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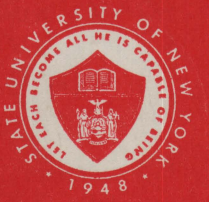

State University of New York

at Stony Brook

The Undergraduate Bulletin

1965-1966

State University of New York

THE STATE UNIVERSITY OF NEW YORK was established by the State Legislature in 1948. It comprises 58 units: four university centers, two medical centers, ten colleges of arts and science, eight specialized colleges, six two-year agricultural and technical colleges, and 28 locally-sponsored two-year community colleges. Although separated geographically, all are united in the purpose to improve and extend opportunities for youth to continue their education beyond high school.

State University offers programs in the liberal arts and sciences; engineering; home economics; industrial and labor relations; veterinary medicine; ceramics; agriculture; forestry; maritime service; teacher education; law; pharmacy; medicine; dentistry; social work; business administration; public administration; and librarianship. The University's two-year programs also include liberal arts study and a wide variety of technical courses in such areas as agriculture, business and the industrial and medical technologies.

Advanced graduate study at the doctoral level is offered by the University at 13 of its units, including the university centers and the Graduate School of Public Affairs. While graduate work can be pursued at 24 of the colleges, the programs at the majority of these units are now limited to the master's level. The University, however, is continuing to broaden and expand overall opportunities for advanced degree study.

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 four-year colleges of City University of New York. Each college and center of State University is locally administered. Students should write directly to the institution in which they are interested for admission forms.

The State University motto is: *"Let Each Become All He Is Capable of Being."*

STATE UNIVERSITY OF NEW YORK AT STONY BROOK

College of Arts and Sciences
College of Engineering

The Undergraduate Bulletin

1965-1966

Photographs by LESTER LEFKOWITZ

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Academic Calendar
1965-1966

Fall Semester 1965

Freshmen Orientation	September 16–17
Registration	September 20–21
Classes Begin	September 22
Thanksgiving Holiday	November 25–28
Classes Resume	November 29
Christmas Holiday	December 19–January 2
Classes Resume	January 3
Last Day of Classes	January 15
Semester Examinations	January 17–27

Spring Semester 1966

Registration	February 7–8
Classes Begin	February 9
Spring Recess	April 3–10
Classes Resume	April 11
Last Day of Classes	May 21
Semester Examinations	May 23–June 2
Commencement	June 5

Summer Session 1965

Registration	June 28
Classes Begin	June 29
Last Day of Classes	August 6

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** On leave Fall Semester 1965
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A Challenge and an Opportunity

Today our national need is broadly educated leadership — the talents of America's sons and daughters brought to the highest level of capacity in every field of endeavor. This need is growing each decade with the increasing technical and social complexity of our institutions. Only those who understand these institutions and have the capacity and the will to work through them will keep them free.

Universities train intelligence, kindle imagination, and inculcate wisdom. Their primary responsibility is to develop human intelligence and orient it culturally, that it may make its fullest contribution and achieve its greatest significance in the solution of human problems. Pressing contemporary needs and the thousand-year-old University tradition thus converge to give central importance to education today.

As a public institution in this tradition and meeting this need, State University of New York at Stony Brook offers exciting opportunities to qualified students. It gives these selected young people a chance to respond to the challenge and stimulus of learning, expecting they will find the reward for the development of their talents in the added contributions they can make to their fellow men.

The University at Stony Brook

The State University of New York at Stony Brook provides excellent educational opportunities at relatively low cost. It combines the traditional functions of teaching and the conservation of knowledge with the discovery of new knowledge through research and other creative activity.

The University is located in the Stony Brook-Setauket area, a region of woods and hills and small historic villages on the North Shore of Long Island, about 60 miles northeast of New York City. The 640-acre campus is linked with Manhattan by a pattern of four- and six-lane highways and by the Long Island Railroad (see maps at back of bulletin).

Two undergraduate colleges and the Graduate School presently comprise the State University at Stony Brook. The *College of Arts and Sciences* with 16 departments offers Bachelor of Arts and Bachelor of Science degrees and programs of concentration in 21 subjects. The *College of Engineering* with four departments grants the Bachelor of Engineering degree. The *Graduate School* awards Master of Arts or Master of Science and Doctor of Philosophy degrees in biological sciences, chemistry, engineering, history, mathematics and physics and the Master of Arts in English. Eventually all departments of the two Colleges will present programs leading to the doctorate.

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 Department of Chemistry is accredited by the American Chemical Society.

History and Growth

The University was founded in 1957 at Oyster Bay and moved to its present location in 1962. Enrollment, which totaled 145 students eight years ago, will approximate 2,700 in the 1965-66 academic year. This is expected to increase threefold by 1970.

To handle the increasing educational responsibilities, the faculty is growing rapidly in number. As of the fall of 1965, Stony

Brook will have over 250 faculty members, many of them acknowledged leaders in their fields. A complete list of faculty members can be found in the front pages of this bulletin. Their present distinction is only partially revealed in the listing of degrees earned and the institutions that have awarded them.

The Stony Brook Campus

Increasing enrollment is one indicator of dynamic growth. Another is campus expansion. Many fine buildings are already in full operation on the rolling, wooded Stony Brook campus. Others are under construction or planned in a total building program amounting to $85 million.

Among the 13 buildings now in use are five which provide classroom, laboratory and office space for the divisions, schools or departments they serve. These include separate buildings for the *Humanities* (which has space for the departments of English, Fine Arts, Foreign Languages, Philosophy, Anthropology, Economics, Education, History, Political Science, Psychology, and Sociology); the *Chemistry* department; the *Biology* department; and the *College of Engineering.* The *Physical Laboratory* building houses the offices of the Graduate School and the departments of *Physics, Mathematics,* and *Earth and Space Sciences.*

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 (see separate section on libraries).

Six two-story brick *residence halls* afford living quarters for 2,000 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 Playhouse theater.

A host of new facilities will be constructed over the next two years. Prominent among them will be a *Fine Arts Center,* with buildings for music, art and theater; a *Lecture Hall Center;* a *Social Science* building and an *Earth and Space Sciences* building; a *Campus Center,* with extensive dining facilities, an auditorium, meeting rooms for students and recreational facilities; and an *Instructional Resources Center* for television and film studios that will be part of

a state-wide educational television network. Other structures will include additional facilities for the College of Engineering and the Computing Center; a semi-underground extension of the Physics building to house the new Van de Graaff nuclear accelerator; and a building for the Center for Marine Sciences. The system of residence halls will be continuously enlarged as needs increase.

Students who come to Stony Brook will find both an opportunity and a challenge, for the University's confidence in its future does not rest simply on costly facilities and a growing enrollment. Past progress has been qualitative as well as quantitative, and the faculty and administration are continuously pushing toward goals of institutional greatness as manifested in the highest levels of scholarship and professional attainment.

Libraries

The Frank Melville, Jr. Memorial Library, a three-story air-conditioned structure, occupies the highest point on the campus. It is the focal point of the site plan, located at one end of the central mall. The attractive contemporary building is designed for 350,000 volumes and will seat 700 students. Other libraries on campus are the technical and scientific collections housed in the science buildings and in the College of Engineering, all centrally administered from the main library.

In all campus libraries users have free access to books in the open bookstacks with reading areas and bookstacks integrated throughout and no barriers separating the two. In the Melville Library, seminar rooms are provided on the first floor and soundproof typing rooms on the second and third floors. There is a special room for the housing and use of microform equipment, including reading machines for microfilm, microcards, microprint, and microfiche. A microprint reader-printer is also housed in this room. A photocopy machine is available for the purpose of copying pages from magazines and reference books.

The university library is a selective government depository and receives large numbers of publications issued by the U.S. government. About 2,000 periodicals are currently received covering all areas of knowledge, and the staff is processing books at the rate of more than 20,000 per year. The collection now numbers over 105,000 volumes.

The library furnishes students with recordings of music as well as records of speeches, poetry, and drama. The music library will occupy a portion of the first floor when the facilities are complete. The latest electronic equipment will be installed, including the use of tapes and cartridges operated by remote control under the direction of a music librarian and a skilled electronics engineer.

The plan of the building is based on the module so that its function will be flexible and changes can be made in the interior plan when desired. This building is intended as the first part of a large structure that will ultimately store a million volumes and will serve a student body of ten thousand. Until the completion of an administration building, the Melville Library will house the administrative and business offices on one half of the second floor.

The Computing Center

The Computing Center was established to serve the needs of the student body, faculty, and administrative officers in the field of electronic computers. The objectives of the Center are many. It not only introduces students to concepts of modern computing technology through course work and the integration of the computer-oriented approach in problem courses, but also makes the computing facilities freely available for such student activities as term papers, research projects, and theses.

The Center serves the faculty in both sponsored and unsponsored research activities and the administration in such areas as institutional research and administrative data processing. Short courses in programming and problem oriented languages are held periodically for faculty and administrative staff.

The Center's professional staff is available to assist faculty users in programming research applications and to maintain a library of widely used programs. University-wide administrative applications are written for computer processing by the Center's administrative programming staff.

The present equipment consists of an IBM 7040/1401 computing system (with 32,768 words of main storage in the 7040 computer),

11 magnetic tape units (one connected to a high speed automatic plotter) and associated peripheral equipment. Currently, the equipment is housed in two rooms in the basement of the Engineering Building. A Computing Center building with sufficient space for staff, equipment and program preparation by users is planned for occupancy by 1967.

Student Services and Activities

Advisory and Counseling Services

A faculty adviser is assigned to each student, who is encouraged to consult this adviser regarding educational planning and any academic problems arising during the school year. In addition, the Office of the Dean of Students consists of a staff of trained counselors experienced in helping students with personal, social, educational, and vocational problems. An orientation program is conducted for incoming undergraduates during a period immediately prior to their initial registration.

Placement and Financial Aid

Information on student employment, summer jobs, and assistance in securing full-time non-teaching positions is provided through the Office of the Dean of Students. This Office also administers financial aid programs and furnishes information regarding them. Information on teaching positions is available through the Department of Education. (Data on scholarships and loans will be found under Financial Information.)

Student Health Service

Minor medical care is provided in the infirmary through the services of a full-time registered nursing staff and the availability of a physician. The fuctions of this service do not include continuing medical care for chronic or congenital conditions. Students suffering from such conditions should make private arrangements for care by a physician of their choice. A health-insurance program has been adopted to cover the costs of treating major illness, including those of hospitalization and surgery. Any student whose illness in the opinion of the physician requires attention or treatment beyond that available at the University will be referred to his family or guardians for care at home or in a hospital, and by a physician of their choice.

Athletics

Intramural leagues have been organized in such sports as touch football, volleyball, basketball, tennis, and softball.

The intercollegiate program for men consists of seven sports: crew, cross-country, track, basketball, bowling, tennis, and soccer.

Student Organization

The Student Polity, to which all students belong, allows them to govern themselves to a large extent in extra-curricular matters. The Executive Committee of Polity, composed of elected members, aproves student organizations, and with the Student Activity Board, coordinates the social, cultural, and recreational student activities. Student publications include *The Statesman,* the newspaper; *Specula,* the yearbook; and *Soundings,* the literary magazine. The range of organizations will be suggested by the following: The Biological Society, the Chemistry Society, French Club, German Club, Chess Club and Cheerleading Squad, Jewish Students Organization, Newman Club, *Premedical-Predental Society, Student Christian Association. The Student Polity also sponsors art exhibits, concerts, lectures and films, and operates its radio station, WUSB.

Housing

Unmarried freshmen students who do not live at home during the school year are required to live in University residence halls. Upperclass students may, with the approval of the Director of Student Housing, live in private off-campus residences which meet standards set by the University.

In 1965–66 on-campus housing for 2000 students will be available. Rooms provide a bed, mattress, bureau, study desk and chair, and closet for each occupant. Lounges and public areas are interspersed through the residence halls.

The board purchased by resident students consists of 21 meals a week; nonresident students may purchase complete meals in the

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* The Premedical-Predental Society acquaints the student with information concerning the medical and dental professions. Students interested in preparing for medical or dental schools are advised to consult with the Premedical Advisory Board before selecting a major field of concentration.

University dining halls and also food in the snack bar. (For residence charges, see page 40.)

Life in the residence halls is organized under a system of student self-government. Full-time professional counselors are in residence.

Psychological Services

Psychological services are provided for students through the joint sponsorship of the Dean of Students and the Department of Psychology. These services include group psychotherapy, short-term individual psychotherapy and referral to outside agencies when longer term treatment is recommended. The psychological services are intended for students who have personal problems or who are experiencing considerable difficulty in adjusting to university life and its demands.

Admissions

Admission to Undergraduate Study

The State University of New York at Stony Brook is open to men and women who have demonstrated academic competence in their prior schooling.

An applicant is admitted after a careful analysis of data provided by high school or other scholastic records, standardized tests, and school recommendations. In many cases an interview will be held to assess his ability to perform the intellectual tasks required by the curriculum he has selected. Since a student may develop academic competence and intellectual qualities in various ways, both within and outside the context of formal instruction, no particular pattern of secondary school preparation with the exception of three years of mathematics is demanded, and no single criterion for admission based upon academic average or rank in class has been adopted. The degree requirements listed elsewhere in this Bulletin will enable a candidate to judge his own preparation in terms of the performance that will be expected of him at the University.

Final acceptance will depend in part upon receipt of an acceptable medical report.

No programs are offered at present for part-time students or non-degree candidates.

Application Procedure for New Freshman

An application for admission may be obtained by writing the Admissions Office, The State University of New York at Stony Brook, Stony Brook, New York.

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.

Personal interviews will be required of some but not all applicants. Candidates may themselves request interviews for purposes of information or clarification. Interviews are of greater usefulness

after the applicant's academic record has been filed in the Admissions Office.

Applications for the spring semester should be filed before January 1st.

Appointments for interviews may be made by mail or by telephone to the Admissions Office, Telephone 246-5126 (Area Code 516). *Appointments may be made between 10:00 a.m. and 4:00 p.m. Monday through Friday.*

Additional information may be obtained by writing to the Office of Admissions, The State University of New York at Stony Brook, Stony Brook, New York.

Advanced Standing

Advanced standing may be granted to transfer students who have completed acceptable courses in recognized institutions with a grade of C or its equivalent. Appropriate advanced standing will be given wherever possible.

Advanced Placement

Advanced placement may be extended to new freshmen who have completed advanced courses in secondary school or who have in other ways developed academic competencies which entitle them to special consideration. However, all students will be expected to complete the required credit hours. Candidates undertaking advanced placement courses in secondary school are expected to take the appropriate examinations and to request that their scores be forwarded to this institution. Others desiring advanced placement should submit a written request for a review of their qualifications. In most cases a special examination or examinations will be required.

Notification of Admission

Notices of admission to the State University of New York at Stony Brook normally are mailed during the month of April. In some cases earlier notification may be made. Some negative decisions may also be made prior to the usual notification period.

Acceptance is conditional upon the successful completion of academic work in progress. Acceptance is conditional upon the

successful completion of academic work in progress at a level commensurate with the work upon which acceptance is based.

A limited number of February admissions will be considered and notification will be mailed in the order of the receipt of applications.

Entrance Examination

Applicants for admission must take the entrance examination described in *How to Apply for Admission.* Candidates are urged to complete this requirement as early in the application process as possible.

Although the Scholastic Aptitude Test (SAT) of the College Entrance Examination Board is not required for admission, all applicants who sit for this examination are urged to have the results forwarded to the Admissions Office.

Candidates who reside out of state and are unable to take the regularly scheduled State University Entrance Examination may request permission to substitute the Scholastic Aptitude Test, the test of the American College Testing Program, or other recognized entrance examination. Such requests must be made in writing to the Director of Admissions at the earliest date possible.

Transfer Students

Any applicant who has been previously registered at a degree-granting institution must apply as a transfer student. Each transfer student, in addition to completing the application procedure outlined for new freshmen, must submit the following:

An official transcript of record from each collegiate institution attended. (If no grades were earned, a statement of attendance and honorable dismissal is required.)

A Course Evaluation Request (forms may be obtained from the Office of Admissions) for each course the applicant wishes considered for advanced standing.

Financial Information

Tuition and Fees

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

Charge or Fee	*First Semester*	*Second Semester*	*Year*
Tuition			
N.Y. State Resident	$200.00	$200.00	$400.00
Out-of-State Resident	300.00	300.00	600.00
State University Fee	12.50	12.50	25.00
Student Health Insurance Fee*	26.50		26.50
Student Activity Fee**	50.00		50.00
Identification Card	2.00		2.00
Damage Deposit	20.00		20.00
Telephone Deposit	15.00		15.00
Orientation (Freshmen Only)**	5.00		5.00
Graduation (Seniors only)	15.00		15.00

Room					
Double	*1st Qtr.*	*2nd Qtr.*	*1st Qtr.*	*2nd Qtr.*	*Total*
Occupancy	$ 91.25	$ 91.25	$ 91.25	$ 91.25	$365.00

* Student health insurance fee waived if proof of both hospital and medical insurance is presented prior to registration.

** Maximum that may be assessed.

(Any student occupying accommodations for the first time in the year must pay 1st quarter charges regardless of what quarter occupancy is taken)

Board

	1st Qtr.	*2nd Qtr.*	*1st Qtr.*	*2nd Qtr.*	*Total*
21 Meal Plan	$110.00	$110.00	$110.00	$110.00	$440.00

SUMMER SESSION 1965

Charge or Fee:

Tuition, New York State Resident	$ 13.50 per credit hour
Out-of-State Resident	$ 20.00 per credit hour
State University Fee	$ .85 per credit hour

Room:

Double Occupancy	$ 7.00 per week
Single Occupancy	$ 10.00 per week

Board:

15 Meal Plan	$105.00

A statement of all charges will be sent to the student at the beginning of the academic year, or upon his admittance. This 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 $15.00.

Two free transcripts will be provided each student who graduates; additional transcripts are available at a cost of $1.00 each.

The above fees are subject to change without notice.

Preadmission Deposit

Each new student is required to pay an advance deposit of $50.00. This deposit, payable upon tentative or conditional acceptance, is applied against charges incurred by the depositor at the start of his attendance. The deposit is required on or before April 30th for students notified of acceptance before April 1st. For those students notified of acceptance after April 1st, or for admission in

other than the Fall semester, deposits are payable within thirty days after acceptance or before registration, whichever is earlier. The deposit is refundable only in the case of those students who, having forwarded their deposits upon conditional acceptance, have later been refused admission.

New students who are remiss in paying this advance deposit may experience delay and difficulty in registering for classes.

Refunds

A student who withdraws after the first five days of a semester is entitled to only a partial refund of monies collected for tuition and fees. A schedule of refunds is available at the Business Office.

Withdrawal from a Meal Plan, with the approval of University officials, 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 above 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 $25.00 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. Arrangements are made between the student and the laundry service. Coin operated washing machines and dryers are available in the residence halls.

Each room is provided with a private telephone. A deposit of $15.00 (listed in the schedule) must be paid prior to taking up residence. Upon graduation or withdrawal from the University, this deposit will be refunded, less any charges outstanding.

Scholarships and Loans

Regents' College Scholarships are granted by New York State to high school graduates by counties on the basis of an annual written scholastic competition. Application should be made through the local high school principal.

Scholar Incentive Awards are available, for each semester of attendance, to anyone matriculated in a college in the State of New York in a full-time program leading to a degree, provided he has been a resident of New York State for the preceding year and meets the prescribed academic requirements. (An undergraduate who is a legal resident but has not been a resident for a full year may qualify for an award if he was a resident during his last year of high school. Similarly, a graduate student may qualify if he has been a resident from the beginning of his last year of college attendance until the time he matriculates for graduate study.)

The amount of the award will be based on the net taxable balance of the income of the student and of those responsible for his support, as this income is reported on the New York State Income Tax Return for the last calendar year. For married students, at the graduate and undergraduate level, this includes the spouse's income. If more than one child in the family is attending college, the net taxable balance is divided by the number of those attending college. The maximum amount to be awarded for each of the two semesters of an academic year is as follows:

Net Taxable Balance	Undergraduate Study	First Year Graduate or Professional Study	Graduate or Professional Study Beyond First Year
$1,800 or less	$150.	$200.	$400.
$1,801 to 7,500	100.	150.	300.
Over $7,501.	50.	100.	200.

Holders of the award and the University will receive, as soon as practicable, a notice of the maximum award to which the holder will be entitled solely on the basis of financial status. However, the amount of the award cannot exceed the amount by which the college tuition for the semester (not including fees) exceeds $100.00. Application for Scholar Incentive Awards should be made to the Regents Examination and Scholarship Center, State Education Department, Albany, New York.

A student may also be eligible to apply for a State University Scholarship of up to $200.00 each academic year. To qualify, each

applicant must be a resident of New York State, a full-time student, and have a net taxable family income of less than $1,800.00 as outlined above. In general, entering freshmen holding Regents College Scholarships are not eligible for State University Scholarships. Interested students may direct inquiries as to their eligibility to the Financial Aid Officer of the University.

Students are advised to have their Notices of Award with them when registering at the University. These will be received by students from the Regents Scholarship Center in Albany. Deferred payment arrangements can be made only when students have their notices.

Scholarships for Children of Deceased or Disabled Veterans are granted by New York State to eligible applicants on the basis of an annual scholarship examination. Application should be made through the local high school principal, or to the State Education Department, Albany, New York.

