinetic rates from experiment. Applications to modern systems.

Mr. A. Berlad

*Fall, 3 credits*

#### ESC 323 Combustion

Lectures and laboratory work designed as an introduction to the fundamentals of combus-

tion processes. Combustion theory. Experimental properties of the ignition, quenching, propagation and stability of flames. Explosions and detonations. Combustion processes and air pollution. Radiative properties of flames. Dust explosions. Applications to modern systems.

Mr. A. Berlad

*Spring, 3 credits*

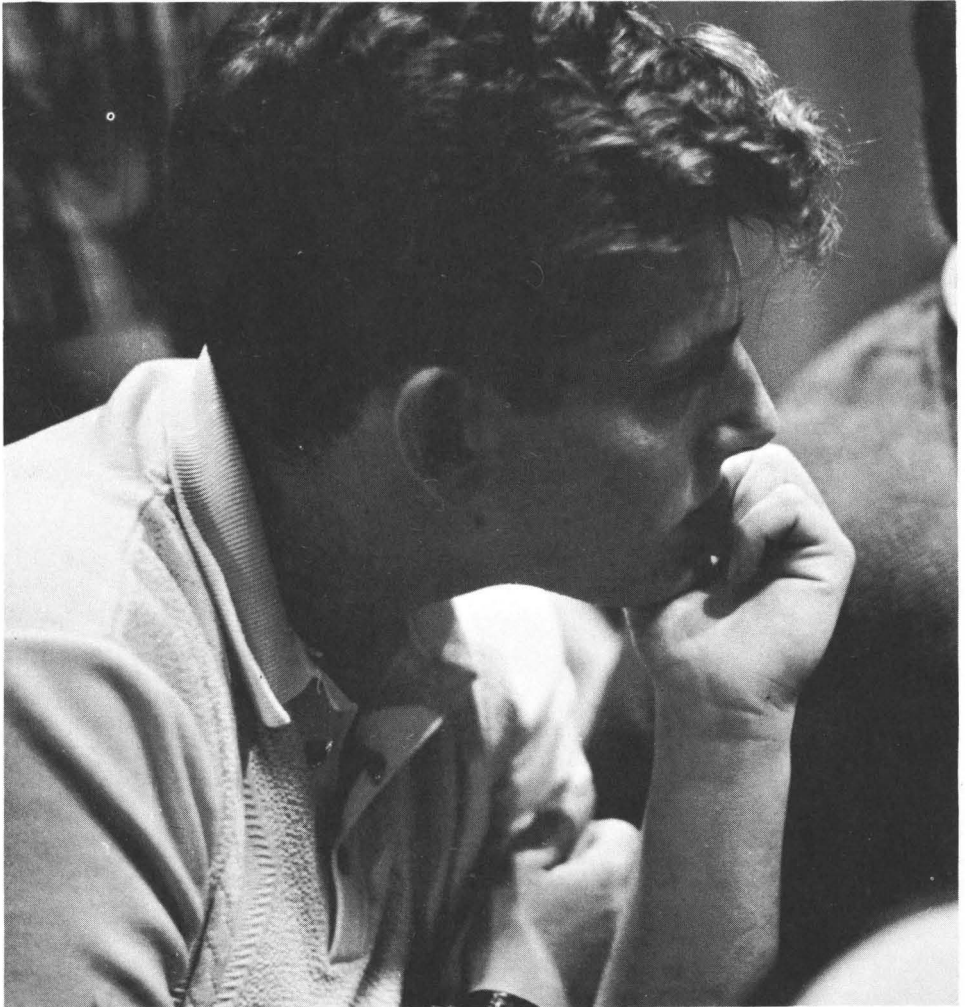
### **ESC 342 Introduction to Experimental Stress Analysis**

Elementary theory of elasticity, electrical and mechanical strain gauges, introduction to photoelasticity and moire method. Brittle coating and analog methods. Application of different methods to the study of static and dynamic problems.

Mr. F. Chiang

Prerequisite: ESG 263 Mechanics II.

*Spring, 3 credits*



### ESC 361 Applied Aero-and-Hydraulics

The study of applications of fluid dynamics theory to practical devices is undertaken in this course. Both internal flow and external flow are considered. Elements of subsonic and supersonic airfoil design are discussed. The effects of boundary layer growth on design and performance are studied. The stability of hydrodynamics systems is introduced.

Mr. W. Bradfield

Prerequisite: ESG 264 Mechanics III.

*Spring, 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.

Mr. E. O'Brien

Prerequisite: ESG 264 Mechanics III.

*Fall, 3 credits*

### ESC 379 Compressible Gasdynamics

One-dimensional gasdynamics 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 gaskinetics.

Mr. R. Cess

Prerequisites: ESG 101 Thermodynamics I and ESG 264 Mechanics III.

*Spring, 3 credits*

### ESC 381 Analysis of Structures

The mechanical behavior of engineering structures is studied by choosing topics from

the quasi-static and dynamic response of elastic and inelastic beams, bars, columns and shells subjected to mechanical and thermal loading.

Mr. J. Tasi

Prerequisite: ESG 263 Mechanics II.

*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) will be examined in some detail to illustrate the use of the general methods developed.

Mr. G. Stell

Prerequisites: ESG 202 Thermodynamics II and permission of instructor.

*Spring, 3 credits*

### ESC 395 Magnetofluid Dynamics

An integration of the concepts of fluid mechanics and electromagnetic theory. The interactions between an electrically conducting fluid and an applied electromagnetic field are studied, and the ramifications of these with respect to engineering applications such as power production, thermo-nuclear confinement, flow control, drag reduction and signal distortion are considered. Special consideration is given to the study of plasmas and magnetohydrodynamics.

Mr. S. Harris

Prerequisites: ESG 252 Electrical Sciences II and ESG 263 Mechanics III.

*Spring, 3 credits*

### ESC 398 Advanced Thermodynamics

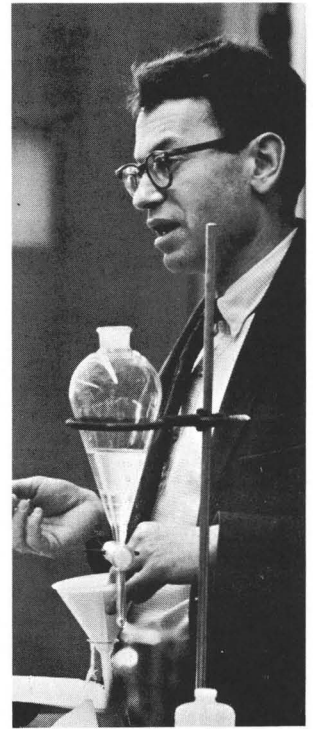
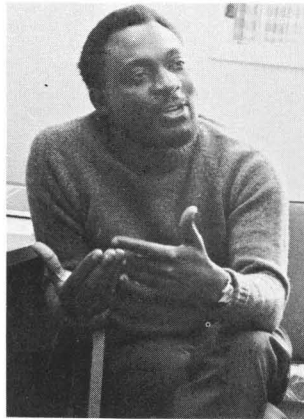
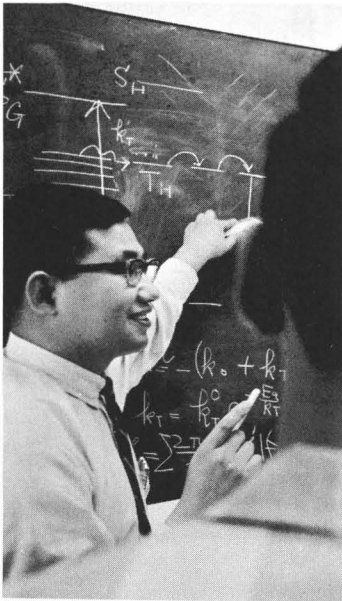
An introduction to the principles and applications of thermodynamics for systems involving intensive variables besides temperature and pressure. Stability and phase transitions. Onsager's reciprocal relations and its applications.