Veterans may attend the State University under the benefits of Public Law 894 (disability) or 550 (Korean War).

Eligible students may also receive financial assistance from the Division of Vocational Rehabilitation of the New York State Education Department.

Both the State of New York and the Federal Government offer low cost loan programs through the University to help students finance their higher education. Information on these loans and application forms may be obtained from the Financial Aid Officer.

A pamphlet entitled *Financial Aid Programs for Undergraduate Students* explains the above programs in greater detail. It may be obtained from the Financial Aid Officer of the Office of the Dean of Students.

It should be noted that student loan funds are limited and thus are not intended as a convenience but as an assistance to students whose families would not otherwise have the means to send their children through college.

When approved by the Business Officer of the University, scholarships held by State University students may be applied directly to such expenses as room, board, and fees, where a student has made a tuition payment and there are other outstanding balances due on his account.

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 private meeting with the Business Officer or his representative to agree on a deferred payment plan, if circumstances preclude the paying of expenses when due.

Students from the member States of the Organization of American States who wish to pursue graduate studies may apply, upon seeking admission to the University, for a fellowship grant under the terms of the Program of Fellowships and Professorships of the Organization of American States. Requests for O.A.S. fellowship applications should be directed to The Technical Secretary, O.A.S. Fellowship and Professorship Program, Pan American Union, Washington, D. C. The deadline for receipt of application for this program is February 28 for those wishing to initiate their studies in the fall, and August 31 for those who wish to enter the University on February 1. Selected advanced undergraduates may be eligible for consideration under the terms of the Organization of American States Program.

Academic Regulations and Procedures

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 adviser. 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 to 19 hours of credit each semester with the approval of his academic adviser. Normally a student will register for a course load of 15 to 18 credit hours.

A student who wishes to register for less than 12 or more than 19 semester hours may petition the Committee on Academic Standing on forms provided by the Office of 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 when, in the judgment of the Committee, unusual circumstances, such as physical disability, exist. Such petitions should be accompanied by appropriate documentation.

Change of Registration

A student may, with the approval of his academic adviser, change his registration during the first two weeks of the semester. The Office of the Registrar will make the relevant forms available. No record is made of courses dropped during this period. No courses may be added after the second week.

A student may drop a course between the beginning of the third and the end of the ninth week of the semester, provided that he has the approval of his academic adviser and that this withdrawal 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 changes in registration will be permitted.

Late Registration

Registration after the close of the announced Registration Period entails the payment of a service fee of $15.00. Registration is not permitted after the end of the second week of classes. A student is registered when the appropriate forms have been filed with the Registrar and arrangements regarding tuition and fees have been made with the Business Office.

Auditing

Regularly enrolled students may audit a course by procuring the written permission of the instructor and filing it with the Registrar during the registration period. Attendance of a course for a session or brief period requires only the verbal approval of the instructor. No petitions to change from audit to credit status will be allowed after the second week.

Assignment of Grades

In each course final grades are given at the end of the semester, except in the year-long courses designated by a dash (as Biology 291-292). In such courses a final letter grade is given only after both semesters have been completed; the grade given at the end of the first semester is advisory.

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 1st for courses taken in the prior spring semester and March 15th 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 of which will be assigned only after the completion of two semesters.

J (Audit) means registered as an auditor.

Repeating Courses

With the approval of his adviser, 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 single course may be counted only once in satisfying credit-hour requirements.

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, and J are not included in the grade-point average. To work out 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 that the course carries; 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.

Transfer Students

For the purpose of interpreting academic regulations, transfer students will be placed in class according to the following schedule of semester hours earned elsewhere and accepted for credit in the University: Freshman 0-23, Sophomore 24-54, Junior 55 or more.

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.

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.

Students on academic probation for two consecutive semesters will be suspended. Students placed on academic probation for three non-consecutive semesters 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. One semester must elapse before suspended students will be eligible for readmission. Petitions for readmission will be considered by the Committee on Academic Standing after appropriate forms have been filed with the Office of the Registrar. A student who has been suspended twice will not be eligible for readmission.

Dean's List

Students 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 Deans' List. This list will be circulated to all members of the faculty. Attainment of the Deans' List will be noted on the student's official transcript.

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 withdraw on or before the day of the last class meeting prior to the 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 from the University and who wish to be readmitted must file a petition with the Committee on Academic Standing on forms provided by the Office of the Registrar.

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.

Cancellation of Courses

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

Requirements for the Bachelor of Arts and Bachelor of Science Degrees

All candidates for the Bachelor of Arts and Bachelor of Science degrees must satisfy the following requirements, normally by attaining a passing grade in appropriate courses and exceptionally by being granted an exemption:

a. English 101, 102 — 6 credits

b. Humanities — 12 credits

c. Social Science — 12 credits
(This requirement is to be satisfied by the successful completion of courses from 3 of the 6 Social Science departments.)

d. Two one-year sequences of course work in the areas of mathematics and science (biology, chemistry, earth and space sciences, physics), with one of the years in a course that includes a laboratory; in meeting this requirement no more than one year of course work may be taken in a single department. — 14-16 credits

e. Physical Education — 2 semesters

Students are to complete the above requirements at the earliest possible time, except in Physical Education in which case the requirement is to be completed *after* the Freshman year.

Each candidate is required before graduation to demonstrate a two-year level of achievement in the foreign language approved for his program. This achievement may be demonstrated either by (a) passing a proficiency examination upon admission to this institution or (b) satisfactorily completing a second-year course in the foreign language approved for his program. Proficiency is thus the level of achievement normally attained after approximately two years of college study of the foreign language.

For graduation a student must have earned at least 120 credits and a cumulative grade-point average in all his courses of 2.00.

The undergraduate must meet the requirements of one of the departmental programs of concentration.

Any student admitted without advanced standing will in his first year take two semesters of English composition; one year of mathematics or natural sciences; two semesters of Humanities *or* two semesters of Social Science.

Courses to meet the Humanities requirement are to be chosen from the following: Humanities 103, 104, 105, 106, 112, 113, 114, 115, 116, 121, 122, 123. No more than 6 hours of work may be taken in any one of the following areas: Fine Arts (Humanities 112, 113, 114, 115, 116), Literature (Humanities 103, 104, 105, 106), Philosophy (Humanities 121, 122, 123). There is no prescribed sequence nor prerequisite for any of the Humanities courses except for Humanities 112.

Courses to meet the Social Science requirements are to be chosen from the following: Anthropology 101, 102; Economics 101, 102; History 101, 102; Political Science 101, 102, Psychology 101, and any Psychology course for which the prerequisites have been fulfilled and Sociology 101, 102.

Students majoring in the Departments of English, Fine Arts, Foreign Languages and Literatures, and Philosophy must select two semesters from the above Humanities courses in the freshman year.

Students majoring in the Departments of Anthropology, Economics, History, Political Science, Psychology, and Sociology must select two semesters from the above Social Science courses in the freshman year.

It is strongly recommended that a foreign language be elected in the freshman year.

A student may be exempted from any of the course requirements on the recommendation of the agency supervising the course.

Subjects of Instruction

Courses are numbered in accordance with the following general pattern:

101-199, freshman-sophomore courses

201-399, junior-senior courses

401-499, graduate courses

Courses, the titles of which are bracketed, will not be offered in 1964-1965.

The designation of courses in the official transcripts of academic records will employ the following symbols: ANT, Anthropology; BIO, Biological Sciences; CHE, Chemistry; ESS, Earth and Space Sciences; ECO, Economics; EDU, Education; EGL, English; FAS, Fine Arts (and FAA, Art; FTH, Drama and Theater; FAM, Music); FLA, Foreign Languages and Literatures (and FLC, Comparative Literature; FLF, French; FLG, German; FLK, Greek; FLI, Italian; FLL, Latin; FLR, Russian; FLS, Spanish, etc.); HIS, History; HUM, Humanities; MAT, Mathematics; PHI, Philosophy; PEM, Physical Education (Men); PEW, Physical Education (Women); PEC, Physical Education (Men and Women); PHS, Physical Science; PHY, Physics; POL, Political Science; PSY, Psychology; SOC, Sociology; SSC, Social Science.

Department of Anthropology

Professor: Louis C. Faron (Chairman)
Assistant Professor: Margaret C. Wheeler

The undergraduate program in anthropology is designed to provide the student with an introduction to the general field of anthropology, its branches, its theories and methods, and its relation to the other social sciences and the humanities. It is also intended to provide the anthropology major with an academic background suitable to specialization in a graduate program of 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 courses are required for the major in Anthropology:

A. Study within the area of the major

1. *Anthropology* 101, 102 (Introduction to Anthropology, Social Organization of Non-Western Peoples).
2. A one-semester course in *World Ethnography* (to be taken after the completion of *Anthropology* 101).
3. Nine credits, including one course in each of the following categories:
   a) a specific area course, such as *South American Ethnology, the Ethnology of South East Asia, etc.*
   b) a topical course, such as *Primitive Religion, Primitive Economics, etc.*
   c) a course on socio-cultural change or *Peasant Societies and Cultures.*
4. Two advanced courses of one semester each:
   1) Development of *Ethnological Theory and Methods.*
   2) Readings in Social Anthropology.
   (These courses are to be offered as colloquia or seminars.)

B. A selection of six additional units, either among listed departmental course alternatives or appropriate courses in other departments with the approval of adviser.

Language proficiency requirement to be met in French, German or Spanish.

Courses of Instruction

Anthropology 101. Introduction to Anthropology

An introduction to the study of man's biological and cultural heritage through a consideration of the principal sub-disciplines in the field of Anthropology: 1) Physical Anthropology, with emphasis on human origins and physical variations of the human species and with the evidence for human evolution; 2) Linguistics, dealing with the description and distribution of human language; 3) Pre-historic archaeology, emphasizing the development of social and cultural systems in the old and new worlds; and 4) Ethnology, treating the life ways of contemporary peoples with emphasis on the range of social and cultural variation in the non-western world, and a critical survey of its classification.

Prerequisite: None.

Mrs. Wheeler — Fall, 3 credits

Anthropology 102. Social Organization of Non-Western Peoples

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.

Prerequisites: Anthropology 101 or permission of instructor.

Mr. Faron — Spring, 3 credits

Anthropology 151. World Ethnography

Culture areas of the world will be studied with special reference to the peoples, and their social and cultural patterns. Selected societies will be studied in depth.

Prerequisites: Anthropology 101, 102 or permission of instructor.

Mrs. Wheeler — Fall, 3 credits

Anthropology 161. 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.

Prerequisites: Anthropology 101, 102 or permission of instructor.

Mrs. Wheeler — Fall, 3 credits

Anthropology 201. Peoples of South America

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

Prerequisites: Anthropology 101 and 102.

Mr. Faron — Fall, 3 credits

Anthropology 205. People of Africa

After a brief biological and archaeological introduction the course will focus on the range of social, economic, artistic, political and religious variations in the pre-contact period, followed by a brief discussion of the colonial period and the emerging African nations.

Prerequisities: Anthropology 101, 102 or permission of instructor.

Mrs. Wheeler — Spring, 3 credits

Anthropology 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.

Prerequisites: Anthropology 101, 102 or permission of instructor.

Mrs. Wheeler — Spring, 3 credits

Anthropology 261. Peasant Societies and Cultures

1.) The concept of peasantry will be examined from political, religious, and social class angles as well as from the more traditional economic view. 2.) These agricultural peoples, who are essentially preliterate and preindustrial are described and analyzed, especially in relation to the national societies of which they form a part. 3.) Special attention is given peasant societies in Latin America, Africa, and Asia.

Prerequisites: Anthropology 101 and 102.

Mr. Faron — Spring, 3 credits

Department of Biological Sciences

Professors: Frank C. Erk (Chairman), H. Bentley Glass, Sol Kramer
Associate Professors: Bernard D. Tunik, Edwin H. Battley, Vincent P. Cirillo, Raymond F. Jones, Robert W. Merriam, Robert E. Smolker, George C. Williams
Assistant Professors: Albert D. Carlson, Leland N. Edmunds, Jr., James A. Fowler, John J. Gaudet, George J. Hetchel, R. Peter Kernaghan, *Marvin J. Rosenberg
Research Associate: David Wallace
Instructor: *Howard C. Howland

The undergraduate program in biology is designed to prepare students for advanced study in the biological sciences, for secondary school teaching, and for certain positions in industry and research. The core of the program consists of three one-year courses and a summer field course in ecology. In addition certain courses in mathematics, chemistry, and physics are required; these courses contribute to an adequate understanding of the content of the program, and are essential for advanced work in the biological sciences.

Requirements for the Major in Biological Sciences

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

A. Study within the area of the major
Biology 101, 102 *(Introduction to Biological Science)*
Biology 151, 152 *(Cytology, Genetics and Evolution)*
Biology 201, 202 *(General Physiology)*
Biology 235 *(Field and Theoretical Ecology)*
Six additional credits in biology or in related courses, approved by the student's advisor.

B. Courses in related fields
Chemistry 101, 102 *(General Chemistry)*
Physics 161, 162 *(Introductory Physics)*
Mathematics 102, 103 *(Calculus I, II)*
Foreign Language (Proficiency in French, German, or Russian)

* On leave for the Academic Year 1965/66.

Courses in the Biological Sciences

Biology 101, 102. Introduction to Biological Science

An introductory course in biological science which acquaints the student with the nature of living organisms in terms of their structure and function; their reproduction, heredity, and development; their interrelationships with the environment; and their evolution. Closely correlated with lectures and the assigned readings are laboratory exercises which encourage the student, through independent work, to develop skill in the design, performance, and critical analysis of experiments. Three hours of lectures, and one three-hour laboratory per week.

Mr. Battley and Staff — Fall and Spring, 4 credits each semester

Biology 151, 152. Cytology, Genetics and Evolution

The emphasis is on the cytological and genetic mechanisms which underlie and provide the theoretical bases of our modern understanding of the origin, development, and modification of the individual, the population, the race, and the species. Three hours of lectures or discussion, and one three-hour laboratory per week.

Prerequisite: Biology 102 with grade of C.

Messrs. Erk, Merriam — Fall and Spring, 4 credits each semester

Biology 201, 202. General Physiology

This course considers the cell as a unit of function. Problems of tissue and organ function and interaction within organisms are considered from this viewpoint. Knowledge of the physiology of the cell is brought to bear on problems of growth, reproduction, differentiation, and maintenance. Emphasis is placed on the delineation of the broad problem areas which current and future research may enlighten. Both single-celled and multicellular organisms are used, representing both plants and animals. Two hours of lectures or discussion, and two three-hour laboratories per week.

Prerequisites: Biology 102 with a grade of C; Chemistry 101, 102.

Corequisite: Physics 161, 162.

Mr. Tunik — Fall and Spring, 4 credits each semester

Biology 235. Field and Theoretical Ecology

An examination of living organisms from the point of view of the environment, with attention to application of single and holocentric approaches to evolutionary processes, to the structure and function as a response to physical and biotic factors, and to the methods used in classifying organisms, environments, and ecosystems. The class meets six hours each day for six weeks in the summer.

Prerequisite: Biology 102 with grade of C.

Staff — Summer, 6 credits

Biology 239. 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: Biology 102 with grade of C; attainment of Junior status.

Mr. Rosenberg — Spring, 3 credits

[Biology 244. Form and Function in Higher Plants]

This course emphasizes the developmental pathways in examining the relationships between form and function in green plants. The laboratory consists of an analysis of the development, physiology, and morphology of a variety of living plants. Two hours of lectures or discussion, and two two-hour laboratories per week.

Prerequisite: Biology 102 with grade of C.

Mr. Gaudet — Spring, 4 credits

To be offered 1966-67.

Biology 247. Invertebrate Zoology

An examination of the invertebrate phyla from the viewpoint of increasing levels of structural and functional organization. Living materials are used whenever possible to emphasize the dynamic aspects of invertebrate life. Two hours of lectures or discussion, and two three-hour laboratories per week.

Prerequisite: Biology 102 with grade of C.

Mr. Hechtel — Fall, 4 credits

Biology 248. Vertebrate Zoology

This course emphasizes the structural and developmental aspects of vertebrate animals in an evolutionary context. Extensive experience with these forms is gained by detailed dissection of several key representatives of the group. Two hours of lectures or discussion, and two three-hour laboratories per week.

Prerequisite: Biology 102 with grade of C.

Mr. Smolker — Spring, 4 credits

[Biology 251, 252. Physical and Chemical Bases of Biological Systems]

This course treats fundamental biological concepts, with emphasis on the contributions of the physical sciences to the understanding of biological problems. It utilizes lectures, discussions, and laboratory work to acquaint the student with biology as a whole, but especially with the experimental framework underlying our present concepts of dynamic life processes. This

course is especially suitable for students doing their major study in chemistry or physics. Three hours of lectures or discussion, and one three-hour laboratory per week.

Prerequisites: One year of physics, one year of chemistry, and mathematics through calculus.

Fall and Spring, 4 credits each semester

To be offered 1966-67.

Biology 255. Current Topics in Biology

The participants in this informal seminar course present brief talks based on selected readings from the current literature of some area of biological investigation. The work of each semester concentrates on a different area of biology, and the course may be repeated for credit.

Prerequisite: Open to juniors and seniors with the permission of the instructor.

Staff — Fall and Spring, 1 credit each semester

Biology 291-292. Senior Project

In this course the more capable senior 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. Credit is determined on the basis of the adequacy of the project presented.

Prerequisite: Open to qualifying biology majors, after the completion of their junior year, with the consent of the chairman and the staff member who will supervise the work.

Staff — Fall and Spring, 2 to 4 credits

Biology 301. Biometry

A course in the design and conduct of experiments and the analysis of biological data. Topics included are parent and derived distributions, probability, confidence intervals tests of hypotheses, sample size, and the analysis of variance. Two hours of lectures or discussion, and one three-hour laboratory.

Prerequisites: One year of college mathematics that includes calculus or probability; and 16 credits of Biology and/or Psychology courses.

Mr. Smolker — Fall, 3 credits

Biology 311. 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 acquatic environment will be in-

vestigated by means of field and laboratory experiments. The class meets six hours each day for six weeks in the summer.

Prerequisites: Biology 102 and Chemistry 101, 102.

Mr. Gaudet — Summer, 6 credits

[Biology 331. 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 one two-hour laboratories per week.

Prerequisite: Biology 102 with grade of C; Chemistry 201, 202 and 203 or permission of instructor.

To be offered 1966-67. — Fall, 4 credits

Biology 336. Marine Biology

An introduction to the marine ecosystem with emphasis on the fishes of coastal and estuarine habitats. The demography, behavior, and physiological ecology of marine organisms are explored with relation to physical variables. Work in the field and laboratory will emphasize quantitative sampling of populations and standard oceanographic techniques in the collection of data. Two hours of lectures or discussions and six hours of laboratory and field work on Saturdays.

Prerequisites: Biology 247, 301; or equivalent.

Mr. Williams — Spring, 1965

Biology 341. Integrative Mechanisms

This course, which considers muscular physiology, neurophysiology, endocrinology, and sensory physiology, focuses upon the physiological mechanisms involved in animal behavior and the roles they play in coordinating and integrating the activities of organisms. Two hours of lectures or discussion, and two three-hour laboratories per week.

Prerequisites: Biology 201, 202.

Mr. Kramer — Fall, 4 credits

Biology 342. Ethology

A sequel to Biology 341, this course examines the behavioral activities of diverse groups of animals from the ethological, or comparative, standpoint. The evolution of inherited motor patterns which adapt organisms to their particular environments, and the relationships of such motor behavior to concepts in taxonomy, genetics, and ecology, are emphasized. Two hours of lectures or discussion, and two three-hour laboratories per week.

Prerequisites: Biology 201, 202, 341.

Mr. Kramer — Spring, 4 credits

Graduate Courses

(For details see the *Graduate Bulletin*)

Biochemistry
Theory and Use of Radioisotopes in Biology
Cellular Biology
Physiological Genetics
Genetics of Microorganisms
Comparative Physiology and Biochemistry of Lower Plants
Plant Morphogenesis
Population and Community Ecology
Experimental Embryology
Comparative Physiology
Seminar on Molecular Biology
Current Problems in Animal Behavior
Interarea Seminar
Research
Departmental Colloquium

Department of Chemistry

Professors: Francis T. Bonner (Chairman), *Fausto Ramirez, Sei Sujishi

Associate Professors: John M. Alexander, Edward M. Kosower, Paul C. Lauterbur, **William J. le Noble

Assistant Professors: Ivan Bernal, Robert S. Boikess, Theodore D. Goldfarb, Noboru Hirota, C. William Kern, Arthur R. Lepley, Robert F. Schneider, Richard Solo

The Undergraduate 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, and meets the certification standards of that Committee.

In general, students intending to teach chemistry in secondary schools are advised to register for the program leading to the Bachelor of Science in Physical Science (see page 131). A student who plans to complete the requirements for the B.S. degree with a major in chemistry and intends simultaneously to acquire certification for secondary school teaching must have the approval of the Chairman of the Department of Chemistry and the Director of Teacher Preparation.