Mr. L-S. Wang

Prerequisite: ESG 101 Thermodynamics I.

*Fall, 3 credits*

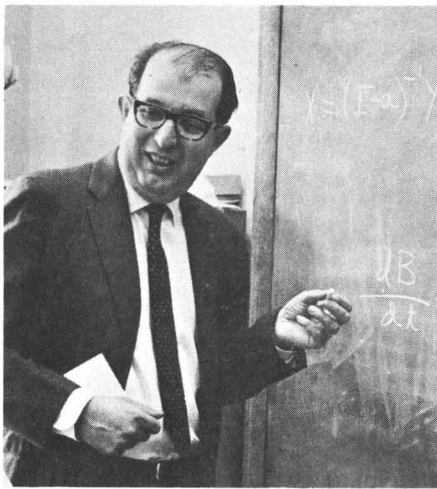
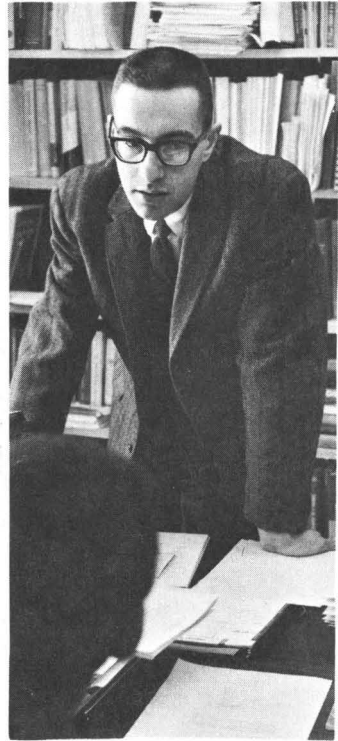
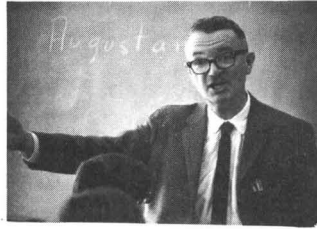






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	Campuses



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fornia, San Diego
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M.A., Oxford University; Ph.D., University of Munich
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## STATE UNIVERSITY OF NEW YORK AT STONY BROOK MEMBERS OF THE STAFF

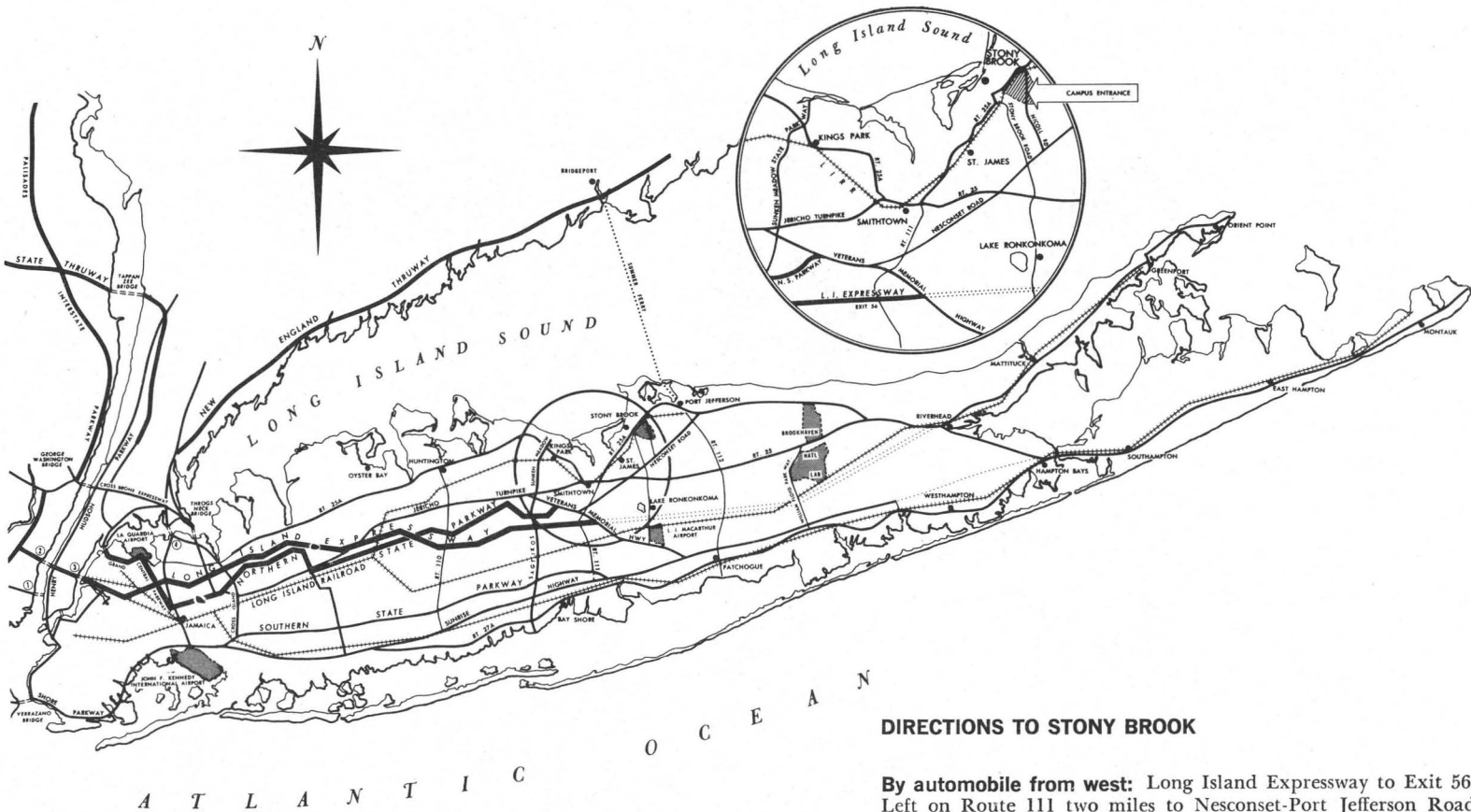
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*Assistant Director, University Relations*