The Chemistry program comprises required course work of one year each in general chemistry, quantitative chemistry, organic chemistry, organic chemistry laboratory, and physical chemistry, and one semester each in physical chemistry laboratory, in experimental methods of chemistry, and in advanced inorganic chemistry. In addition, the student is required to complete two years of mathematics and at least three semesters of physics.

Requirements for the Major in Chemistry

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

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* On Leave for the Academic Year 1965-1966.

** On Leave for the Fall Semester 1965.

A. Study within the area of the major

Chemistry 101, 102, or 103, 104 (General Chemistry or Introduction to Modern Chemistry)
Chemistry 151, 152 (Quantitative Chemistry)
Chemistry 201, 202 (Organic Chemistry)
Chemistry 203, 204 (Organic Chemistry Laboratory)
Chemistry 235, 236 (Physical Chemistry)
Chemistry 251 (Physical Chemistry Laboratory)
Chemistry 301 (Experimental Methods of Chemistry)
Chemistry 305 (Intermediate Inorganic Chemistry)

B. Courses in related areas

Mathematics 102, 103 (Calculus I, II) and 155, 156 (Calculus III, IV)
Physics 101, 102, 151 (General Physics)

Foreign Language: The proficiency requirement must be met in German

Courses in Chemistry

Note: Students requesting that prerequisites or corequisites be waived may, in exceptional circumstances, receive approval following petition to the Chairman of the Department of Chemistry.

Chemistry 101, 102. General Chemistry

The first year of a two-year sequence preparatory to advanced study in chemistry, designed at the same time to meet the general chemistry requirements of students who do not plan to specialize in the subject. 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. The historical development of current chemical theory is treated to the extent that it adds meaningful perspective to the discussion. The descriptive facts of chemistry are discussed in terms of and as examples of the principles as they are developed. Carefully selected laboratory experiments are used to illustrate the principles presented and to provide the student with experience in chemistry. Principal topics covered are the states of matter, gas laws, kinetic theory, chemical combination and the atomic theory, chemical equations and stoichiometry, properties of the elements and the periodic table, atomic structure, chemical bonding, oxidation-reduction reactions, solutions, electrolytes, ideal systems at equilibrium, and selected topics in descriptive chemistry. Two lecture hours, one recitation hour, and four laboratory hours per week.

Staff — Fall and Spring, 4 credits each semester

Chemistry 103, 104. Introduction to Modern Chemistry

An intensive introductory chemistry course parallel to Chemistry 101, 102 designed to meet the needs and interests of the better-prepared student planning to specialize in one of the physical sciences or engineering. The subject matter will be similar to that of Chemistry 101, 102 but the discussion of chemical principles will be more detailed and will presuppose a familiarity with basic mathematical and physical concepts. The fundamentals of chemical thermodynamics will be introduced as a foundation for the study of thermochemistry and chemical equilibrium. Open to those freshmen students who have offered for admission a record indicating exceptional ability and interest in mathematics and the physical sciences. In addition all upperclassmen who have successfully completed Physics 101, 102 are urged to elect this course rather than Chemistry 101, 102. Two lecture hours, one recitation hour, and four laboratory hours per week.

Corequisites: Physics 101, 102 and Mathematics 102, 103.

Staff — Fall and Spring, 4 credits each semester

Chemistry 151, 152. Quantitative Chemistry

In the first semester, ideal chemical equilibrium systems, particularly aqueous solutions, are discussed. Equilibria involving solubility products, acid-base ionization constants, and electrode potentials are treated in detail. The laboratory work is designed to develop techniques which are essential for precise and accurate chemical analysis. Experiments involving calibration of equipment, gravimetric and volumetric analyses are included.

In the second semester, non-ideal chemical equilibrium systems and chemical kinetics are included. The objective of the laboratory work is to obtain significant physico-chemical data, such as equilibrium and rate constants, with reliance upon the techniques developed in the first semester. Two lecture hours and six laboratory hours per week.

Prerequisite: Grade of C or better in Chemistry 102 or 104.

Corequisite: Mathematics 155 (or Mathematics 103 for students who have taken Mathematics 101).

Messrs. Bernal, Schneider — Fall and Spring, 4 credits each semester

Chemistry 201, 202. Organic Chemistry

A systematic discussion of the structure, physical properties, and chemical reactions of the main classes of carbon compounds. A treatment of electronic, stereochemical, and kinetic theory precedes a discussion of reactions. Mechanistic aspects of organic reactions are emphasized as well as the use of these reactions in synthesis. Carbohydrates, proteins, liquids, vitamins, polymers and dyes are briefly examined. Three lecture hours per week.

Prerequisite: Grade of C or better in Chemistry 102 or 104.

Corequisite to Chemistry 201: Chemistry 203.

Mr. Boikess — Fall and Spring, 3 credits each semester

Chemistry 203, 204. Organic Chemistry Laboratory

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. Eight laboratory hours per week.

Corequisites: Chemistry 201, 202.

Mr. Lepley — Fall and Spring, 2 credits each semester

Chemistry 235, 236. Physical Chemistry

A continuation and amplification of the physical interpretation and mathematical analysis of chemical phenomena begun in Chemistry 152. Emphasis is given to the theoretical explanation of empirical laws. Considerable time is spent in the development and application of the laws of thermodynamics to ideal and real systems. Statistical thermodynamics and wave mechanics are given sufficient introductory treatment to serve as a basis for studies of chemical kinetics, the states of matter, and molecular structure. Three lecture hours each week.

Prerequisites: Chemistry 152, Physics 102.

Corequisite: Mathematics 156.

Mr. Solo — Fall and Spring, 3 credits each semester

Chemistry 251. Physical Chemistry Laboratory

An introduction to the modern technique of physicochemical experimentation. The student is given a choice of experiments in such areas as thermochemistry, electro-chemistry, crystallography, molecular spectroscopy, and chemical kinetics. Independent investigation is stressed. Use of the chemical literature, including reference works and journals, is required in preparation of formal laboratory reports. Seven hours of laboratory and one hour of lecture per week.

Corequisite: Chemistry 236.

Mr. Solo — Spring, 3 credits

Chemistry 301. Experimental Methods of Chemistry

Training in the use of various instrumental methods commonly employed in the chemical laboratory, such as spectroscopy, chromatography, stable and radioactive tracer analysis, polarography, etc. Lectures deal with the theoretical as well as the practical aspects of instruments and instrumental methods. In the laboratory, the principal stress is on the analytical aspects of instrumental techniques. Two lecture hours and six laboratory hours per week.

Prerequisites: Chemistry 202, 204, 236, and 251.

Mr. Lauterbur — Fall, 4 credits

Chemistry 302. Experimental Methods of Organic Chemistry

An introduction to the techniques used in organic chemistry research. Separation, purification and structural elucidation by chemical and instrumental procedures. Laboratory work includes qualitative organic analysis and organic synthesis. Projects of an exploratory nature will be assigned to specially qualified students. Two lecture hours and six Lab hours per week.

Prerequisite: Chemistry 301.

Mr. Boikess — Spring, 4 credits

Chemistry 305. Intermediate Inorganic Chemistry

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.

Prerequisites: Chemistry 202, 204, 236 and 251.

Mr. Sujishi — Spring, 3 credits

Chemistry 315. Intermediate Organic Chemistry

An extension of the material introduced in Chemistry 201, 202. Electronic and stereochemical theory are utilized to discuss selected organic reactions, syntheses, and natural products.

Prerequisites: Chemistry 202 and 204. Three lecture hours per week.

Mr. Kosower — Fall, 3 credits

Chemistry 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 Schroedinger equation, applications to the problems of chemical bonding, and atomic and molecular spectroscopy. Three lecture hours per week.

Prerequisite: Chemistry 236.

Mr. Lauterbur — Spring, 3 credits

Chemistry 391, 392. Senior Research

Research to be carried out under the supervision of a staff member of the Department, on a research problem to be selected by the student after consultation with his staff supervisor. The results of this work are to be submitted to the Department in the form of a senior research report.

Students who have achieved a cumulative grade point average of 3.00 or higher through their first five semesters and are interested in registering for this course should first apply to a staff member for tentative acceptance as a research student and then file a written petition with the Chairman of the Department no later than the second Monday in May preceding the student's senior year.

Prerequisites: A cumulative grade point average of 3.00 or higher and acceptance as a research student by a member of the departmental staff.

Staff Fall and Spring, 2 credits each semester

Note: Senior chemistry students having high academic standing may petition the Department for permission to register in the following first year graduate courses:

Advanced Inorganic Chemistry
Advanced Organic Chemistry
Chemical Kinetics
Chemical Thermodynamics
Introduction to Statistical Mechanics
Nuclear Chemistry
Physical Inorganic Chemistry
Physical Organic Chemistry
Quantum Chemistry I
Quantum Chemistry II

Department of Earth and Space Sciences

Professors: O. A. Schaeffer, (Geochemistry) Chairman, Samuel S. Goldich (Geology)

Associate Professor: Hong-Yee Chiu (Astrophysics)

Assistant Professor: Robert T. Dodd, Jr., (Mineralogy)

The earth and space sciences undergraduate program prepares the student for gainful scientific participation in the explorations of the oceans, the earth, and the universe which are presently being conducted by industry, governmental agencies and academic institutions. These are areas of science in which the enormity of time or space take on an added significance. As a result, there is a fundamental interrelation of the principles involved. For this reason, the areas of oceanography, geology, geophysics, geochemistry, meteorology and astronomy are to be incorporated in a single department. While, the undergraduate program is designed primarily to prepare the student for graduate study leading to an advanced degree; it can also serve as a terminal course of instruction in preparation for employment by a private industry, a government agency or an academic institution. Oil and mineral exploration, geochemical, geophysical, or astronomical research, or professional meteorology are several of the many possible areas of employment.

At present, an undergraduate major program is offered in the earth sciences. In subsequent years it is anticipated other areas will be added.

Requirements for the Major in Earth Sciences:

In addition to the general University requirements, the following courses are required for the Major in Earth Sciences:

A. Study within the area of the major

Earth and Space Sciences 101, 102 *(Introduction to Earth and Space Sciences)*

Earth and Space Sciences 151, 152 *(Mineralogy, Petrology)*

Stratigraphy and Structural Geology 6 credits

Regional Geology 6 credits

(Summer field courses – Four to six weeks in the summer after the junior year.)

B. Courses in related areas

Chemistry 101, 102 *or* 103, 104 *(General Chemistry)*
Mathematics 102, 103 *(Calculus I, II)*
Mathematics 155, 156 *(Calculus III, IV)*
Physics 101, 102 *(General Physics)*

Foreign Language: The proficiency requirement must be met in German or Russian.

Courses in Earth and Space Sciences

Earth and Space Sciences 101. Introduction to Earth and Space Sciences I

A general survey course of astronomy. The course is an introductory course for the major in earth and space sciences designed at the same time when combined with ESS 102 to meet the laboratory science elective for the B.A. or B.S. degree and the earth science requirement for students who seek secondary school science teaching certification. Emphasis is placed on the physical and chemical principles and ideas. The subject is introduced in an historical manner and the modern ideas are interpreted on the basis of the present observations. Topics covered are determination of planetary and stellar distances; stellar spectra, masses of stars, structure and energy of the sun and stars, stellar evolution, cosmic rays, and galaxies. No mathematical facility beyond simple alegbra is required. The laboratory is devoted to telescopic observation and optical and spectroscopic measurement. Two lecture hours, one recitation hour and one three-hour laboratory per week.

Fall, 4 credits

Earth and Space Sciences 102. Introduction to Earth and Space Sciences II

A general survey course of the Earth Sciences can either follow or precede ESS101. The course is an introductory course for the major in earth and space sciences designed at the same time, when combined with Earth and Space Sciences 101, to meet the laboratory science elective for the B.A. or B.S. degree and the earth science requirement for students who seek secondary school science teaching certification. Emphasis is placed on the physical and chemical principles and ideas. The topics covered are the planets, the moon, the earth's interior, the oceans, the atmosphere, rocks and minerals and the land forms. The laboratory consists of telescopic observation of the moon and planets, the physical and chemical properties of rocks and minerals, meteorological observation and simple oceanographic observation. Two lecture hours, one recitation hour and one three-hour laboratory per week.

Spring, 4 credits

Earth and Space Sciences 151. Mineralogy

The chemistry and physics of minerals, including crystallography (X-ray and optical), mineralogy, crystal chemistry, and the description of various common minerals. The laboratory will include techniques of microscopic observation including use of polarized light, X-ray diffraction, and chemical and physical properties of minerals. Two lecture hours, and two three-hour laboratory sessions per week.

Prerequisites: Earth and Space Sciences 102, Chemistry 102 or 104, or permission of the instructor.

Fall, 4 credits

Earth and Space Sciences 152. Petrology

The chemistry and physics of mineral assemblages. Rocks are studied in thin section and the various mineral assemblages are studied in reference to chemical principles. Igneous, metamorphic and sedimentary rocks are included. Emphasis is placed on the transitional character of many igneous and metamorphic phenomena. The laboratory is mainly devoted to a microscopic examination of rocks in thin section. Two lecture hours, and two three-hour laboratory sessions per week.

Prerequisite: Earth and Space Sciences 151.

Spring, 4 credits

Earth and Space Sciences 161, 162. Astronomy I, II

An introduction to astronomy for students with mathematical and physics preparation. The first half is concerned with stellar phenomena, the extent of the universe, cosmology and astrophysics. The second half is concerned with the solar system, planetary mechanics, comets, meteors, and the origin of the solar system.

Prerequisites: Physics 153, Mathematics 156, Earth and Space Sciences 101, or permission of instructor.

Fall and Spring, 3 credits each semester

Department of Economics

Professor: Robert Lekachman (Chairman)
Associate Professors: Charles Hoffmann, Marvin M. Kristein, Charles E. Staley
Assistant Professors: *Eliyahu Kanovsky, Woo Sik Kee, Edwin F. Terry
Instructor: Edward Van Roy

Requirements for the Major in Economics

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

A. Study within the area of the major

Economics 101, 102 *(Economic Principles and Problems)*
Economics 211 *(Economic Analysis)*
Economic 212 *(National Income Analysis)*
Economic 221 *(Economic Statistics)*
Fifteen additional credit hours in courses in Economics.

B. Courses in related areas

Twelve credit hours in courses in related areas in the Social Sciences approved for the student's program.

Courses in Economics

Economics 101, 102. Economic Principles and Problems

A basic introduction to Economic Analysis on the "macro" and "micro" levels, with an emphasis on economic policy. Among other significant issues, the course emphasizes the fundamental thinking basic to understanding policies dealing with the business fluctuations, anti-trust problems, foreign trade and the farm problem. The first semester emphasizes "macro" economics, the second "micro" economics.

Prerequisite for Economics 102: Economics 101 or permission of instructor.

Staff — Fall and Spring, 3 credits each semester

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* On Leave for the Academic Year 1965-1966.

Economics 201. Money, Banking and Monetary Theory

An introduction to modern monetary institutions and mechanisms, their relationship to the economy, and governmental policies in this area. Monetary theory and its application to policy questions will be stressed.
Prerequisite: Economics 101 or permission of instructor.

Mr. Kristein — Fall, 3 credits

Economics 202. Business Fluctuations

The measurement and analysis of prosperity and depression. The statistical evidence for the existence of "cycles" is examined. Theories of "cycles" and fluctuations are historically studied and "tested."
Prerequisite: Economics 201 or permission of instructor.

Spring, 3 credits

Economics 203. Public Finance

An analysis of the economic aspects of budgets, taxation and tax systems in the federal, state and local governmental context. The theory of tax incidence and taxes on property, incomes, consumption, etc., are examined as to nature, administration and economic effects. Intergovernmental fiscal relations are also covered.
Prerequisite: Economics 101, 102 or permission of instructor.

Mr. Kee — Fall, 3 credits

Economics 206. 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: Economics 101 or permission of instructor.

Spring, 3 credits

Economics 210. International Economics

The course covers the theory of international trade, protection, commercial policy customs unions, capital movements, and international finance.
Prerequisite: Economics 101, 102 or permission of instructor.

Mr. Kristein — Spring, 3 credits

Economics 211. Economic Analysis

Economic theory of cost, demand, price and markets. The application of theory to familiar problems is emphasized.
Prerequisites: Economics 101, 102 or permission of instructor.

Mr. Staley — Fall, 3 credits

Economics 212. National Income Analysis

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

Prerequisites: Economics 101, 102 or permission of instructor.

Spring, 3 credits

Economics 221. Economic Statistics

The purpose of this course in Economic Statistics is to prepare the student to deal with a variety of statistical studies basic to Economics and related Social Sciences. The course will emphasize the collection, presentation, analysis and interpretation of various statistics. The first semester emphasizes collection, presentation, central tendency, measures of significance and correlation. Three hours of lecture and two hours of laboratory work.

Mr. Terry Fall, 4 credits

Economics 222. Economic Statistics

A continuation of Economics 221, which is a prerequisite.

Mr. Terry Spring, 4 credits

Economics 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.

Prerequisites: Economics 101, 102 or permission of instructor.

Mr. Van Roy Fall, 3 credits

Economics 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.

Prerequisites: Economics 101, 102 or permission of instructor.

Mr. Hoffmann Fall, 3 credits

Economics 236. Economic Development of Modern Europe

An investigation of changes in the structure of the European economy over the past four centuries with emphasis on the roles played by public policy, technological evolution, and the transformation to the market

system. The relevance of current theories of economic growth to the European experience will be discussed.

Prerequisites: Economics 101, 102 or permission of instructor.

Mr. Van Roy — Spring, 3 credits

Economics 304. Fiscal Policy

The economics of government surplus, deficits, and debt. Fiscal theories and programs to sustain economic stability, high levels of employment and income and economic growth are analyzed with emphasis placed on contemporary policy problems. Fiscal policy is also related to monetary policy.

Prerequisites: Economics 212 or permission of instructor.

Mr. Kee — Spring, 3 credits

Economics 311. History of Economic Thought

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

Prerequisites: Economics 211, 212 or permission of instructor.

Mr. Lekachman — Fall, 3 credits

Economics 321. Econometrics

An introduction to the mathematical approach to the measurement and extrapolation of economic variables and the testing of economic theories. The mathematical formulation of models and data provides an invaluable tool to the solution of macroeconomic problems facing the student and policy-maker.

Prerequisites: Economics 211, 212, 221 or permission of instructor.

Mr. Terry — Fall, 3 credits

Economics 322. Economic Development

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

Prerequisites: Economics 211, 212 or permission of instructor.

Mr. Hoffmann — Spring, 3 credits

Economics 342. 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.

Prerequisites: Economics 211, 212 or permission of instructor.

Mr. Hoffmann — Spring, 3 credits

Economics 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

Department of Education

Professors: Frank R. Peters (Acting Chairman and Director of Teacher Preparation), Leonard Gardner
Instructor: Eli Seifman

The Department offers programs in education which fulfill the requirements for New York State provisional certification of secondary school teachers, and advises prospective teachers with regard to the fulfillment of certification requirements.* In addition, the Department is preparing programs in elementary education for prospective elementary school teachers.

Secondary Education Teacher Certification

Students wishing to teach in secondary schools may take Bachelor of Arts or Bachelor of Science degree programs which include New York State requirements for teacher certification. These requirements include at least 18 hours in Education, including Methods and Materials of Teaching, 3 hours; Practice Teaching, 6 hours; History and Philosophy of Education, 6 hours. Departmental advisors and the Director of Teacher Preparation will inform the student of the courses designed to satisfy these requirements in his major field. Programs leading to provisional certification are offered in the following fields: biology, chemistry, English, foreign languages, mathematics, physics and social studies.

Students who are preparing to teach social studies may major in Anthropology, Economics, History, Political Science, or Sociology.

At present, the following courses in Materials and Methods of Instruction are being offered:

Biology 239. Materials and Methods in Teaching Biology.

English 285. Methods of Instruction in Literature and Composition.

Foreign Languages and Literatures 239. Methods and Materials in Teaching Foreign Languages.

Mathematics 232. Algebra I.

* Students preparing to teach are strongly urged to check certification requirements with the Department of Education before the end of their sophomore year, so that they can plan their programs appropriately.

Physics 239. Materials and Methods in Teaching Physical Science (for those preparing to teach either physics or chemistry).

Social Science 239. Materials and Methods in Teaching Social Studies.

Elementary Education

Programs for students preparing to teach in elementary schools are being planned.

Courses in Education

Education 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.

Prerequisite: None

3 credits

Education 345-346. History and Philosophy of Education

An investigation of educational theories and institutions designed to help the student integrate his educational experience. The investigation 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. The first semester considers the history of educational institutions in their relations to social aims and to the development of the sciences. The second semester examines the fundamental presuppositions of educational theories. This course is identical with Philosophy 345-346 (History and Philosophy of Education.)

Prerequisite: Senior standing.

Messrs. Gardner, Watson, Sternfeld

Fall and Spring, 3 credits each semester

Education 350. Student Teaching

Prospective secondary school teachers receive supervised practice in teaching their subjects to secondary school classes, by arrangement with selected Long Island high schools. The student teacher reports to the school to which he is assigned for at least one-half of each school day for the semester. Frequent consultation with the supervising teacher and twice-

weekly seminar meetings with a University faculty member help the student to interpret and evaluate his apprenticeship 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.

Prerequisite: Senior standing and approval of Director of Teacher Preparation.