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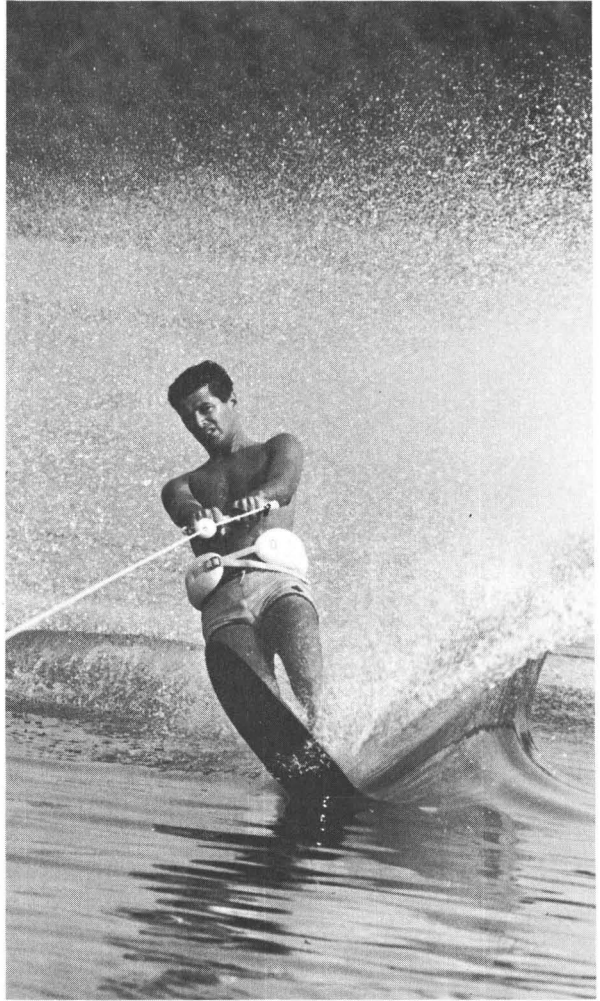
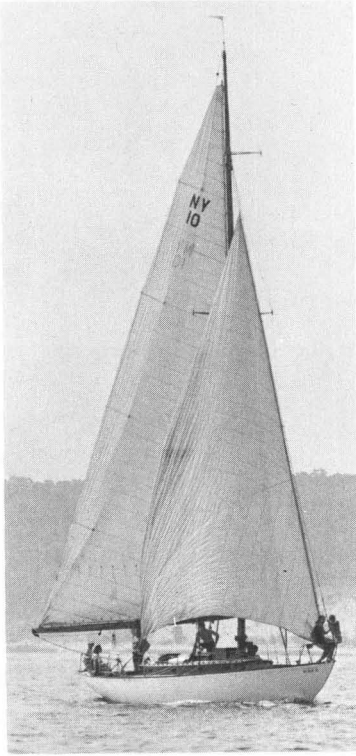


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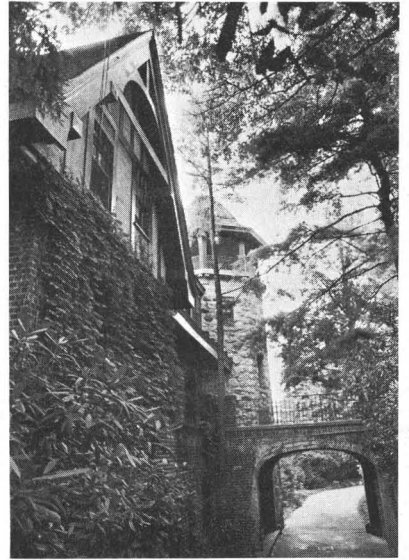
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**By automobile from east:** Nesconset Road or Route 25A to Nicoll Road. Right or left, respectively, to campus entrance.

**By Long Island Railroad:** Take Port Jefferson line from Pennsylvania Station (Manhattan) or Flatbush Avenue Station (Brooklyn). Change at Jamaica for remainder of trip to Stony Brook Station.

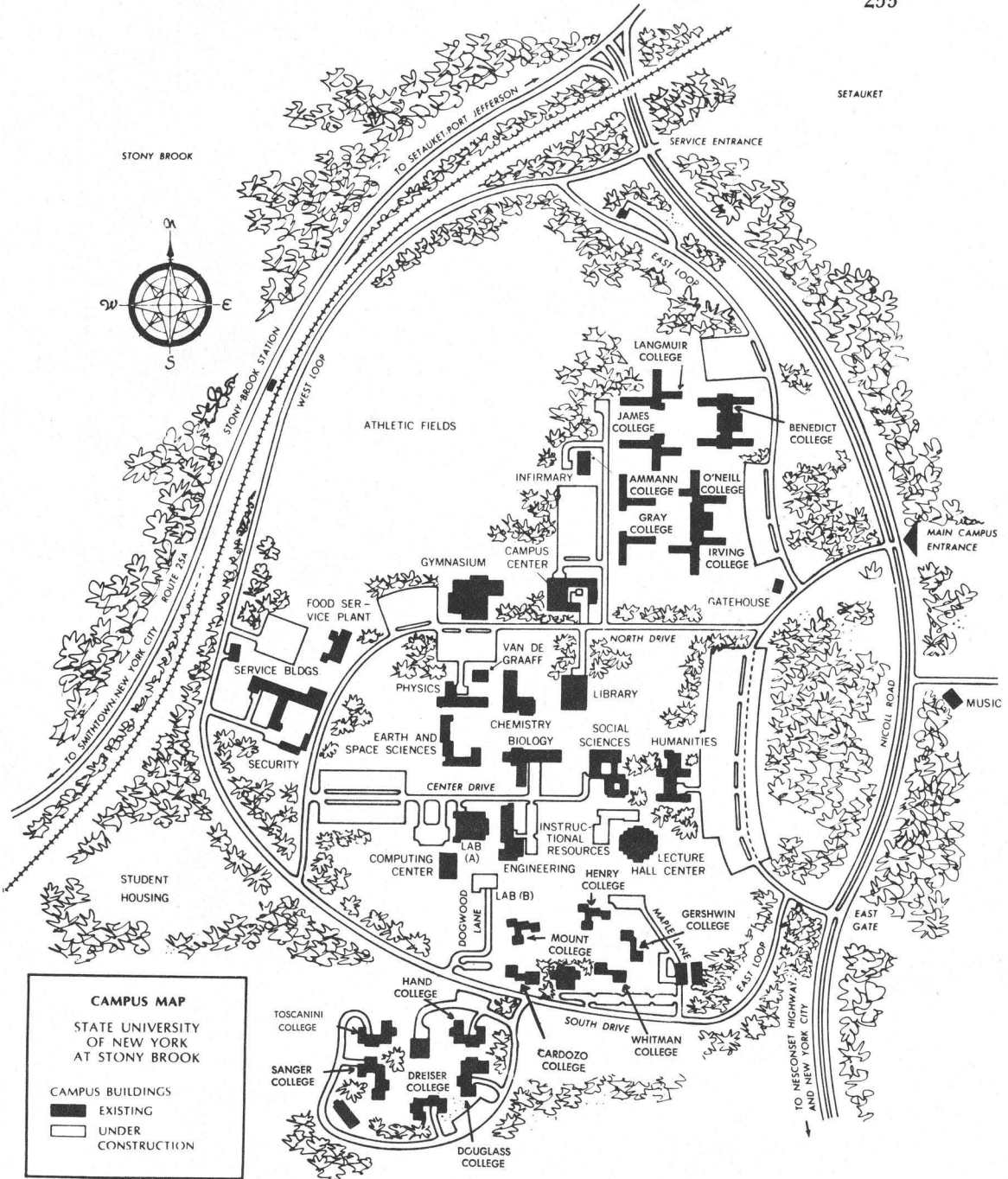
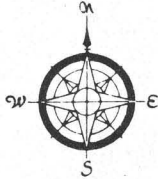






SETAUKET

STONY BROOK



**CAMPUS MAP**  
 STATE UNIVERSITY  
 OF NEW YORK  
 AT STONY BROOK

CAMPUS BUILDINGS

- EXISTING
- UNDER CONSTRUCTION

## STATE UNIVERSITY OF NEW YORK GENERAL DESCRIPTION

State University of New York, established by the State Legislature in 1948, comprises 70 colleges and centers. At present, 63 conduct classes: four university centers, two medical centers, 11 colleges of arts and science, two specialized colleges, six two-year agricultural and technical colleges, five statutory colleges and 33 locally-sponsored, two-year community colleges.

Two colleges of arts and science are in varying stages of development. Two four-year campuses, in Westchester County at Purchase and in Nassau County at Old Westbury are under construction. Old Westbury admitted a limited number of students in September 1968, in temporary quarters at Oyster Bay, Long Island. The third campus will be upper-divisional (junior-senior years) in concept and located in the Utica-Rome-Herkimer area. Masters level programs will be offered at all three campuses.

The University's trustees also have approved the establishment of five additional community colleges. In varying stages of development, they are sponsored by Clinton, Columbia-Greene, and Schenectady Counties and two by New York City's Board of Higher Education.