Mr. Seifman and Staff — Fall and Spring, 6 credits

Department of English

Professors: Jack Ludwig (Acting Chairman), Peter Alexander, Alfred Kazin, Richard L. Levin

Associate Professors: Robert P. Creed, Edward Fiess, Homer B. Goldberg, Robert M. Jordan, *Robert Marsh, Thomas Rogers, *Judah L. Stampfer

Assistant Professors: Ruth Blackburn, Carolyn Faulk, Joseph Pequigney, Sallie H. Sears, Alice S. Wilson

Instructors: Kenneth T. Abrams, Robert A. Ackerman, Elizabeth Coleman, Richard F. Dunlavey, Sidney Feshbach, Howard J. Harvey, Louise Meyerson, *Ruth Miller, Ruth R. Misheloff, Burton Raffel, William F. Walsh

Requirements for the Major in English

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

A. Study within the area of the major

1. Introductory courses, normally to be taken in the sophomore year.

   English 151 *(Interpretation of Poetry).*

   One other introductory course (*English* 161, *Interpretation of Fiction;* or any other course numbered 150-199).

2. *English* 211 *(Shakespeare).*

3. Nine additional courses in the department beyond the introductory level, to be chosen in consultation with the student's adviser. The Department expects a student to distribute the courses among a fairly wide range of period and genre. Students seeking teacher certification must include English 283, *(The English Language.)*

B. Courses in related areas

1. One year of study in a foreign *literature* in its original language.

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* On Leave for the Academic Year 1965-1966.

2. *History* 155, 156. (In special cases, a student may substitute American History in one or both semesters.)

C. Departmental examination

In his senior year, each student must pass an examination designed to test his ability to analyze literary texts.

A grade of C or better in English 101, 102 is the normal prerequisite to sophomore standing as a major in the department.

Courses in English

English 101, 102. Composition

A first-year course in writing and reading, required of all students in the University. Extensive controlled practice in writing exposition and argument, making use of essays and imaginative literature for analysis of ideas and methods and training in critical reading.

Staff — Fall and Spring, 3 credits each semester

English 151. Interpretation of Poetry

Intensive analysis of poems in English of various periods and types and varying complexity.

Staff — Fall and Spring, 3 credits

English 161. Interpretation of Fiction

Analysis of stylistic and structural modes employed by various writers of short stories and novels.

Staff — Fall and Spring, 3 credits

English 171. Interpretation of Drama

Introduction to the analysis of 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.

Prerequisite: Sophomore standing.

Staff — Fall and Spring, 3 credits

English 207. Chaucer

Primary emphasis on a study of *The Canterbury Tales* and *Troilus and Criseyde* in Middle English, with some attention to minor poems and other works.

Mr. Jordan — Fall, 3 credits

English 211. Shakespeare

Examination of Shakespeare's achievement through analysis of about fifteen plays selected to represent the major types of drama he wrote.

Mr. Levin, and Staff — Fall and Spring, 3 credits

[English 216. Renaissance Prose]

Study of the major prose writers of the sixteenth and earlier seventeenth centuries, examining their styles as well as the intellectual contents and contexts of their work.

Mr. Pequigney — Spring, 3 credits

To be offered 1966-67.

English 225. Poetry of the Early Seventeenth Century

Study of the poems of Donne, Jonson, Herbert, Herrick, Crashaw, Vaughn, and Marvell, with some attention to the minor poets of the period.

Mr. Pequigney — Spring, 3 credits

English 227. Milton

Study of all Milton's English poetry and selections from his prose works, with major emphasis on *Paradise Lost.*

Mr. Pequigney — Fall, 3 credits

English 235. Restoration and Eighteenth Century Verse

Selected lyric, satirical and intellectual poems from 1650 to 1800, with major emphasis on the poetry of Dryden and Pope.

Mr. Goldberg — Spring, 3 credits

[English 236. Restoration and Eighteenth Century Prose]

Major works of satirical, intellectual, and occasional prose of the late seventeenth and eighteenth centuries, with emphasis on Swift and Johnson.

Messrs. Goldberg, Marsh — 3 credits

To be offered 1966-67.

[English 237. Eighteenth Century English Novel]

Study of form and technique in representative works of Defoe, Richardson, Fielding, Smollett, and Sterne.

Mr. Goldberg — 3 credits

To be offered 1966-67.

English 247. Nineteenth Century English Novel

Comparative analysis of representative works of Jane Austen, Thackeray, the Brontës, Dickens, George Eliot, and Hardy.

Messrs. Goldberg, Rogers — Fall, 3 credits

[English 253. Romantic Poetry]

Works of Blake, Coleridge, Wordsworth, Byron, Shelley, and Keats.

Mr. Kazin — 3 credits

To be offered 1966-67.

[English 254. Victorian Poetry]

Works of Tennyson, Browning, Arnold, Hopkins, and Hardy, with some attention to other poetry of the period.

Messrs. Kazin, Stampfer — 3 credits

To be offered 1966-67.

English 256. Victorian Prose

Reading in Carlyle, Newman, Arnold, Huxley, Mill and Ruskin.

Mr. Rogers — Spring, 3 credits

English 260. Readings in Modern Literature

Study of late nineteenth and twentieth century works, relating developments in English and American literature to intellectual and aesthetic currents on the Continent.

Miss Sears — Spring, 3 credits

[English 265. Modern British and American Poetry]

Study of the achievement of twentieth century poetry in English, concentrating on Yeats, Eliot, Auden, Stevens, Thomas, and Frost.

Messrs. Ludwig, Stampfer

To be offered 1966-67.

English 267. Contemporary British and American Novel

Study of the works of such figures as Joyce, Lawrence, Fitzgerald, Faulkner, Hemingway, and Forster, as well as more recent developments.

Mr. Ludwig — Spring, 3 credits

English 271. Representative Figures in American Literature I

Examination of the work of major American writers from the colonial period to the Civil War.

Mr. Fiess — Fall, 3 credits

English 272. Representative Figures in American Literature II

Examination of the work of major American writers from the Civil War period to the present. Continuation of 271, but may be taken separately.

Mr. Fiess — Spring, 3 credits

English 281. Literary Criticism

Study of the problems and procedures of literary criticism through analysis and application of various approaches to the interpretation and evaluation of literary works.

Mr. Jordan and Staff — Fall and Spring, 3 credits

English 283. The English Language

A linguistic approach to contemporary English, with some attention to the history of the language; phonemics, usage, and applied linguistics are stressed.

Messrs. Creed, Raffel, and Staff — Fall and Spring, 3 credits

English 285. 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. Rogers and Staff — Fall and Spring, 3 credits

English 295. The Bible as Literature

Study of literary forms and themes in selected readings from the Old and New Testaments.

Fall, 3 credits

English 306. Middle English Literature

Study of major works of prose, poetry, and drama of the fourteenth and fifteenth centuries, exclusive of Chaucer, in Middle English.

Prerequisite: English 207 or consent of instructor.

Mr. Jordan — Spring, 3 credits

English 313. Tudor and Stuart Drama

Study of representative plays of the major dramatists (excluding Shakespeare) and genres from the beginnings of English secular drama to the closing of the theaters in 1642.

Prerequisite: English 211 or consent of instructor.

Mr. Levin — Fall, 3 credits

English 315. Elizabethan Poetry

Readings in Ralegh, Spenser, Sydney, Daniel, Davies, Marlowe, and Shakespeare.

Prerequisite: Senior standing or consent of instructor.

Mr. Pequigney — Fall, 3 credits

English 333. English Drama, 1660-1780

Comparative analysis of representative works of the major dramatists from Dryden to Sheridan, with emphasis on the diverse forms of serious drama and the changing conception of comedy.

Prerequisite: English 211 or consent of instructor.

Mr. Goldberg — Spring, 3 credits

English 344. Romantic Revival

The French Revolution (the aftermath of the American); its influence on Wordsworth and Coleridge; their development as poets; the relation of Keats and Shelley to the Romantic movements; the criticism associated with the period; its prose.

Prerequisite: Senior standing or consent of instructor.

Mr. Alexander — Fall, 3 credits

[English 365. Joyce]

The poetry and fiction of James Joyce will be read, including passages from *Finnegan's Wake*. Selected works will be carefully analyzed, with *Ulysses* the major emphasis.

Prerequisite: Senior standing, or consent of instructor.

Mr. Ludwig — 3 credits

To be offered 1966-67.

[English 366. William Butler Yeats]

Readings in the poetry, plays, autobiographies, and letters.

Prerequisite: Senior standing, or consent of instructor.

Mr. Ludwig — 3 credits

To be offered 1966-67.

English 371. Proseminar in Major American Authors I

Intensive study of major American writers of the earlier nineteenth century.

Prerequisite: Senior standing or consent of instructor.

Mr. Kazin — Fall, 3 credits

English 372. Proseminar in Major American Authors II

Intensive study of major American writers of the later nineteenth and twentieth centuries.

Prerequisite: Senior standing, or consent of instructor.

Mr. Kazin — Spring, 3 credits

English 375. Major American Poets

Studies in American poetry from Emerson to Robert Frost.

Prerequisite: Senior standing, or consent of instructor.

Mr. Kazin — Spring, 3 credits

English 381. History of Literary Criticism I

Analytic survey of major texts in the history of European literary theory and criticism from ancient times through the middle ages.

Prerequisite: English 281, senior standing, or consent of instructor.

Mr. Jordan and Staff — Fall, 3 credits

English 382. History of Literary Criticism II

Analytic survey of major texts in the history of European literary theory and criticism from the early Renaissance to the present. May be taken independently of English 381.

Prerequisite: English 281, senior standing, or consent of instructor.

Mr. Jordan and Staff — Spring, 3 credits

[English 394. Satire and the Satiric Spirit]

Critical analysis of satire and the satiric spirit from Aristophanes through Horace, Juvenal, and Persius, to writers such as Chaucer, Rabelais, Ben Jonson, Moliere, Dryden, Swift, Voltaire, Pope, Byron, Stendhal, Flaubert.

Prerequisite: Senior standing or consent of instructor.

Mr. Ludwig — 3 credits

To be offered 1966-67.

English 399. Independent Project

Advanced tutorial culminating in a major essay, permitting the student to apply his acquired disciplines and knowledge in a rigorous and original manner to a restricted topic in English or American literature.

Staff — Spring, 3 credits

Department of Fine Arts

Professor: John Newfield (Drama), Chairman
Associate Professors: Bernard Greenhouse (Music), Allan Kaprow (Art), Paul Makanowitzky (Music), Isaac Nemiroff (Music)
Assistant Professors: Edward A. Bonvalot (Music History), Edward J. Countey, Jr. (Art), Jacques Guilmain (Art History), Charles L Holt (Drama), Milton B. Howarth (Drama), John Lessard (Music), Mark D. Orton (Music), Robert W. White (Art)
Instructors: Martin Canin, (Music), Ted Gorelick (Art History)

This Department includes the fields of Art, Music, Theater Arts and offers programs leading to the Bachelor of Arts degree in either Art, Music, or Drama and Theater.

I. 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:

A. Study within the area of the major

1. Studio Courses (Art 121, 122, 123, 124) — 12 credits
2. Theory and History — 21 credits

B. Courses in related areas

Electives in Music and Theater Arts — 6 credits

C. Departmental Examination

During the senior year all art majors must pass a departmental examination on certain aspects of the theory and history of art. The faculty will select a set list of books covering these fields.

Courses in Art

Art 121. Studio I (Drawing)

Drawing, the fundamental of pictorial art, as a grammar of elements: points, lines, planes, volumes, tones, spaces, images, etc., their expressive possibilities. 6 hours studio work.
Prerequisite: Permission of instructor.
Mr. White — Fall, 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 sculptor's tools, and simple problems in three-dimensional design are supplemented by some lectures and recitations on the formal principles of sculpture as a medium. 6 hours studio work.

Prerequisite: Art 121, or permission of instructor.

Mr. White — 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. 6 hours studio work.

Prerequisite: Art 121, or permission of instructor.

Mr. Kaprow — Fall, 3 credits

Art 124. Studio IV (Design)

A studio course in the techniques of perspective drawing, isometric projection, multi-phase drawings, motion studies, graphs, and analytical drawings, and their application to a selected project. 6 hours studio work.

Prerequisite: Art 121, or permission of instructor.

Mr. Countey — Fall, 3 credits

Art 221. Studio V (Advanced Painting II)

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.

Mr. Kaprow — Fall, 3 credits

Art 222. Studio VI (Modeling, Casting, and 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 and 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. 6 hours studio work.

Prerequisite: Art 122, or permission of instructor.

Mr. White — 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. 6 hours studio work.
Prerequisite: Art 121, or permission of instructor.

Mr. Countey — Fall, 3 credits

Art 231. Ancient Art

The history of art in the Ancient World from earliest times through the Roman period.
Prerequisite: None.

Mr. Guilmain — Fall, 3 credits

Art 232. Medieval Art

European Art from the Early Christian through the Gothic period.
Prerequisite: Art 231, or permission of instructor.

Mr. Guilmain — Spring, 3 credits

Art 235. Modern Painting

The course is introductory for those with an interest in modern painting, but with no previous experience. Emphasis is placed on looking at and understanding an art which is not based on natural appearances, but which has a human and expressive basis. The logical evolution of its varied forms is traced to realistic beginnings.
Prerequisite: None.

Mr. Kaprow — Fall, 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: None.

Staff — 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. 6 hours studio work.
Prerequisite: Art 221 or permission of instructor.

Mr. Kaprow — Spring, 3 credits

Art 322. Studio IX (Stone and Wood Carving Techniques)

A studio course designed to develop the student's technical and compositional skills in the making of sculpture created in hard materials through subtractive techniques. The study and practice of stone and wood carving. 6 hours studio work.

Prerequisite: Art 122 or permission of instructor.

Mr. White — 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 20th century print making. 6 hours studio work.

Prerequisite: Art 123, or permission of instructor.

Mr. Countey — Spring, 3 credits

Art 332. Italian Renaissance Art

Renaissance painting, sculpture, and architecture in Italy.

Prerequisite: Art 232, or permission of instructor.

Mr. Guilmain — Fall, 3 credits

Art 333. Northern Renaissance Art

Renaissance painting, sculpture, and architecture in Northern Europe.

Prerequisite: Art 232, or permission of instructor.

Mr. Gorelick — Fall, 3 credits

Art 334. Baroque and Rococo Art

European art in the age of Baroque and Rococo.

Prerequisites: Art 332 or 333, or permission of instructor.

Mr. Gorelick — Spring, 3 credits

Art 336. Modern Art

European Art of the 19th and 20th centuries.

Prerequisite: Art 334, or permission of instructor.

Mr. Kaprow — Fall, 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: At least three courses in Art History or permission of instructor.

Mr. Guilmain — Fall, 3 credits

II. Requirements for the Major in Music

In addition to the general University requirements for the Bachelor of Arts degree, the following courses are required for the major in Music.

A. Study within the area of the major

1. Music Theory (Music 121, 122, 221, 222, 321, 326) — 18 credits
2. Music History (Music 237, 240, 323) — 9 credits
3. Applied Music — 16 credits
   (With permission of the Chairman of the Department the student can take only 8 credit hours in Applied Music and apply the remaining 8 credits to Theory and/or History.)

B. Study in related areas

1. Electives in Art and Theater Arts — 6 credits

C. Entrance Requirements

The entering student who chooses to declare himself a major in music can do so only after having satisfied the Department of his technical ability and previous experience.

D. Departmental Examinations

1. Piano Proficiency: Students whose declared major is music must, prior to their junior year, pass a proficiency examination in piano. They will be required to play simple piano pieces (chosen by the Department), and demonstrate a sufficient acquaintance with the keyboard to be able to play theory examples as these occur in the course of study.
2. Departmental Examination: During the senior year all music majors must pass a departmental examination on certain aspects of music selected by the faculty.

E. Departmental Requirement

1. All music majors have to participate in the University Chorus for two years.

Courses in Music

Music 101. University-Community Choir

Study and performance of a repertory from the Middle Ages to the present. Meeting twice weekly. Attendance at rehearsals and performances obligatory. Open to students, faculty, staff, and outsiders.
Prerequisite: Auditions.

Mr. Orton — Fall and Spring, no credit

Music 102. Instrumental Instruction

Half-hour or one-hour individual lessons each week, with 5-10 hours practice required.
Prerequisite: Permission of instructor.

Messrs. Canin (piano), Greenhouse (cello), Makanowitzky (violin)
Fall and Spring, 1 or 2 credits each semester
(Credit is repetitive and may be extended to 14 credit hours over a four-year period, with the permission of the Department Chairman)

Music 103. Instrumental Ensemble

One or two three-hour weekly sessions devoted to reading and rehearsals of works drawn from the repertory of music for appropriate instruments.
Prerequisite: Permission of instructor.

Staff — Fall and Spring, 1 or 2 credits each semester

Music 112. University Chorus

Open to all students. Study and performance of a repertory from the Middle Ages to the present. Credit is optional and begins in the second year, with up to two credits allowed. More than three unexcused absences from rehearsals eliminates credit. Meeting three hours per week.
Prerequisite: Auditions.

Mr. Orton — Fall and Spring, no credit or 1 credit per semester

Music 121. Fundamentals of Music I

Sight reading, sight singing, notation, rhythmic and melodic dictation, intervals, the construction of scales.
Prerequisite: Ability to read music and permission of instructor.

Mr. Lessard — Fall, 3 credits

Music 122. Fundamentals of Music II

Continuation of Music 121. The formation of chords on the different degrees of the scale and their functions. Harmonic analysis of music from the Classical through the Romantic periods.
Prerequisite: Music 121, or permission of instructor.

Mr. Lessard — Spring, 3 credits

Music 221. Harmony I

The traditional use of triads and the seventh chords in all positions. Exercises in four-part harmony with figured and unfigured basses. Elementary keyboard harmony.

Prerequisite: Music 122, or permission of instructor.

Mr. Lessard — Fall, 3 credits

Music 222. Harmony II

Harmonization of melodies, modulation, and use of sequences; continuation of keyboard harmony. Introduction to post-classical harmonic procedures.

Prerequisite: Music 221, or permission of instructor.

Mr. Lessard — Spring, 3 credits

Music 233. Introduction to Opera

This course will seek to examine single works from the most significant operatic composers and will attempt to define the changing relationships between words and music, between voice and orchestra, and between one concept of drama and another. Representative works from Monteverdi to Stravinsky will be heard and sections of them will be analyzed as carefully as time permits. General operatic conventions, as well as each composer's individual realization of them, will be discussed.

Prerequisite: Ability to read music and permission of instructor.

Mr. Bonvalot — Fall, 3 credits

Music 235. Counterpoint I

Construction of melodic lines. The study of the principles of counterpoint through written exercises in two or three parts, all species.

Prerequisite: Music 222, or permission of instructor.

Mr. Lessard — Fall, 3 credits

Music 236. Counterpoint II

Written exercises in four parts, all species and combinations of species. Extended application of contrapuntal principles.

Prerequisite: Music 235.

Mr. Lessard — Spring, 3 credits

Music 237. The Music of Europe Before 1600

From the monophonic arts of the Early Middle Ages to the polyphonic ones of the Late Renaissance.

Prerequisites: Music 122, or permission of instructor.

Mr. Bonvalot — Fall, 3 credits

Music 238. Contemporary Music

The music of Schoenberg, Weber, Berg, Stravinsky, Varese will be analyzed. Emphasis will be placed on the 20th century as part of the unbroken historical continuum including changing concepts and practices, with a pertinent consideration of "Dissonance", and the repproachment of "Jazz" and "Serious Music".

Prerequisite: Ability to read music and permission of instructor.

Mr. Nemiroff — Spring, 3 credits

Music 240. The Music of Europe from 1600 to 1830

The dates of Peri's *Euridice* and Schumann's *Opus 1* establish the limits of a study that embraces the Baroque and Classical eras.

Prerequisite: Music 237, or permission of instructor.

Mr. Bonvalot — Spring, 3 credits

Music 321. Form and Analysis

Principles of musical construction. The components of Harmony, Counterpoint, Rhythm, and thematic development as integral forces in the growth of a form. The changing concepts in the use of Tonality and the resultant changing forms. The problem of continuity. Analysis of pertinent literature.

Prerequisite: Music 222, or permission of instructor.

Mr. Nemiroff — Fall, 3 credits

Music 322. Orchestration

The instruments of the classical orchestra. Their ranges and transpositions, and technical possibilities. Introduction to orchestration of dynamics through doublings and mixtures of various timbres. Arrangement of simple piano pieces for small combinations.

Prerequisite: Music 236, or permission of instructor.

Mr. Nemiroff — Spring, 3 credits

Music 323. Music After 1830

The combination in the nineteenth century of tradition and experiment will serve not only to extend the musical perspectives of the past but also to introduce as the second aim of the course, those of the present day.

Prerequisite: Music 240, or permission of instructor.

Mr. Bonvalot — Fall, 3 credits

Music 326. Tonal Counterpoint

This course is a study of the art of combining voices under the conditions of Tonal Harmony as observed in the works of Bach through the composers of the Romantic period. It includes the analysis of pertinent

literature and the writing of original exercises demonstrating the various principles and elements.
Prerequisite: Music 222, or permission of instructor.
Mr. Nemiroff Spring, 3 credits

III. Requirements for the Major in Drama and Theater

In addition to the general University requirements for the Bachelor of Arts degree, the following courses are required for the major in Drama and Theater.

A. Study within the area of the major

1. Theory (Theater 131, 132, 231, 331) 12 credits
2. History 12 credits
3. Techniques (Theater 232, 236) 6 credits

B. Courses in related areas

1. Electives in Music and Art 6 credits
2. Electives in English and/or foreign dramatic literature including a three credit course in Shakespeare 6 credits

C. Comprehensive Examination

During the senior year all drama and theater majors must pass a departmental examination on certain aspects of the theory and history of drama and theater. The faculty will select a set list of books covering these fields.

D. Departmental Requirements

All Drama and Theater majors are required to participate in at least two University Theater productions in at least two different capacities.

Courses in Theater

Theater 131. The Nature of Drama

The fundamentals of dramaturgy: The elements of drama, dramatic composition, the elements of plot, characterization, dramatic language, and the relation of drama and audience.
Prerequisite: None.
Mr. Holt Fall, 3 credits

Theater 132. Drama on Stage

A continuation of Theater 131. General dramaturgical analyses derived from specific examples of significant drama. A reading of great plays from world drama in connection with available records of theatrical productions.

Prerequisite: Theatre 131, or permission of instructor.

Mr. Holt — Spring, 3 credits

Theater 133. Voice and Diction

An introductory course devoted to those elements of voice production and "diction" essential to an understanding of the crafts of acting and the oral interpretation of literature. The course incorporates pertinent descriptive linguistic data in the approach to American "sounds".

Prerequisite: None.

Mr. Holt — Fall, 3 credits

Theater 231. Theory and Methods of Acting

An introductory study to the psychology of acting. Approaches and practices in characterization: Sensibility, observation, the fundamentals of stage speech and movement, imagination, pantomime, and improvisation.

Prerequisite: Theater 132, or permission of instructor.

Messrs. Holt, Newfield — Fall and Spring, 3 credits each semester

Theater 232. The Fundamentals of Technical Theater

A lecture-laboratory course in the planning, construction, and handling of stage scenery and properties. A survey of the modern methods of lighting various types of theatrical productions.

Prerequisite: Theater 132 or permission of instructor.

Mr. Howarth — Fall and Spring, 3 credits each semester

Theater 233. World Drama I

A survey of the development of drama from the Classical through the Renaissance periods. Parallel developments in the drama of the Eastern civilizations are also taken into consideration.

Prerequisite: Theater 132, or permission of instructor.

Mr. Newfield — Fall, 3 credits

Theater 234. World Drama II

A survey of the development of world drama from the 17th through the 19th centuries. (A continuation of Theater 233.)

Prerequisite: Theater 233, or permission of instructor.

Mr. Newfield — Spring, 3 credits

Theater 236. Stage Costume and Makeup

An introduction to the history and aesthetics of stage costumes and makeup. The fundamentals of costume design and the basic techniques of makeup.

Prerequisite: Theatre 231, or permission of instructor.

Mr. Howarth — Spring, 3 credits

Theater 330. Theory and Methods of Directing

Both a historical and technical approach to the function of the director in the production of a play. The course includes practical considerations of play selection, the synthesizing of the several elements of a play in performance, planning settings, properties, stage movement, and the interpretative requisites of dramatic language for the actor.

Prerequisites: Theatre 231 and 232 or 236.

Mr. Newfield — Spring, 3 credits

Theater 331. Stage Design

Perspective and mechanical drawing for the stage. Principles of designing for the theater, including color composition. These techniques are related to the aesthetics both of dramatic composition and the flexibility of modern staging.

Prerequisite: Theater 232, or permission of instructor.

Mr. Howarth — Fall, 3 credits

Theater 342. Drama and Theater in the Twentieth Century

A survey of the stylistic development of the theater arts (including opera, ballet, and the musical) in the 20th century with special emphasis on the work of the leading theoreticians and practitioners of the international theater.

Prerequisite: Theater 233, or permission of instructor.

Mr. Newfield — Spring, 3 credits

Department of Foreign Languages and Literatures

Professors: Seymour L. Flaxman (Chairman and Director of Language Laboratories), Oscar A. Haac

Associate Professors: Linette F. Brugmans, Herman Iventosch

Assistant Professors: Harriet R. Allentuch, Russell E. Brown, Anthony R. Hippisley, Nuci Kotta, Leonard R. Mills, Benkt Wennberg

Instructors: Demetrius Basdekis, Carol K. Blum, Alfred Ehrenfeld, Laurence J. Kabat, Daniel C. O'Neil, George W. Rose, Barry J. Rubin, Ferdinand A. Ruplin, Robert D. Sloan, Jr., Nora R. Spielmann

Requirements for the Major in Foreign Languages and Literatures

In addition to the general requirements for the Bachelor of Arts degree, the following courses are required for the major in Foreign Languages and Literatures:

A. Study within the area of the major

1. 18 semester hours in one foreign language in courses numbered 300 or above.
2. All students who major in a foreign language will be required to achieve proficiency in a second foreign language.

B. Courses in related areas

18 semester hours in related courses with the approval of the departmental adviser.

C. Teaching certification

Students who wish to prepare for certification as secondary school teachers must take the courses in education required for certification in addition to Sections A and B. They will also be required to earn 6 credits in a conversation and composition course in the language they intend to teach. The 3 credits of the methods and Materials in the Teach-

ing of Foreign Languages and the 12 credits of a second foreign language may, at the discretion of the Department, be counted toward the fulfillment of the related field requirements.

Courses in French

French 111, 112. Elementary French

An introduction to spoken and written French, stressing pronunciation, speaking, comprehension, reading, and writing. Selected texts will be read. Practice in the language laboratory supplements class work.
Prerequisite: None.

Mr. Mills and Staff — Fall and Spring, 3 credits each semester

French 211, 212. Intermediate French

An intermediate course in the reading and interpretation of French texts, with a review of French grammar, composition, and conversation. The student gains an acquaintance with the various literary genres through examples drawn from representative French authors. Work in the language laboratory will further develop audiolingual skills.
Prerequisites: French 111, 112, or equivalent.

Mr. Wennberg and Staff — Fall and Spring, 3 credits each semester

French 221, 222. French Conversation and Composition

This is a course in the active use of spoken and written French. At least one hour per week of work in the language laboratory is required. This course may be taken concurrently with or following French 211, 212.
Prerequisites: French 111, 112, or equivalent.

Mrs. Brugmans and Staff — Fall and Spring, 3 credits each semester

French 321. Advanced French Conversation, Phonetics, and Diction

A course designed to develop mastery of the spoken language. Students will learn to express themselves in the current idiom with fluency and accuracy. At least two hours of weekly laboratory practice will be required.
Prerequisites: French 221, 222, or junior or senior standing, and the permission of the instructor.

Mrs. Brugmans — Fall, 3 credits

French 322. Advanced French Grammar and Composition

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: French 221, 222, or junior or senior standing, and the permission of the instructor.

Mrs. Brugmans — Spring, 3 credits

French 331, 332. Major Writers in French

Reading and interpretation of selected works by great French writers from the Middle Ages to the present day. These works are treated in the context of the history of French literature, so that the student is prepared for further literary study. This course is conducted partly in French.

Prerequisites: French 211, 212, or equivalent.

Mrs. Allentuch, Mr. Wennberg

Fall and Spring, 3 credits each semester

French 335, 336. French Literature in the 17th Century

Reading of selected masterpieces from *Le Grand Siècle*. The study of classicism and of the main literary genres of the period will be included.

Prerequisites: French 331, 332, or equivalent.

Mrs. Allentuch — Fall and Spring, 3 credits each semester

French 337, 338. French Literature in the Eighteenth Century

Reading of selected works from representative authors of the main literary genres of the eighteenth century, including the *philosophes* and their forerunners. Attention will also be given to the development of the drama and the novel.

Prerequisites: French 331, 332, or equivalent; French 337 is a prerequisite for French 338.

Mr. Haac — Fall, 3 credits each semester

[French 341, 342. 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, Verlaine, Valéry, Apollinaire, St. John Perse, and others, with explication of individual poems.

Prerequisites: French 331, 332, or equivalent.

Fall and Spring, 3 credits each semester

To be offered 1966-67.

[French 345, 346. Modern French Fiction]

Critical reading and interpretation of French fiction in the 20th century, with emphasis on the work of such masters of French prose as Proust, Gide, Malraux, Sartre, Camus.

Prerequisites: French 331, 332, or equivalent.

Fall and Spring, 3 credits each semester

To be offered 1966-67.

[French 361, 362. Nineteenth Century French Literature]

The various *genres* will be examined through the works of the century's greatest writers. Critical readings and discussion of Romanticism, Realism, Symbolism, Naturalism.

Prerequisites: French 331, 332, or permission of the instructor.

Fall and Spring, 3 credits each semester

To be offered 1966-67.

Courses in German

German 111, 112. Elementary German

An introduction to spoken and written German, stressing pronunciation, speaking, comprehension, reading, and writing. Selected texts will be read. Practice in the language laboratory supplements class work.

Prerequisite: None.

Mr. Ruplin and Staff Fall and Spring, 3 credits each semester

German 211, 212. 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: German 111, 112, or equivalent.

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

German 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. May be taken concurrently with or following German 211, 212.

Prerequisites: German 111, 112, or equivalent.

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

German 331, 332. Major Writers in German

Reading and interpretation of selected works by great German writers from the Middle Ages to the present day. These works are treated in the context of the history of German literature, so that the student is prepared for further literary study. This course is conducted partly in German.
Prerequisites: German 211, 212, or equivalent.

Mr. Brown — Fall and Spring, 3 credits each semester

German 333, 334. Lessing and the Enlightenment

Reading and interpretation of the most important dramatic and critical works by Lessing. These will be studied in connection with the development of the Aufklärung, so that attention will also be given to certain works of Schiller, Goethe, and other German writers of the Eighteenth Century.
Prerequisite: German 333 is a prerequisite for German 334.

Staff — Fall and Spring, 3 credits each semester

[German 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.
Prerequisites: German 331, 332, or equivalent.

Fall and Spring, 3 credits each semester

To be offered 1966-67.

[German 341, 342. German Poetry since Holderlin]

A critical reading and analysis of the major German poets from Hölderlin to the present time, including a discussion of the significant schools and movements as represented in the work of such poets as Uhland, von Eichendorff, Rückert, Heine, Mörike, Meyer, von Liliencron, Spitteler, George, and Rilke.
Prerequisites: German 331, 332, or equivalent.

Fall and Spring, 3 credits each semester

To be offered 1966-67.

[German 345, 346. The German Drama from Kleist to Brecht]

Critical reading and analysis of the great German dramas from the beginning of the nineteenth century to the present, with attention to the development of such literary movements as Realism, Naturalism, and Expressionism.
Prerequisites: German 331, 332, or equivalent.

Fall and Spring, 3 credits each semester

To be offered 1966-67.

German 347, 348. The German Novel from Fontane to Hesse

A critical reading and analysis of the most important novels from the end of the Nineteenth Century to the end of World War II. Special attention will be given to the development of the modern German novel and to those literary movements that affect this *genre*.

Prerequisite: German 347 is a prerequisite for German 348.

Mr. Flaxman — Fall and Spring, 3 credits each semester

[German 351, 352. Schiller]

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

Prerequisites: German 331, 332, or equivalent.

Fall and Spring, 3 credits each semester

To be offered 1966-67.

Courses in Greek

[Greek 111, 112. Elementary Greek]

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

Staff — Fall and Spring, 3 credits each semester

To be offered 1966-67.

Courses in Italian

Italian 111, 112. Elementary Italian

An introduction to spoken and written Italian, stressing pronunciation, speaking, comprehension, reading, and writing. Selected texts will be read. Practice in the language laboratory supplements class work.

Prerequisite: None.

Mr. Mills — Fall and Spring, 3 credits each semester

Italian 211, 212. 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.

Prerequisites: Italian 111, 112, or equivalent.

Mr. Mills — Fall and Spring, 3 credits each semester

Courses in Latin

[Latin 111, 112. Elementary Latin]

An introduction to the Latin language, including the study of grammar, with reading and writing. Selections from Caesar and other authors will be read.

Staff — Fall and Spring, 3 credits each semester

To be offered 1966-67.

[Latin 211, 212. Intermediate Latin]

Reading and study of selected works by Cicero and other Latin authors.

Staff — Fall and Spring, 3 credits each semester

To be offered 1966-67.

Courses in Russian

Russian 111, 112. Elementary Russian

An introduction to spoken and written Russian, stressing pronunciation, speaking, comprehension, reading, and writing. Reading of selected texts will be included. Practice in the language laboratory supplements class work.

Prerequisite: None.

Mr. Rubin — Fall and Spring, 3 credits each semester

Russian 211, 212. Intermediate Russian

An intermediate course in the reading and interpretation of Russian texts, including a review of Russian grammar, composition, and conversation. The student gains an acquaintance with the various literary genres through examples drawn from representative Russian authors. Work in the language laboratory will further develop audiolingual skills.

Prerequisites: Russian 111, 112, or equivalent.

Mr. Rubin — Fall and Spring, 3 credits each semester

[Russian 221, 222. Russian Conversation and Composition]

A course in the active use of spoken and written Russian. At least one additional hour per week of work in the language laboratory is required. May be taken concurrently with or following Russian 211, 212.

Prerequisites: Russian 111, 112, or equivalent.

Mr. Rubin — Fall and Spring, 3 credits each semester

To be offered 1966-67.

Russian 331, 332. Major Writers in Russian

Reading and interpretation of selected works by great Russian writers. These works are treated in the context of Russian literature in the nineteenth century, so that the student is prepared for further literary study. This course is conducted partly in Russian.
Prerequisites: Russian 211, 212, or equivalent.

Mr. Rubin — Fall and Spring, 3 credits each semester

Russian 335. The Russian Short Story

Reading of selected short stories from Pushkin to the present. While the emphasis will be on literary values, linguistic problems will also be considered. This course is conducted partly in Russian.
Prerequisites: Russian 331, 332, or equivalent.

Fall, 3 credits

Russian 336. Pushkin

The reading and analysis of selected works by Pushkin, with emphasis on his poetry. This course is conducted partly in Russian.
Prerequisites: Russian 331, 332, or equivalent.

Spring, 3 credits

Russian 381. Nineteenth Century Russian Literature

Study of selected topics in Russian literature of the Nineteenth Century.
Prerequisites: Russian 331, 332 and one additional course in Russian literature.

Mr. Rubin — Fall, 3 credits

Russian 382. Twentieth Century Russian Literature

Study of selected topics in Russian literature of the Twentieth Century.
Prerequisites: Russian 331, 332 and one additional course in Russian literature.

Mr. Rubin — Spring, 3 credits

Courses in Spanish

Spanish 111, 112. Elementary Spanish

An introduction to spoken and written Spanish, stressing pronunciation, speaking, comprehension, reading, and writing. Selected texts will be read. Practice in the language laboratory supplements class work.
Prerequisite: None.

Messrs. Basdekis, Rose — Fall and Spring, 3 credits each semester

Spanish 211, 212. Intermediate Spanish

An intermediate course in the reading and interpretation of Spanish texts, with a review of Spanish grammar, composition, and conversation. The student gains an acquaintance with the various literary genres through examples drawn from representative Spanish authors. Work in the language laboratory will further develop audiolingual skills.

Prerequisites: Spanish 111, 112, or equivalent.

Messrs. Basdekis, Rose — Fall and Spring, 3 credits each semester

Spanish 221, 222. Spanish Conversation and Composition

This is 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. This course may be taken concurrently with or following Spanish 211, 212.

Prerequisites: Spanish 111, 112, or equivalent.

Fall and Spring, 3 credits each semester

Spanish 331, 332. Major Writers in Spanish

The reading and interpretation of selected works by great Spanish writers from the Middle Ages to the present day. These are treated in the context of the history of Spanish literature, so that the student is prepared for further literary study. This course is conducted partly in Spanish.

Prerequisites: Spanish 211, 212, or equivalent.

Mr. Iventosch — Fall and Spring, 3 credits each semester

Spanish 333, 334. Major Writers in Spanish America

The reading and interpretation of selected works by representative writers of Spanish America. This course is conducted partly in Spanish.

Prerequisites: Spanish 211, 212, or equivalent.

Fall and Spring, 3 credits each semester

[Spanish 335, 336. Spanish Literature in the Golden Age]

Reading and interpretation of selected works from the Golden Age of Spanish Literature, including *Don Quixote.*

Prerequisites: Spanish 331, 332, or equivalent.

Fall and Spring, 3 credits each semester

To be offered 1966-67.

Spanish 338. Spanish Poetry of the Golden Age

This course will offer an examination in depth of Spanish poetic literature from the late Middle Ages to the Baroque, from the Cancioneros to Gongora.

Mr. Iventosch — Spring, 3 credits

Spanish 361. Spanish Literature of the 18th and 19th Centuries

A brief glance at the Eighteenth Century will be followed by an examination of the major writers and movements of the Nineteenth, including Romanticism, Realism, Naturalism, and Modernism.

Mr. Iventosch — Fall, 3 credits

Other Courses

Foreign Languages 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.

Mr. Flaxman — Fall, 3 credits

Comparative Literature 346. The Modern European Drama

This course consists of a critical examination of the development of dramatic literature in Europe from Ibsen to Anouilh, including a comparative study of such movements as Naturalism, Neo-Romanticism, and Expressionism.

Prerequisite: The completion of at least two full courses in English literature, the third year of a course in a foreign language, or its equivalent, and senior standing.

Mr. Flaxman — Spring, 3 credits

[Comparative Literature 348. The Theory of Comparative Literature]

The Theory of Comparative Literature will view the field of comparative literature from various aspects in an attempt to give the student an understanding of what comparative literature study means and what it involves. This will include an examination of the leading theories of comparative literature.

Prerequisites: The completion of at least two full courses in English literature, the third year of a course in a foreign language, or its equivalent, and senior standing.

Spring, 3 credits

To be offered 1966 67.

Linguistics 301. Introduction to Linguistics

A course encompassing the theory of language from Panini to the present. Some time will be devoted to comparative and historical linguistics, but the emphasis will be placed on descriptive linguistics and applied linguistics in the classroom. The course will include practical descriptive work in the language laboratory.

Prerequisites: Junior or senior standing as a major in English or a foreign language.

Mr. Ruplin — Spring, 3 credits

Department of History

Professors: Stanley R. Ross (Chairman), Guillermo Céspedes, Bernard Semmel

Associate Professors: Hugh G. Cleland (Deputy Chairman), Werner T. Angress, Philip J. Staudenraus, Ruben E. Weltsch (Adjunct)

Assistant Professors: Per A. Ålin, Robert H. G. Lee, John W. Pratt, *Joel T. Rosenthal, Allan K. Wildman

Instructors: Karl S. Bottigheimer, Karl W. Demuth, Daniel Gasman

Requirements for the Major in History

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

A. Study within the area of the major

Completion of History 101, 102 and 24 additional credit hours of history, including the following:

1) A one-year course in American History, to be taken when possible in the sophomore year.

2) A one semester senior departmental seminar, either History 391 or 392 depending upon the student's interest.

3) Advanced courses, chosen in consultation with the adviser. It is recommended that all majors include some course work outside of the American and European fields.

B. Courses in related areas

Completion of 18 credit hours of courses outside the department, selected with the approval of the adviser and related to the student's field of interest in History. They will generally be in the social sciences and/or humanities.

Courses in History

Please Note: History 101 and 102 are open to all undergraduates; courses numbered from 150-199 are open to Sophomores and

* On leave for the Academic Year 1965/66.

above; courses numbered from 200-299 are open to Juniors and above; courses numbered from 300-399 are open to Seniors only.

History 101. The Rise of Western Civilization

A study of western society and ideas, emphasizing the development of major political, social and economic institutions, from Ancient Greece to the beginning of the French Revolution.

Staff — Fall and Spring, 3 credits

History 102. The Civilization of Modern Europe

A study of European ideas and institutions during the nineteenth and twentieth centuries: the French Revolution and Napoleon; the growth of industrialism and of democracy; the Marxist challenge and the Russian Revolution; the great world wars and the waning of European hegemony.

Staff — Fall and Spring, 3 credits

History 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.

Messrs. Cleland, Pratt, Staudenraus — Fall, 3 credits

History 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.

Messrs. Cleland, Pratt, Staudenraus — Spring, 3 credits

History 153. Latin America to 1825

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

Mr. Céspedes — Fall, 3 credits

History 154. Latin America Since 1825

The evolution of the Latin American nations since independence, with emphasis on political, economic and social problems.

Mr. Céspedes — Spring, 3 credits

History 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. Bottigheimer — Fall, 3 credits

History 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. Semmel — Spring, 3 credits

History 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. Lee — Fall, 3 credits

History 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 hundred years. Special attention will be given to the relationships between the United States and the Far Eastern countries.

Mr. Lee — Spring, 3 credits

History 201. Greek History to 323 B.C.

The origin, maturation and spread of classical Greek Civilization from its pre-historic and oriental origins through the death of Alexander the Great.

Mr. Ålin — Fall, 3 credits

History 202. Roman History to 300 A.D.

The development of the Roman Republic and Empire, with an emphasis upon the institutions which bound the Roman Mediterranean together and upon the Hellenistic Civilization of the Empire.