The University further comprises the Ranger School, a division of the College of Forestry, which offers a 43-week technical forestry program at Wanakena; the Center for International Studies and World Affairs at Albany; and four urban centers administered by community colleges.

University-wide research programs include the Atmospheric Sciences Research Center with campus headquarters at Albany, the Institute for Theoretical Physics and the Marine Sciences Research Center at Stony Brook, and the Water Resources and Polymer Research Centers at the College of Forestry. Two research facilities headquartered at State University of New York at Buffalo are the Western New York Nuclear Research Center and the Center for Immunology.

Graduate study at the doctoral level is offered by State University at 12 of its campuses, and graduate work at the masters level at 22. The University is continuing to broaden and expand over-all opportunities for advance degree study.

Graduate study areas embrace a wide spectrum including agriculture, business administration, criminal justice, dentistry, education, engineering, forestry, law, liberal arts and science, library science, medicine, nursing, pharmacy, social work and veterinary medicine.

Four-year programs strongly emphasize the liberal arts and science and also include specializations in teacher education, business, radio and television, forestry, maritime service, ceramics, pre-law, and the fine and performing arts.

Two-year programs include nursing and liberal arts transfer programs and a wide variety of technical curriculums such as agriculture, business, and the industrial and medical technologies.

The University's urban centers provide training for skilled and semi-skilled occupations and college foundation courses for youths in the inner city areas.

Governed by a board of trustees appointed by the Governor, State University of New York comprises all State-supported institutions of higher education, with the exception of the senior colleges of City University of New York. Each college and center of State University is locally administered. Although separated geographically, all are united in the purpose of improving and extending numerous opportunities to the youth of New York State.

The State University motto is: "Let Each Become All He Is Capable of Being."

## STATE UNIVERSITY OF NEW YORK

Office of the Chancellor  
8 Thurlow Terrace, Albany, N.Y. 12201

### 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 SCIENCES

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

### SPECIALIZED COLLEGES

College of Forestry at Syracuse University  
Maritime College at Fort Schuyler (Bronx)

### AGRICULTURAL AND TECHNICAL

#### COLLEGES (Two-year)

Alfred	Cobleskill	Farmingdale
Canton	Delhi	Morrisville

### STATUTORY COLLEGES

College of Ceramics at Alfred University  
College of Agriculture at Cornell University  
College of Home Economics at Cornell  
School of Industrial and Labor Relations at Cornell  
Veterinary College at Cornell University

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\*(Three additional Colleges of Arts and Science are in varying stages of development. Two four-year campuses, in Westchester County at Purchase and in Nassau County at Old Westbury are under construction. Old Westbury admitted its first students in limited numbers at temporary quarters in Oyster Bay in September, 1968. The third campus will be upper-division (junior-senior years) in concept and located in the Utica-Rome-Herkimer area. Master's level programs will be offered at all three campuses.)

### 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 at Binghamton  
Broome Technical Community College  
Community College of the Finger Lakes  
at Canandaigua  
Corning Community College at Corning  
Dutchess Community College  
at Poughkeepsie  
Erie County Technical Institute 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  
Hudson Valley Community College at Troy  
Jamestown Community College  
at Jamestown  
Jefferson Community College at Watertown  
Kingsborough Community College  
Mohawk Valley Community College  
at Utica  
Monroe Community College at Rochester  
Nassau Community College at Garden City  
New York City Community College  
of Applied Arts and Sciences  
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  
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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(Five additional community colleges have been approved by the Board of Trustees and are in varying stages of development. They are sponsored by Clinton, Columbia-Greene and Schenectady Counties and two by the New York City Board of Higher Education.)

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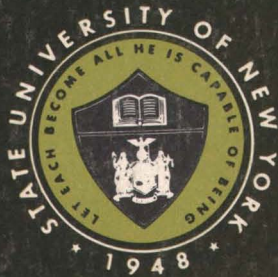
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