Mr. Ålin — Spring, 3 credits

[History 203. Medieval History, 300-1100]

European History is surveyed from the decline of Rome up to the Renaissance of the 12th Century. Special attention is paid to the Carolingian Empire, feudalism, the early Church and monasticism, and the Investiture struggle.

Mr. Rosenthal — Fall, 3 credits

To be offered 1966-67.

[History 204. The High Middle Ages, 1100-1400]

The High Middle Ages: The expansion of Europe (particularly the Crusades), the redevelopment of an urban civilization, and the origins of national states, secularism, and individualism are among the topics considered.

Mr. Rosenthal — Spring, 3 credits

To be offered 1966-67.

History 205. Early Modern Europe

The course surveys the "waning of the Middle Ages," the Renaissance and Reformation, the emergence of the institutions of the modern state, the political organization of Europe, the secularization of attitudes, and the influence of early modern science.

Mr. Weltsch — Fall, 3 credits

[History 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. Angress — Fall, 3 credits

To be offered 1966-67.

[History 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. Angress — Spring, 3 credits

To be offered 1966-67.

History 213. American Colonial Society

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 to the Revolution.

Mr. Pratt — Fall, 3 credits

History 214. Age of the American Revolution, 1760-1789

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.

Mr. Pratt — Spring, 3 credits

History 215. The Age of Jefferson and Jackson, 1789-1850

A study of the early national period of American History, which deals with the democratization of society, manifest destiny, and the rise of a national economy.

Mr. Staudenraus — 3 credits

History 216. Civil War and Reconstruction, 1850-1877

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. Staudenraus — 3 credits

History 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. Cleland — Fall, 3 credits

History 218. Recent U.S. History, 1929-1962

The Great Depression and the impact of Keynsian 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. Cleland — Spring, 3 credits

[History 223. Latin America and the Outside World]

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

Mr. Ross — Spring, 3 credits

To be offered 1966-67.

History 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.

Mr. Ross — Spring, 3 credits

History 225. Social History of Colonial Spanish America

A study on social structure, typologies, stratification and dynamics of the Spanish Colonies in the New World during the XVIth-XVIIIth Centuries, from the Conquistadores to the forerunners of Independence. Special emphasis will be given to inter-racial relations and social position of Indians, *mestizos* and *castas*.

Prerequisite: Junior standing.

Mr. Céspedes — Fall and Spring, 3 credits

History 233. Early Modern England: Reformation to Revolution, 1500-1640

An examination of the development of English society from the reign of Henry VIII to the eve of the great Civil War. Attention will be focused on the growth of the monarchy, the Reformation of the English Church, the dynamics of the Elizabethan era, the rise of the gentry, and the Parliamentary challenge of Stuart sovereignty.

Prerequisites: History 101, or 102, or 155, or permission of the instructor.

Mr. Bottigheimer — Spring, 3 credits

[History 234. Early Modern England: The Parliamentary Ascendancy, 1640-1800]

Beginning with the outbreak of the Civil War, this course will explore the Cromwellian decades, the Restoration of the monarchy, the Revolution of 1688, and the long century in which the unreformed Parliament dominated the political life of England.

Prerequisites: History 156, or permission of the instructor.

Mr. Bottigheimer — 3 credits

To be offered 1966-67.

[History 235. England during the Industrial Revolution, 1760-1860]

A social and economic analysis of the first century of the factory system in the first country to experience the industrial revolution; from the beginnings of industrialism to England's emergence as the "Workshop of the World".

Mr. Semmel — Fall, 3 credits

To be offered 1966-67.

[History 236. The Development and Structure of Modern Britain 1860 to the present]

This course will begin with an examination of Britain at the zenith of wealth and power and proceed to examine the effects of the traumatic

events of the twentieth century upon her position in the world and the structure of her society.

Mr. Semmel Spring, 3 credits

To be offered 1966-67.

History 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. Wildman Fall, 3 credits

History 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. Wildman Spring, 3 credits

[History 251. The Expansion of Europe 1415-1815]

A study of the expansion of Europe from the age of the great discoveries until the Congress of Vienna, including a survey of the diffusion of European civilization, the formation of empires and the rivalries among the colonial powers, and the processes of empire building during the age of mercantilism.

3 credits

To be offered 1966-67.

[History 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. Pratt Fall, 3 credits

To be offered 1966-67.

[History 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. Pratt Spring, 3 credits

To be offered 1966-67.

[History 273. Social & 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. Staudenraus 3 credits

To be offered 1966-67.

[History 274. Social & Intellectual History of the United States to 1865]

A study of the development of American institutions and thought in the years since the Civil War.

Mr. Staudenraus 3 credits

To be offered 1966-67.

History 285. Germany, 1806 to 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. Angress Fall, 3 credits

History 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. Angress Spring, 3 credits

History 391. Senior Seminar in United States History

Introduction to historical methods and problems in history; emphasis on discussion, oral and written reports, and a critical final paper.

Mr. Pratt Fall, 3 credits

History 392. Senior Seminar in European History

Introduction to historical methods and problems in history; emphasis on discussion, oral and written reports, and a critical final paper.

Staff Fall, 3 credits

Interdepartmental Courses in the Humanities

Humanities 103. The Classical Tradition

A study of major texts beginning with Homer, Sophocles, Herodotus or Thucydides, Ovid, Petrarch, Cervantes, and Shakespeare.

Staff 3 credits

Humanities 104. The Judaeo-Christian Tradition

A study of major texts from the Bible through the medieval period ending with Shakespeare. Focus will be on the Bible, St. Augustine, and Dante.

Staff 3 credits

Humanities 105. The Comic and Satiric Traditions

A course differentiating the aims of comedy and satire starting with an evaluation of comedy and satire in the twentieth century and then following a chronological line of the comic and satiric writers from Aristophanes to Günter Grass.

Staff 3 credits

Humanities 106. The Age of Enlightenment

A review of the phenomenon of the European Enlightenment, including an analysis of the forces in thought and literature that created the Age of Reason. Readings will include the works of such writers at Molière, Racine, Voltaire, Diderot, Leibniz, Lessing, Montesquieu, Goethe, and Richardson.

Staff 3 credits

Humanities 112. A Study of Larger Musical Forms

Discussion of elements of melody, harmony, counterpoint, rhythm, and form with emphasis on their function in the larger works of great composers. Music will be interpreted within a humanistic and musical framework. Selected works from the repertory of symphony, opera, and the concerto will be studied.

Staff 3 credits

Humanities 113. The Classical Tradition in Western Art

An analysis of the classical tradition in Western Art from the time of its birth in Greece through its survival and development in later antiquity, the Middle Ages, the Renaissance, and modern times, to its present aspects in "purist" art.

Staff 3 credits

Humanities 114. Music in Western Civilization

Examines 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.

Staff 3 credits

Humanities 115. The Forms and Traditions of Modern Theater

A course designed to introduce the general student to the nature of drama and theater in the modern world, to the basic elements of theater 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.

Staff 3 credits

Humanities 116. The Expressionist Tradition in Art

A careful exploration of expressionism, in the strictest sense a development in Northern European Art of the period ca. 1800–1919, will be followed by an examination of similar manifestations in the art of the more distant past. While the common denominators in terms of world view attitudes, and styles of the works considered will be carefully examined, care will be taken to acknowledge their individual differences.

Staff 3 credits

Humanities 121. 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 3 credits

Humanities 122. Modern Philosophic Classics

Readings and discussions of major philosophic texts of Renaissance and post-Renaissance philosophers such as: Machiavelli, Bacon, Hobbes, Descartes, Pascal, Spinoza, Locke, Hume, Diderot, Rousseau, and Kant.

Staff 3 credits

Humanities 123. Philosophic Classics: Major Issues

The focus is upon certain recurrent philosophic issues emerging from man's social, intellectual, religious and artistic experience in the traditions of Western civilization.

Staff 3 credits

Department of Mathematics

Professors: William G. Lister, Ernst Witt
Associate Professors: *William D. Barcus, (Acting Chairman), William C. Fox, Saul Kravetz, Donald Wehn, Eugene Zaustinsky
Assistant Professors: Harold Bell, Ross H. Cornell, Paul G. Kumpel, Jr., Chia-Hui Shih Kuo
Instructors: John Frampton, Ronald Hirshon

The undergraduate program in mathematics is designed to prepare the student for graduate study in mathematics, for secondary school teaching, or for certain positions in industry. The required courses provide a common core of instruction in the principal branches of mathematics, while the elective courses allow the student to improve his preparation for more specialized objectives.

Prospective graduate students should elect Mathematics 302 and 331.

Prospective secondary school teachers of mathematics should elect Mathematics 321 and 331.

It is recommended that the University language requirement be met in French, German or Russian. Many graduate schools require two of these three languages.

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:

Mathematics 102, 103, 155, 156, 201, 202, 232, 301
Mathematics 312 or *Mathematics* 323
Physics 101, 102, or 161, 162
Nine additional credit hours in mathematics courses numbered above 200.

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* On Leave for the Academic Year 1965-1966.

Courses in Mathematics

Mathematics 101. Elementary Functions

Relations, graphs, functions. Algebraic operations on functions. Analysis of rational, trigonometric and exponential functions. Two lectures and two recitations per week.

Fall, 3 credits

N.B. Mathematics 102, 103 is the normal freshman sequence for student whose major requires calculus. However, students whose preparation is considered insufficient will be required to take Mathematics 101.

Mathematics 102, 103. Calculus, I, II

Differentiation and integration of functions of one variable. First order differential equations. Infinite series, including Taylor's formula. Two lectures and two recitations per week.

Each course is offered in both semesters:
3 credits each semester

Mathematics 111, 112. Introduction to Mathematical Science

For liberal arts students who are not majoring in mathematics or science. The subject matter consists of topics in analytic geometry, calculus, modern algebra, and probability. The emphasis is on understanding rather than an expert mastery of techniques. However, representative simple problems are studied in detail.

Fall and Spring, 3 credits each semester

Mathematics 155. Calculus III

The linear algebra of real vectorspaces. Vector calculus of one real variable. Two lectures and two recitations per week.
Prerequisite: Grade of C or better in Mathematics 103.

Fall and Spring, 3 credits each semester

Mathematics 156. Calculus IV

Differentiation and integration of functions of several variables. Green's theorem. Existence theorems for solutions of differential equations. Linear differential equations with constant coefficients. Two lectures and two recitations per week.
Prerequisite: Mathematics 155.

Fall and Spring, 3 credits each semester

Mathematics 201, 202. Advanced Calculus

Elementary point set topology, the topology of metric spaces. Limits, continuity, mean value theorems. The operations of differentiation and integration, and their interchange with limits. The implicit function theorem. Surfaces, with an introduction to manifolds. Differential forms. Stokes' theorem. Change of variable in an integral.
Prerequisite: Mathematics 156.

Fall and Spring, 3 credits each semester

Mathematics 203. Topics in Calculus I

Ordinary and partial differential equations. Orthogonal systems of functions.
Prerequisite: Mathematics 156.

Fall, 3 credits

Mathematics 204. Topics in Calculus II

Functions of a complex variable: contour integration, conformal mapping and applications.
Prerequisite: Mathematics 156. May not be taken for credit in addition to Mathematics 301.

Spring, 3 credits

Mathematics 205. Probability and Statistics

A course in probability theory emphasizing the testing of hypotheses and attempting to reach significant statistical applications. Topics include the binomial, Poisson and normal distributions; several limit theorems for random variables; the elements of linear bivariate analysis; and selected types of tests and estimates.
Prerequisite: Mathematics 156.

Spring, 3 credits

Mathematics 232. Algebra I

The construction of the domain of integers, and the rational, real and complex number systems, leading to a consideration of the abstract algebraic structures represented by these systems; groups and rings, together with their homomorphisms and quotient structures; integral domains, particularly unique factorization domains and principal ideal domains; fields; and polynomial domains.
Prerequisite: Mathematics 155.

Fall, 3 credits

Mathematics 233. Number Theory

Congruences, quadratic residues, quadratic forms, continued fractions, Diophantine equations, number-theoretical functions, and properties of the prime numbers.
Prerequisite: Mathematics 155.

Fall, 3 credits

Mathematics 234. Linear Algebra

Vectorspaces over fields, linear transformations. The orthogonal and unitary groups, canonical forms for matrices. The spectral theorem. Multilinear algebra.
Prerequisite: Mathematics 232.

Spring, 3 credits

Mathematics 301. Introduction to Complex Analysis

Holomorphic functions. The Cauchy-Riemann equations, Cauchy's theorem. Taylor series. Maximum modulus theorem. Meromorphic functions, Laurent series, the Cauchy residue theorem.
Prerequisite: Mathematics 202.

Fall, 3 credits

Mathematics 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: Mathematics 202.

Spring, 3 credits

Mathematics 312. Introduction to Topology

Triangulated spaces and their simplicial homology. Singular homology, its properties and its relationship to simplicial theory. Fixed point theorems. The fundamental group and covering spaces.
Prerequisites: Mathematics 202, 232.

Fall, 3 credits

Mathematics 321. Geometric Structures

Projective, affine, Euclidean, and non-Euclidean geometries.
Prerequisite: Mathematics 232.

Spring, 3 credits

Mathematics 323. Introduction to Differential Geometry

Local theory of curves and surfaces in Euclidean space: fundamental forms, curvature, geodesics. Introduction to global differential geometry.
Prerequisite: Mathematics 202.

Spring, 3 credits

Mathematics 331. Algebra II

Elementary group theory: composition series, the Sylow theorems, the fundamental theorem of Abelian groups. Field extensions; the splitting field of a polynomial. The fundamental theorem of Galois theory.
Prerequisite: Mathematics 232.

Fall, 3 credits

Mathematics 341, 342. Independent Study in Special Topics

A reading course for upperclass students of exceptional ability. The topic is chosen by the student with the advice of a supervising member of the faculty, who will suggest appropriate sources. Weekly conferences are devoted to discussion of the material.

Prerequisite: Permission of the instructor.

Fall and Spring, 3 credits each semester

Graduate Courses

(For details see the *Graduate Bulletin*)

Real Analysis I, II
Complex Analysis
Algebraic Systems I, II
Algebraic Topology I, II
Differential Geometry
Riemannian Geometry
Lie Groups and Lie Algebras
Independent Study

Department of Philosophy

Professors: Sidney Gelber (Chairman), Robert Sternfeld, Harold Zyskind
Associate Professor: Walter Watson
Assistant Professors: Geoffrey A. Brogan, Paul W. Collins
Instructor: Donald F. Goodman, Doris E. Yocum

Requirements for the Major in Philosophy

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

A. Study within the area of the major

Two (2) semesters from any of the following courses:
Philosophy 151 (Ethics)
Philosophy 161 or 162 (Logic or Symbolic Logic)
Philosophy 211 (Problems of Esthetics)
Philosophy 237 (Theory of Knowledge)

Two (2) semesters of the following courses:
Philosophy 201 (Major Thinkers: Ancient and Medieval)
Philosophy 202 (Major Thinkers: Modern)

Two (2) semesters from the following:
Philosophy 391, 392 (Advanced Seminar)
Philosophy 393, 394 (Analysis of Philosophic Texts)

In addition: (a) Two (2) semesters from among any 200 courses, with the exception of Philosophy 201, 202, 211 and 237, and (b) two (2) semesters from among any 300 courses, with the exception of Philosophy 345, 346, 391, 392, 393 and 394.

B. Courses in related areas

Approved electives outside Philosophy (three semesters)

Courses in Philosophy

Philosophy 151. Ethics

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 works, and modern 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. Watson — Fall, 3 credits

Philosophy 161. Logic

The first course in logic concentrates on the subject-matter of logic in the strict sense, i.e., names, prepositions, and inferences, as these are treated by various logicians and used in various areas of knowledge.

Mr. Collins — Fall, 3 credits

Philosophy 162. Symbolic Logic

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: Philosophy 161.

Spring, 3 credits

Philosophy 201. Major Thinkers in the History of Philosophy: Ancient and Medieval

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.

Prerequisites: Two semesters in Humanities.

Fall, 3 credits

Philosophy 202. Major Thinkers in the History of Philosophy: Modern

Study of the writings of the major thinkers from Descartes to Kant on the problems of metaphysics and epistemology.

Prerequisites: Two semesters in Humanities.

Mr. Brogan — Spring, 3 credits

Philosophy 211. Problems of Esthetics

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.

Prerequisites: Two semesters in Humanities.

Mr. Zyskind — Fall, 3 credits

[Philosophy 213. Philosophy of Art]

Comparative study of various philosophies of art, with emphasis on their application to literature. Such authors are read as Plato, Kant and Croce.
Prerequisites: Two semesters in Humanities.

Mr. Zyskind — Fall, 3 credits

To be offered 1966-67.

[Philosophy 214. Philosophy of Literary Form]

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.
Prerequisites: Two semesters in Humanities.

Mr. Zyskind — Spring, 3 credits

To be offered 1966-67.

Philosophy 215, 216. Political Philosophy

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.
Prerequisites: Two semesters in Humanities.

Mr. Gelber — Fall and Spring, 3 credits each semester

Philosophy 220. Philosophy of History

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 Humanitites and one semester of History.

Messrs. Gelber, Zyskind — Spring, 3 credits

Philosophy 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.
Prerequisites: Two semesters in Humanities.

Mr. Goodman — Spring, 3 credits

Philosophy 235. Philosophy of Science

An inquiry into the function of philosophic principles in the natural sciences, with the focus on concepts such as space, time, casualty, and

life as they are treated in important philosophic and scientific works.
Prerequisite: One year of natural science.

Messrs. Collins, Eisenbud, Sternfeld, Watson — Spring, 3 credits

[Philosophy 237. Theories of Knowledge]

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: Philosophy 161.

Mr. Sternfeld — Fall, 3 credits

To be offered 1966-67.

[Philosophy 241. Philosophy of Rhetoric]

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.
Prerequisites: Two semesters in Humanities.

Mr. Zyskind — Fall, 3 credits

To be offered 1966-67.

Philosophy 301. Metaphysics

An inquiry into the first principles of all science, art, and action as these are treated in representative classical and modern authors.
Prerequisite: One semester of philosophy.

Miss Yocum — Fall, 3 credits

Philosophy 309. Logical Theory

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: Philosophy 161.

Mr. Sternfeld — Spring, 3 credits

Philosophy 310. Contemporary Philosophies of Experience

This course is a study of recent philosophies which have made important contributions to the study of the conpect of experience. Works from such thinkers as Dewey, Bradley, Husserl, James, Whitehead, Bergson, Sartre, Santayana, Heidegger, will be used.
Prerequisite: One semester of philosophy.

Mr. Sternfeld — Fall, 3 credits

[Philosophy 311. Contemporary Philosophies of Language]

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. Watson — Spring, 3 credits

To be offered 1966-67.

[Philosophy 312. Contemporary Value Theory]

Examination of the nature and status of value judgments, emphasizing problems of verification. Articles in contemporary literature by Frankenna, Lewis, Browning, Dewey, Hempel, Nagel, Scheffler, White, etc.

Prerequisite: Philosophy 151 or 237.

Miss Yocum — Spring, 3 credits

To be offered 1966-67.

[Philosophy 313. Existentialism]

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: One semester of philosophy.

Messrs. Brogan, Goodman — Fall, 3 credits

To be offered 1966-67.

Philosophy 315. American Philosophy

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: One semester of philosophy.

Mr. Gelber — Spring, 3 credits

Philosophy 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 Education 345, 346 (History and philosophy of Education.)

Prerequisite: Senior standing.

Messrs. Goodman, Sternfeld, Watson, Zyskind

Fall and Spring, 3 credits each semester

Philosophy 391, 392. Advanced Seminar

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: Two courses in Philosophy.

Staff

Fall and Spring, 3 credits each semester

Philosophy 393, 394. Analysis of Philosophic Texts

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. Two semester, two credit hours per semester.

Prerequisites: Two courses in Philosophy.

Staff

Fall and Spring, 3 credits each semester

Physical Education

Assistant Professors: A. Henry von Mechow (Acting Director of Physical Education), B. Edson Decker, Mildred A. Wehrly, John Ramsey
Instructors: Barbara A. Hall, Robert B. Snider

Physical Education Requirement

Two semesters of Physical Education are required for graduation. This requirement may be met by the satisfactory completion of two semester courses in Physical Education, participation in intercollegiate or intramural sports, or by a combination of these three and is to be completed *after* the Freshman year. No credits or grades will be given for Physical Education courses.

Each student must earn a minimum of one hundred points which may be acquired as follows:

A. *Instructional Classes:*
50 points will be awarded for the satisfactory completion of each semester of an instructional class. Course participation will be graded on pass or fail.

B. *Intercollegiate Sports:*
25 to 50 points will be awarded for participation in an intercollegiate sport.

C. *Intramural Sports:*
10 points will be awarded *normally* for satisfactory participation in an intramural sport season.

Students may take courses in Physical Education beyond the two semester requirement without credit.

Courses in Physical Education

Physical Education 100, 101. Team and Individual Sports

Fall and spring courses designed to acquaint students with rules, practice techniques, skills, visual aids and officiating in various team and individual sports.

Both the men's and women's sections will consist of two sports each semester as scheduled by the Physical Education Office according to the availability of staff and facilities.

Selections will be made from among the following activities:

Men — touch football, soccer, basketball, volleyball, softball, baseball, wrestling, track, squash, handball, badminton, tennis, gymnastics, golf, physical-conditioning.

Women — field hockey, volleyball, basketball, softball, golf, archery, tennis, badminton, squash.

Staff — Fall and Spring, no credit

Physical Education 120. Basic Swimming

A course designed to equip students with basic swimming skills and knowledge at the non-swimmer and beginner levels.

Staff — Fall and Spring, no credit

Physical Education 121. Advanced Swimming and Diving

A course designed to equip the individual with advanced strokes and water skills including the fundamentals of diving.

Miss Hall — Fall, no credit

Physical Education 122. Senior Life Saving

This course will teach the skills of life saving and water safety, and provide the student with an opportunity to meet the requirements for Red Cross Senior Life Saving certification.

Miss Hall — Fall and Spring, no credit

Physical Education 123. Water Safety Instructor

This course is designed to help the student meet the requirements for certification as a Red Cross Water Safety instructor.

Professor von Mechow — Fall and Spring, no credit

Physical Education 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.

Miss Hall — Spring, no credit

Physical Education 130. Basic Modern Dance

A study of the fundamentals of modern dance, including an analysis of movement, conditioning techniques and simple compositional forms. (For women only)

Staff — Fall, no credit

Physical Education 131. Advanced Modern Dance

A study in modern dance composition with intensive experimentation in individual and group choreography. (For women only)

Staff — Spring, no credit

Physical Education 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. (For women only)

Miss Hall — Fall, no credit

Physical Education 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, no credit

Physical Education 140. Basic Gymnastics

A basic course covering the four olympic pieces: free exercise, un-even parallels, horse and balance beam. (For women only)

Miss Wehrly — Fall, no credit

Physical Education 141. Advanced Gymnastics

An advanced course covering the four olympic pieces, including adaptation of techniques in compositional performances. (For women only)

Miss Wehrly — Spring, no credit

Points for Intercollegiate Sports:

Basketball	50 points
Bowling	25 points
Crew: Fall	25 points
Spring	50 points
Cross-Country	25 points
Soccer	25 points
Track and Field	25 points

Interdepartmental Program in the Physical Sciences

The program leading to the Bachelor of Science in Physical Science is a joint undertaking of the Departments of Chemistry and Physics. It is designed primarily as proper preparation for a student intending to teach either chemistry or physics at the high school level. With the permission of the supervising committee, however, a student preparing for advanced work in certain other fields (e.g., medicine, patent law, technical administration, etc.) might also elect this program. The aim of the program is to provide a broader than usual, yet nonetheless substantial, introduction to the content, methods, and current directions of development of the physical sciences.

Requirements for the Major in Physical Science

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

Physics 101, 102 and *Physics* 151, 152

Chemistry 101, 102 and *Chemistry* 151, 152

Mathematics 102, 103 and *Mathematics* 155, 156

A grade of C or above in each of these courses is required unless the requirement is waived by the supervising committee.

Physics 351, 352, or an equivalent course in modern physics or chemistry approved by the committee.

One additional year of physics or chemistry, which may not be met by *Physics* 251, 252.

Certification Requirements

The following are New York State requirements for certification to teach a science at the secondary level:

Two years in the certified subject.

One year each in mathematics, biology, chemistry, physics, and earth science.

Eight hours in the theory and practice of education.

Eight hours in teaching methods and practice teaching.

To satisfy these requirements for certification in both chemistry and physics, a student must take the following courses in addition to the University requirements and major requirements:

Biology 101, 102 or an eight-hour biology equivalent acceptable to the committee

Physics 251, 252 (Earth Physics)

Education 201 (Human Development and Behavior)

Education 345, 346 (History and Philosophy of Education)

Chemistry/Physics 239 (Materials and Methods in Teaching Physical Science)

Education 350 (Practice Teaching)

Department of Physics

Professors: T. Alexander Pond (Chairman), Nandor Balazs, Max Dresden, **Leonard Eisenbud, Arnold M. Feingold, David Fox, Linwood L. Lee, Jr., Herbert R. Muether, John S. Toll, Chen Ning Yang

Associate Professors: Hong-Yee Chiu, Robert L. de Zafra, Guy T. Emery, Edward D. Lambe, Richard A. Mould, B. James Raz, Henry B. Silsbee, Clifford E. Swartz

Assistant Professors: Peter B. Kahn, Yi-Han Kao, Juliet Lee-Franzini

The undergraduate major in physics 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 specialty in physics of the Program in Physical Science.

A student intending to qualify for the Bachelor of Science in Physics should complete *Physics* 101, 102, 151, 152, and *Mathematics* 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 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. Able students with extraordinary preparation may accelerate this program sufficiently to allow inclusion of courses from the Department's graduate offerings in the senior year.

Requirements for the Major in Physics

In addition to the general University requirements for graduation, the following courses are required for the major in Physics:

Physics 101, 102 and 151, 152 *(General Physics)**
One year of Chemistry (commonly, General Chemistry)
Mathematics 102, 103 and 155, 156 *(Calculus)*

* In special circumstances students who have taken *Physics* 161, 162 instead of *Physics* 101, 102 and 151, 152, will be allowed to work for the Bachelor of Science in Physics. Permission of the Chairman of the Department of Physics is necessary before entering the junior year, and evidence of special proficiency may be required.

** On Leave for the Fall Semester 1965.

Physics 201, 202 *(Electromagnetic Theory)*
Physics 211 *(Thermodynamics, Kinetic Theory and Statistical Mechanics)*
Physics 212 *(Mechanics)*
Physics 235, 236 *(Junior Laboratory)*
Physics 341, 342 *(Modern Physics)*
Mathematics 203, 204 *(Topics in Calculus)*
Foreign Language: The proficiency requirement must be met in French, German, or Russian.

Courses in Physics

Physics 101, 102. General Physics

The first year of a two-year sequence designed to cover a broad range of topics in both classical and modern physics in a manner suited to the needs of students of the sciences and engineering. Basic theories in classical physics, including kinematics and dynamics of point particles and elastic continua, the interactions of charges and currents in vacuum, and geometrical and physical optics will be covered. Use is made of the differential and integral calculus, vector algebra, elementary vector calculus, and differential equations, which are studied in the corequisite courses in mathematics. The laboratory program introduces the student to elementary techniques and provides an opportunity for the observation of the phenomena on which theoretical conceptions have been built. Two lecture hours, one recitation hour, and one three-hour laboratory per week. Honors-section: One laboratory-recitation section of Physics 101, 102 will cover the lecture material with greater depth and will take up additional subjects. Admission to this honors-section will be by invitation of the Department.
Corequisite: Mathematics 102, 103.

Fall and Spring, 4 credits each semester

Physics 151. General Physics

A continuation of the work of Physics 101, 102. Topics studied include dynamics of systems of particles and of rigid bodies, thermodynamics, kinetic theory, electrical and magnetic properties of matter, laws of electromagnetism. Two lecture hours, one recitation hour, and one three-hour laboratory per week.
Prerequisite: Grade of C or better in Physics 101, 102.
Corequisite: Mathematics 155.

Fall, 4 credits

Physics 152. Introduction to Modern Physics

An introduction to the phenomena and the associated theoretical considerations which have led to our present understanding of atomic and

nuclear structure. The course also includes an elementary discussion of special relativity and some descriptive material on solid state and particle physics. Two lecture hours, one recitation hour, and one three-hour laboratory per week.
Prerequisite: Physics 151.
Corequisite: Mathematics 156.

Spring, 4 credits

Physics 153. Introduction to Modern Physics

An introduction to the phenomena and the associated theoretical considerations which have led to our present understanding of atomic and nuclear structure. The course also includes an elementary discussion of special relativity and some descriptive material on solid state and particle physics. Two lecture hours and one recitation hour per week.
Prerequisite: Physics 151 and approval of the Chairman of the Department of Physics and the student's major department.
Corequisite: Mathematics 156.

Spring, 3 credits

Physics 161, 162. Introductory Physics

A survey of general physics designed primarily for students in the College of Arts and Sciences whose subsequent studies will not require extensive use or further development of physical principles. Emphasis is placed on classical dynamics, electricity and magnetism, and on modern developments in atomic structure. The laboratory is devoted to exhibition of phenomena closely related to important physical concepts. The mathematical development is not as intensive as is that of Physics 101, 102, 151, 152. Two hours of lecture, one recitation hour, and one three-hour laboratory per week.

Fall and Spring, 4 credits each semester

Physics 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: Physics 151, 152 and Mathematics 155, 156, each with a grade of C or better or permission of the Chairman, Department of Physics.
Corequisite: Mathematics 203, 204.

Fall and Spring, 3 credits each semester

Physics 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:: Physics 151, 152 and Mathematics 155, 156, each with a grade of C or better, or permission of the Chairman, Department of Physics.

Corequisite: Mathematics 203.

Fall, 3 credits

Physics 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 Physics 101, 102. The Langrangian and Hamiltonian methods are then derived from the Newtonian treatment and applied to various problems.

Prerequisite: Physics 211, or permission of the Chairman.

Corequisite: Mathematics 204.

Spring, 3 credits

Physics 235, 236. Junior Laboratory

Primarily for majors in physics. The main emphasis is on electrical measurements, electronics and optics, supplementing the material presented in Physics 201, 202. Two three-hour laboratories per week.

Prerequisite: Junior standing.

Corequisite: Physics 201, 202.

Fall and Spring, 3 credits each semester

Physics 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 Chemistry 239.

Prerequisites: Physics 161, 162 or equivalent, Chemistry 101, 102, Mathematics 151, 152 or equivalent, and concurrent study of an intermediate course in either chemistry or physics.

Spring, 3 credits

Physics 241, 242. Electricity and Magnetism

Designed primarily for students in the physical science program, this course treats the basic phenomena and concepts in electricity and magnetism, leading to the formulation of Maxwell's equations. The course emphasizes applications to electric circuits, motors, instruments, generators, and electronics. Some work in physical optics is included. Three lecture hours and one three-hour laboratory per week.

Prerequisites: Physics 161, 162 or Physics 151, 152, and Mathematics 155, 156; or permission of the Chairman, Department of Physics.

Fall and Spring, 4 credits each semester

Physics 251, 252. Earth Physics

This course is designed primarily for students who plan to seek certification as teachers of science at the secondary level. One half of the course will be concerned with astronomy, astrophysics, and cosmology. The other half will be divided between the structure and geological history of the earth, and the nature and motions of the oceans and atmosphere. Laboratory work will cover practical problems in astronomy, geology, and meteorology. Three class hours and one three-hour laboratory per week.

Prerequisites: One year of college physics and one year of calculus, or approval of the instructor.

Fall and Spring, 4 credits each semester

Physics 341. 342. 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: Physics 201, 202, 211 and 212, and Mathematics 203, 204.

Fall and Spring, 3 credits each semester

Physics 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 functions. Three class hours per week.

Prerequisites: Physics 201, 202, 211 and 212, and Mathematics 203, 204, or permission of the Chairman of the Department of Physics.

Fall and Spring, 3 credits each semester

Physics 345, 346. Senior Laboratory

Primarily for majors in physics. A number of the historic experiments studied in Physics 341, 342 are duplicated, but with the aid of modern instrumentation. During the second term, a particular experiment receives sufficient concentration so that a professionally acceptable description and analysis of the results can be presented. Typical projects involve work in atomic and molecular spectroscopy, X-ray analysis of crystals, the photoelectric effect, measurement of short times and high velocities, particle detection, and radioactivity. The development of experimental technique in the areas of atomic and nuclear physics is emphasized. The student is expected to formulate plans for his own experiments, based on his reading in journals and reference works. Two three-hour laboratory sessions per week.

Prerequisites: Physics 235, 236 or permission of the Chairman.

Corequisites: Physics 341, 342.

Fall and Spring, 3 credits each semester

Physics 351, 352. Modern Physics

Primarily for students in the physical science program. A survey 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: Physics 241, 242.

Fall and Spring, 4 credits each semester

Physics 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

Physics 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

(For details see the *Graduate Bulletin*)

Analytical Mechanics
Electrodynamics
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: Martin B. Travis (Chairman), Jay C. Williams, Jr.
Associate Professors: Howard A. Scarrow, Ashley L. Schiff, Sanford A. Lakoff
Instructors: Frank E. Myers, Merton L. Reichler, Hebert H. Werlin

Requirements for the Major in Political Science

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

A. Study within the area of the major
Completion of 24 credit hours in political science including:

1) Introduction to *Political Theory, Comparative Government, American Government;*
2) A course in research methods in political science (either *Political Science* 391 or 392);
3) Advanced work, with the consent of the adviser, in courses which emphasize diverse current approaches to political science.

B. Courses in related areas
Completion of 9 credit hours in appropriate advanced courses in the social sciences and/or humanities, selected with the approval of the adviser. For Education majors *Social Science* 201, 202 and 211, 212 will most easily fulfill these requirements.

Courses in Political Science

Political Science 101. 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.

Messrs. Reichler, Schiff, Williams

Fall and Spring, 3 credits each semester

Political Science 102. Comparative Government

An introduction to the analysis of political systems with major examples being drawn from British, Western European, and Soviet systems. Comparison of these systems with each other and with that of the U. S. Emphasis upon the formal institutions of government as well as the dynamics of politics.

Messrs. Myers, Scarrow, Werlin

Fall and Spring, 3 credits each semester

Political Science 156. Introduction to Political Theory

The course will examine the treatment given perennial theoretical problems in political theory from Plato to Dewey and McIver. The main emphasis will be placed on such problems as (1) definition of the political community, (2) relation of political institutions to each other, to cultural states, to parts of the community, to varieties and aspects of human nature and to ethical norms, (3) the effect which methods of inquiry have on the definition of problems and relevant data.

Mr. Williams Fall and Spring, 3 credits each semester

Political Science 201. American Political Thought

An analysis of the major policy problems from the Revolution to the present, with the aim of discovering the prevading concerns, methods, and spirit of American thought in civic matters.

Mr. Williams Fall, 3 credits

Political Science 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. Williams Spring, 3 credits

Political Science 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.

Mr. Werlin Fall, 3 credits

Political Science 210. Politics of Tropical Africa

A study of traditional African society, the rise of African nationalism, the transition to independence, and the problems that have arisen since independence. Political parties in Africa, interest groups, local government, regional associations, public administration, political ideology, inter-African and foreign relations will be considered.

Mr. Werlin — Spring, 3 credits

Political Science 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, elections campaigns, and pressure group activity.

Mr. Scarrow — Fall, 3 credits

[Political Science 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. Scarrow — Fall, 3 credits

To be offered 1966-67.

Political Science 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. Myers — Spring, 3 credits

Political Science 220. International Relations

Introductory survey of the nation-state system, its characteristic forms and the principal forces making for conflict and adjustment. Application of various approaches to the study of international relations (decision making, capability analysis, game theory, field theory) to contemporary problems.

Mr. Travis — Spring, 3 credits

Political Science 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. Travis — Fall, 3 credits

Political Science 223. Latin America and the United States

Survey of the international relations of the Latin America 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. Travis — Fall, 3 credits

Political Science 224. Introduction to International Law

Case book approach to standard introductory course in international law, including the following topics: state jurisdiction and responsibility, individuals, international organization, use of force.

Mr. Travis — Spring, 3 credits

Political Science 230. American Constitutional Law

A study of the role of the modern Supreme Court within the political and governmental process; its relations with Congress, the Presidency, state and local governments, parties, and interest groups; and the Court's contemporary policy-making role in several areas — economic regulation, representation, race relations, censorship, religion in government, defendants' rights.

Mr. Reichler — Spring, 3 credits

[Political Science 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 political other 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.

To be offered 1966-1967 — Fall, 3 credits

[Political Science 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.

To be offered 1966-1967 Spring, 3 credits

Political Science 250. Bureaucracy and Public Administration

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, inovation, and responsibility.

Mr. Schiff Spring, 3 credits

Political Science 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. Schiff Fall, 3 credits

[Political Science 253. State and Local Government]

Roles of states in the federal system. Federal-state, inter- and intra-state relations, urbanization and the growth of metropolitan communities. Urban politics and decision making in selected policy areas.

Mr. Schiff Fall, 3 credits

To be offered 1966-67.

Political Science 391. Research Methods in Political Science: American Political Institutions

Contributions and limitations of several approaches to and methods of the study of American politics and government, e.g., those emphasizing historical and institutional development, those focusing on interest and power conflicts, those analyzing political decision-making, and those concentrating on behavioral and interdisciplinary data; and the values of each approach in the quest for valid generalizations and predictions.

Mr. Reichler Fall, 3 credits

Political Science 392. Research Methods in Political Science: Comparative Politics

Approaches to the study of political systems with emphasis upon comparative analytical schemes, and upon comparison of specific institutions and patterns of behavior. Attention will also be devoted to the development of the study of comparative politics, including methods and problems of cross-governmental (international and intranational) and cross-cultural comparison.

Mr. Scarrow — Spring, 3 credits

Department of Psychology

Professors: Harry I. Kalish (Chairman), Leonard Krasner
Associate Professor: Lewis Petrinovich, Marvin Levine
Assistant Professors: Elio Bruschi, Thomas J. D'Zurilla, Edward M. Eisenstein, Marvin R. Goldfried, Stanley J. Weiss

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 25 Units in Psychology
Psychology 101. *(General Psychology)*
Psychology 102. *(Learning and Motivation)*
Psychology 162. *(Statistical Methods in Psychology)*
Psychology 205. *(Experimental Psychology)*
12 credit hours in Psychology electives

B. Courses in related areas
The Department requires that students take 15 credits of courses related to psychology, such as:

Mathematics 102, 103 (Calculus I, II)

Philosophy 235 *(Philosophy of Science)*

Sociology 101, 102 *(American Dilemmas: Problems of Present Day Society and Culture; Culture, Person, Social Systems, Community)*

(It is possible for the student to substitute other courses with the approval of the departmental adviser.)

Courses in Psychology

Psychology 101. General Psychology

An introduction to psychology as the science of behavior, this course familiarizes the student with the major areas of behavior: conditioning, learning, perception, motivation, psychological development, personality,

and measurement. Stress is placed on contemporary research. Prerequisite to all other courses in psychology.

Staff — Fall, 3 credits

Psychology 102. Learning and Motivation

A critical examination of the basic concepts, empirical findings, and theoretical interpretations in the experimental study of learning and motivation.

Prerequisite: Psychology 101.

Mr. Levine — Fall and Spring, 3 credits each semester

Psychology 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 nonparametric techniques. Two lecture sessions and a one-hour laboratory each week.

Prerequisites: Psychology 101, 102.

(Psychology 102 may be waived with permission of instructor.)

Mr. Kalish — Fall and Spring, 3 credits each semester

Psychology 205. Experimental Psychology

Application of the experimental method to the analysis of behavioral phenomena in human beings and animals. Design and execution of experiments, in conditioning, learning, perception, motivation, conflict, and certain selected personality problems. One lecture, one seminar and one two-hour laboratory period per week.

Prerequisites: Psychology 101, 102, and permission of the instructor.

Messrs. Petrinovich, Weiss — Fall and Spring, 4 credits each semester

Psychology 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.

Prerequisite: Psychology 101.

Mr. Goldfried — Fall, 3 credits

Psychology 209. Social Psychology

Behavior, and methods of studying behavior in groups and social situations will be considered. The topics will include communication, behavior in large and small groups, opinion and attitude measurement and change, and social interaction.

Prerequisite: Psychology 101 (possible prerequisite or corequisite Psychology 162).

Spring, 3 credits

Psychology 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. Prerequisite: Psychology 101, and permission of the instructor.

Spring, 3 credits

Psychology 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.

Prerequisite: Psychology 101, or permission of Department Chairman.

Messrs. Bruschi, D'Zurilla — Fall, 3 credits

Psychology 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.

Prerequisite: Psychology 101.

Messrs. Goldfried, Kalish, Krasner

Fall and Spring, 3 credits each semester

Psychology 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: Psychology 101 and Biology 101 or equivalent.

Mr. Eisenstein — Fall, 3 credits

Psychology 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.

Prerequisite: Advanced standing in Psychology and written permission of the faculty supervisor.

Staff — Fall and Spring, 1 to 3 credits each semester

Psychology 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

Psychology 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: Psychology 101, 102, and Biology 101, or equivalent.

Mr. Eisenstein — Spring, 3 credits

Psychology 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.

Mr. Petrinovich — Spring, 3 credits

Psychology 391, 392. Special Topics in Psychological Research and Theory

A seminar to be offered to advanced students only, 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: Psychology 101, 102, 162 and 205, and permission of the instructor.

Staff — Fall and Spring, 3 credits each semester

Interdepartmental Courses in Social Science

Social Science 201, 202. Topics in the Policy Sciences: Economic Development Programs and the World Struggle for Power

The themes to be treated include the spreading industrial revolution in the underdeveloped areas of the world and cultural tradition and social-political conflict in the modernization of the new nations. The political relations of the United States and the U.S.S.R. will provide the background of the readings and discussions. Either semester may be taken separately.

Staff — Fall and Spring, 3 credits each semester

Social Science 211, 212. Topics in the Cultural-Behavioral Sciences

An analysis of selected cultural institutions of modern complex societies with particular emphasis upon the wide-spread search for cultural and individual identity. The principal themes to be studied in the methods of contemporary socio-cultural analysis will be: (1) value-orientations in an era of scientific revolution, economic affluence, and political uncertainty; (2) the social organization of the "image industries" and other cultural enterprises.

Staff — Fall and Spring, 3 credits each semester

Social Science 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.

Staff — Fall, 3 credits

Social Science 381, 382. Problems and Methods in Social Theory and Social Science

Social Science 381 will emphasize problems in the scope and method of the policy sciences. Social Science 382 will emphasize problems in the scope and method of the cultural-behavioral sciences.

Prerequisite: Either semester may be taken concurrently with Social Science 201, 202, or 211, or subsequently. Social Science 382 may be taken prior to 381.

Staff — Fall and Spring, 3 credits each semester

Department of Sociology

Professors: ***Benjamin Nelson (Chairman), Kurt Lang
Assistant Professors: Abraham S. Blumberg, Norman Goodman
Instructor: Ned H. Polsky

Requirements for the Major in Sociology

In addition to the general University requirements for the Bachelor or Arts degree, and the successful completion of Sociology 101, 102, the following courses are required for the major in Sociology:

A. Study within the area of the major
Six courses listed below under Groups A, B, and C. *Sociology* 391-392 *(Senior Seminar);* one year of interdepartmental or related course work in Social Science.

Group A: Elements of Societies and Cultures
Sociology 151 or 152 *or permission of Department Chairman (Systematic Sociology: Principles, Methods and Perspectives)*

Group B: Social-Cultural Systems and Contemporary Social Trends
Sociology 203 through 249 *(Lectures and Discussions)*
Sociology 250 through 299 *(Reading and Research Tutorials)*

Group C: Theoretical and Research Methods in Historical Sociology
Sociology 201 *(Research Methods in Sociology)*
Sociology 361 *(Development of Contemporary Sociology)*
Sociology 362 *(Sociology Today)*

Sociology 151 or 152 or permission of the Department Chairman is a prerequisite for advanced work in the department. Majors are encouraged to complete this requirement at their earliest opportunity. A selection of two of the three courses in Group C is strongly recommended. Students expecting to complete requirements for certification as secondary school teachers in the Social Studies are

*** On Leave for the Spring Semester 1966.

urged to consult the departmental and education advisers at an early date.

The department recommends that the language proficiency requirement be ordinarily met in French or German, unless exception is granted by the Chairman or advisor.

Courses in Sociology

Sociology 101. American Dilemmas: Problems of Present Day Society and Culture

This course will explore with the aid of a wide variety of sources and methods the main value dilemmas and problems of the present day as they have been influenced by the contemporary revolutions in science, technology, communication, transport, organization, expectations, and cultural attitudes. Themes to be considered include: pressures in the direction of mass society, automation, the missile and space races, cultural homogenization, collectivistic controls, elites of experts, individual identity.

Staff — Fall and Spring, 3 credits each semester

Sociology 102. Culture, Person, Social System, Community

The topics to be explored from a structural-functional point of view include: patterns of culture; determinants of clan, caste, status, role, meaning, and social action systems; the social factors in the production and distribution of desired social values; the promise and paradoxes or collective effort and bureaucratic organization; the life-cycle of individual and group in industrial and non-industrial societies; cultural processes; the effects upon the sense of community of changes in the religious, scientific, and educational spheres.

Staff — Fall and Spring, 3 credits each semester

Sociology 151, 152. Systematic Sociology: Principles, Methods and Perspectives

This course will direct the attention of students to the central frames of reference, the productive techniques, and the unsolved problems of the scientific study of behavioral and cultural institutions, which has made giant strides in the last two decades.

Prerequisite: Sociology 101 or 102.

Staff — Fall and Spring, 3 credits each semester

Sociology 201. Research Methods in Sociology

An introduction to modern methods of social-cultural research, emphasizing the development of skills in the design and interpretation of a wide variety of research procedures.

Staff — Fall, 3 credits

Sociology 203. Social Systems and Community Patterns

A comparative analysis of stratification systems and community structures, with an examination of patterns of differentiation based on income, status, power, prestige, class; class consciousness and class conflict; influence and elite structures.

Staff — Fall, 3 credits

Sociology 207. Social Problems

This course explores the ways in which social definitions of social problems emerge and change. Stress will be placed upon the varying scope and intensity of social problems in shifting settings of economic scarcity and abundance, socio-cultural integration and dissension. The topics include poverty and affluence, dilemmas in organization of education, population imbalances, generational conflict, homicide and suicide, racial and ethic relations, structural and functional unemployment, prostitution and addiction.

Prerequisite: Sociology 151 or permission of instructor.

Mr. Polsky — Fall, 3 credtis

Sociology 209. Social Conflicts and Movements

An examination of aggregate phenomena: basic elements in social movements and conflict; conformity and deviant behavior in mass society; "revolutionary" and "counter-revolutionary" programs and organizations. Historical and cross-cultural illustrations will be stressed.

Staff — Fall, 3 credits

Sociology 236. Technology, Industrialization and Social Change

A comparative analysis of the interrelations between technological and social change, of technological and organizational preconditions of economic development, and of the social implications of automation in highly industrialized countries.

Staff — Spring, 3 credits

Sociology 238. Self, Society, Culture and Mental Health

A critical survey interpretation of the self, and its predicaments and powers in contemprorary society and social science. Ongoing sociological research on community mental health profiles and programs will be reviewed.

Mr. Goodman and/or Mr. Nelson — Spring, 3 credits

Sociology 239. Deviant Behavior and Juvenile Delinquency

Social and cultural factors in the rates and types of deviance and delinquency are carefully studied. The extensive recent research on the effects of social-cultural differentiations, generational rivalries, and invidious opportunities on the formation of juvenile gangs and bands is reviewed. Particular attention is paid to the *structural strains* prompting different groupings (age, sex, class, income, ethnic, educational groupings) to distinctive modes of deviant and delinquent behavior.

Prerequisite: Sociology 151 or permission of instructor.

Staff — 3 credit hours

Sociology 241. Social Psychology: Sociological Perspectives

The themes to be explored include: the influence of social and cultural factors on the personality development; group influences upon perception, memory, judgment, motivation, attitudes, the formation of social norms, communication processes, conformity, and deviance. Stress will be placed on the relations of theory and current research and experiment.

Prerequisite: Sociology 151 and Psychology 101 or permission of instructor.

Mr. Goodman — Fall, 3 credits

Reading and Research Tutorials: Sociology 250-299

Courses listed below as reading and research tutorials are open to selected juniors and seniors with the permission of the instructor and the Department Chairman. In each case, the course will emphasize critical source reading and research in selected areas of current interest to the staff.

Sociology 251. Work and the Professions

The world of work and the professions is examined with particular reference to inter-organizational conflict and accommodation.

Prerequisite: Sociology 151 or permission of instructor.

Mr. Blumberg — Fall, 3 credits

Sociology 256. Political Sociology

Stress will be placed on current research and unresolved problems in the spheres of power, authority, and legitimacy.

Prerequisite: Sociology 151 or permission of instructor.

Staff — Spring, 3 credits

Sociology 260. Comparative Social Structures and Institutions

A systematic study, with a strong historical emphasis, of the central institutions and social formations of the principal complex societies. In par-

ticular, highly industrialized nations such as the United States, Great Britain, Germany, and the Soviet Union will be compared with one another and with the newly developing states in respect to patterns of institutional persistence and change, emerging status-role and value conflicts.
Prerequisite: Sociology 151 or permission of instructor.

Staff — 3 credits

Sociology 262. Mass Communications

Particular attention is directed to the sociological patterns affecting recruitment of personnel, organization of services, and public functions of mass communication facilities.
Prerequisite: Sociology 151 or permission of instructor.

Mr. Lang — Spring, 3 credits

Sociology 263. Collective Behavior

Examination of major unstructured social phenomena (e.g., mob violence, panic, diffusion of fads and fashions, public opinion) as the outcome of collective problem-solving activity. The emphasis will be on a broad theoretical framework illustrated by case studies.
Prerequisite: Sociology 151 or permission of instructor.

Mr. Lang — Fall, 3 credits

Sociology 281, 282. Sociology of Organizations

This course will focus on structural features of organizational systems: chains of command, life-staff conflicts, organizational goals and performances, patternings of cooperation and conflict, status symbols, legal guarantees and grievance procedures.
Prerequisite: Sociology 151 or permission of instructor.

Mr. Lang and/or Mr. Nelson

Fall and Spring, 3 credits each semester

Sociology 283, 284. Social Roles and Role-Systems

Following a review of the extensive current sociological research on role, attention will be directed to alternative arrangements and functions of roles in historical, contemporary, and cross-cultural contexts.
Prerequisite: Sociology 151 or permission of instructor.

Mr. Goodman and/or Mr. Nelson

Fall and Spring, 3 credits each semester

Sociology 287. Sociology of Education

Stress will be placed on the following themes: the effects of social and cultural imperatives on the missions assumed by educational institutions; secondary schools and collegiate centers as social systems; the impact of the "knowledge revolution" on the changing definitions of educational facili-

ties; social-cultural patterns in the life-cycle of students and teachers; social-class and ethnic factors in educational developments.
Prerequisite: Sociology 151 or permission of instructor.

Mr. Lang — 3 credits

Sociology 361. Historical Development of Contemporary Sociology

A survey of the main currents in the development of theories and empirical investigation of society, culture, personality. The authors studied include Adam Smith, Hegel, Saint-Simon, Comte, Feuerbach, Marx, Maine, Spencer, Burckhardt, Tylor, W. R. Smith, Toennies, Durkheim, Dilthey, Simmel, Pareto, Freud.

Mr. Nelson — Fall, 3 credits

Sociology 362. Sociology Today

A review of the recent and contemporary advances in research, theory, and method in the field of sociology, especially in Great Britain and the United States. The authors studied include W. G. Sumner, T. Veblen, W. F. Ogburn, C. H. Cooley, G. H. Mead, R. E. Park, R. Linton, T. Parsons, R. K. Merton, C. Wright Mills, G. Homans, E. Goffman, K. Davis and others.

Mr. Nelson — Spring, 3 credits

Sociology 391-392. Senior Seminar in Sociology

Special topics, projects, and research papers.

Mr. Nelson and Staff — Fall and Spring, 6 credits

College of Engineering

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 fluid mechanics, solid mechanics, thermodynamics, electrical theory, applied analysis and properties of matter. In addition, the curriculum embraces broad training in the humanities, social 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 and by its nature seeks to avoid overtraining in existing engineering techniques and applications. A degree of specialization in particular engineering areas is provided in the senior year through elective courses and senior projects.

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.

Programs of graduate work with specialization in the various Engineering Departments are offered. (For further information see the *Graduate School Bulletin.*)

Requirements for the Bachelor of Engineering Degree

A student will be recommended by the Faculty for the degree upon completion of the requirements listed in sections 1, 2, and 3 below.

1. Required courses: Credit for, or exemption from, each of the following is required of all candidates:

Chemistry 103, 104	8 credits
English 101, 102	6 credits

Humanities	6 credits
Mathematics 102, 103, 155, 156	12 credits
Physics 101, 102, 151	12 credits
Social Science	6 credits
Physical Education	2 semesters

(Courses in Physical Education are to be completed *after* the Freshman Year.)

2. Elective requirement: 6 credits are normally required in the sophomore year in the areas of the humanities, (including foreign language courses numbered 150 and above), and the social sciences. An additional 6 credits are required in the senior year and can be taken in any area of study. With the approval of his academic adviser, a student may substitute the 7th-semester Open Elective for the 4th-semester Non-Technical Elective. In this case the Non-Technical Elective must be taken in the 7th semester.

3. Concentration requirement: Every student must meet the requirements of a program of concentration in Engineering Science approved by the Curriculum Committee of the College of Engineering.

4. Unless an alternate program is approved by the College of Engineering Curriculum Committee, every student admitted without advanced standing is required during the freshman year to register for:

   ESG 100, 101
   English 101, 102
   Two semesters of Humanities
   Mathematics 102, 103
   Physics 101, 102
   Two semesters of Social Science

   Courses to meet the Humanities requirement are to be chosen from the following:

   Humanities 103, 104, 105, 106, 112, 113, 114, 115, 116, 121, 122, 123.

   There is no prescribed sequence nor prerequisite for any of the Humanities courses except for Humanities 112.

Courses to meet the Social Science requirement are to be chosen from the following:

Anthropology 101, 102
Economics 101, 102
History 101, 102
Political Science 101, 102
Psychology 101, and any Psychology course for which the prerequisites have been fulfilled.
Sociology 101, 102

5. Exemptions: On the recommendation of the Chairman of the appropriate Department, a student is exempted without credit from any of the course requirements specified in sections 1 or 4 above.

Undergraduate Sequence

First Year

1st Semester	*Credits*	*2nd Semester*	*Credits*
ESG 100 Principles of Engineering I	1	ESG 101 Principles of Engineering II	1
English 101	3	English 102	3
Humanities	3	Humanities	3
Mathematics 102	3	Mathematics 103	3
Physics 101	4	Physics 102	4
Social Science	3	Social Science	3
	17		17

Second Year

1st Semester	*Credits*	*2nd Semester*	*Credits*
ESG 162 Introduction to Digital Computers	3	ESG 151 Graphic Arts	3
Chemistry 103	4	ESG 161 Mechanics I	3
Mathematics 155	3	Chemistry 104	4
Physics 151	4	Mathematics 156	3
Elective (Non-Technical)	3	*Elective (Non-Technical)	3
	17		16

Third Year

1st Semester	*Credits*	*2nd Semester*	*Credits*
ESG 221 Applied Analysis I	3	ESG 222 Applied Analysis II	3
ESG 251 Electrical Sciences I	3	ESG 252 Electrical Sciences II	3
ESG 232 Material Sciences I	3	ESG 233 Material Sciences II	3
ESG 263 Mechanics II	3	ESG 202 Thermodynamics II	3
ESG 201 Thermodynamics I	3	ESG 212 Engineering Laboratory II	4
ESG 211 Engineering Laboratory I	2		16
	17		

Fourth Year

1st Semester	*Credits*	*2nd Semester*	*Credits*
ESG 334 Material Sciences III	3	ESG 323 Applied Analysis III	3
ESG 364 Mechanics III	3	ESG 353 Electrical Sciences III	3
ESG 305 Heat and Mass Transfer	3	ESG 341 Engineering Design II	5
ESG 340 Engineering Design I	1	Elective (Technical)	3
Elective (Technical)	3	Elective (Open)	3
*Elective (Open)	3		17
	16		

* May be reversed with permission of adviser.

Courses of Instruction

Course designations are abbreviated according to the following scheme:

ESG:	Required Undergraduate Courses
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 Material Sciences
ESC:	Courses offered by the Department of Mechanics

The numbering of courses will indicate the year in which they are normally taken:

101–150: freshman courses
151–199: sophomore courses
201–299: junior courses
301–399: senior courses
401–499: graduate courses

Required Undergraduate Courses

ESG 100, 101. Principles of Engineering I, II

The purpose of this course is to acquaint the freshman engineering student with the type of problems that are encountered in modern engineering practice. Meetings will be devoted to classroom sessions concerning typical engineering problems, as well as lectures by the engineering faculty and outside lecturers from industry. Finally, every student will be required to prepare a brief essay on some general engineering topic.

1 credit each semester

ESG 151. Graphic Arts I

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.

Prerequisite: None.
Six laboratory hours.
To be offered both semesters.

3 credits

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 and Lagrange's formulation of the equations of motion.
Prerequisite: Physics 151.
Corequisite: Mathematics 156.

3 credits

ESG 162. Introduction to Digital Computers

An introduction to concepts of problem solving on a digital computer with emphasis on analyzing the problem, determining the solution process and coding the problem for solution on the digital computer. A problem oriented language (FORTRAN) serves as the communication medium. Fundamental concepts of computer logic are also introduced, with emphasis on computer organization, number representation, arithmetic operations, and the fundamental postulates of Boolean algebra.
Prerequisites: Sophomore standing and Mathematics 102, 103.
Two lecture hours, one laboratory hour.
To be offered both semesters.

3 credits

ESG 201. Thermodynamics I

An introduction to the concepts of energy, information, and states of matter with engineering applications is presented. The elementary concepts of information theory are considered as primitive and basic. The formalism of equilibrium statistical thermodynamics based on maximum uncertainty is developed from Shannon's equation for uncertainty. The classical, macroscopic equations of thermostatics (Zeroth, First, Second, and Third Laws) are derived from the formalism. The ideal monatomic gas, temperature, equations of state, and generalized thermodynamic property relationships by the method of Jacobians are considered.
Prerequisites: Mathematics 156, Physics 151, Chemistry 104.

3 credits

ESG 202. Thermodynamics II

The formalism developed in Thermodynamics I is applied to the open system, equilibrium and the grand potential function, chemically reactive systems, cycles, and an introduction to the thermodynamics of irreversible processes.
Prerequisite: Thermodynamics I.

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.
One lecture hour, six laboratory hours.
Prerequisite: Junior standing.

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.
One lecture hour, six laboratory hours.
Prerequisite: Engineering Laboratory I.

4 credits

ESG 221. Applied Analysis I

Analogues; modelling and normalization techniques; characteristic value problems with the use of matrices; transient analysis; Fourier series and Fourier transform; review of one-sided Laplace transform with use of tables for transform inversion; transforms of operations; solutions of linear differential equations and of simultaneous equations of this type; applications to various physical lumped systems.
The probability concept; sample spaces; distribution functions and density functions; random variables; expectation; variance; correlation.
Prerequisites: Mathematics 155, 156.

3 credits

ESG 222. Applied Analysis II

Formulation and classification of basic partial differential equations; the Laplace operator in generalized orthogonal coordinate systems; Laplace's equation. Poisson's equation, heat equation, and wave equation in x, y, z and t; telegrapher's equation in x and t. Boundary-value and initial-value problems; separation of variables; Sturm-Liouville problem; divergence theorem; Green's function. Use of Fourier series, Fourier transforms, and Laplace transform. Consideration of Bessel functions (first and second kind), Legendre polynomials, and Mathieu functions.
Review of complex numbers, functions of a complex variable, limits, continuity, differentiability, analytic functions, Cauchy-Riemann, harmonic functions, Cauchy's integral formula, Cauchy's integral theorem, Taylor's series, singularities, residues.
Prerequisite: Applied Analysis I.

3 credits

ESG 232. Material Sciences I: Introduction to Properties of Materials

A broad introduction to the scientific principles underlying knowledge of materials and their applications.

The course begins with an introduction to chemical thermodynamics, modern atomic theory, the periodic table and chemical bonds, the perfect crystal, the space lattice, unit cell, x-ray crystal structure determination, specific crystal structures, the imperfect crystal, dislocations, the basic concepts of phase transformation and phase diagrams. The course then continues with principles of electrochemistry, corrosion, colloids and high polymers.

Prerequisite: Physics 151.

3 credits

ESG 233. Material Sciences II: Electrical and Magnetic Properties of Materials

This course is designed primarily as an introduction to the modern theory of the electrical and magnetic properties of matter. Some of the topics discussed include the free electron theory of metals, the bond theory of solids (Brillouin Zone theory and applications), the conductivity of metals, the physics of semiconductors, pn junction theory, photoelectric, thermoelectric, magnetic and dielectric properties of matter.

Prerequisite: Material Sciences I.

3 credits

ESG 251, 252. Electrical Sciences I, II

These two courses together comprise a unified introduction to passive and active lumped circuit theory. Basic circuit concepts, theorems, and methods of analysis are developed first in terms of simple resistive circuits with d.c. excitation, then extended to encompass complex impedance and steady state response to single frequency excitation, then further extended to encompass periodic and transient excitation and response, and finally to encompass simple circuits containing ideal active and/or non-linear elements. Physical phenomena giving rise to the internal behavior of various solid state, vacuum and gas filled devices are discussed. Particular emphasis is given to the manner in which such internal behavior gives rise to externally observable terminal behavior, of how the terminal behavior may be approximated by combinations of ideal circuit elements, and of the practical procedures to be followed for analysis and design when the ideal model approximations are inadequate. Specific types of circuits such as filters, rectifiers, amplifiers and pulse circuits are singled out for illustrative examples.

Prerequisites: Mathematics 156, Physics 102.

Corequisite: Applied Analysis I.

3 credits each semester

ESG 263. Mechanics II: Mechanics of Solids

An introduction to the mechanics of engineering structures and the techniques used in analyzing such structures. Topics include: stress resultants and stress intensities; equilibrium and stability analysis of beams and trusses; elastic deformations due to axial forces and bending moments with emphasis on the conjugate beam method; energy principles including virtual work, Castigliano's Theorems, Betti's Law and Maxwell's Law; and an introduction to statically indeterminate structures with emphasis on the method of superposition, Conjugate Beam, and Virtual Work.
Prerequisite: Mechanics I.
Corequisite: Applied Analysis I.

3 credits

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 analyses of laminar and turbulent boundary layer flows are treated, as well as condensation and boiling phenomena. Thermal radiation, including the analogy between molecular and photon transport, is discussed. Radiation heat transfer between surfaces is treated, as well as the derivation and application of the radiation flux equation for absorbing-emitting media.
Prerequisite: Thermodynamics II.
Corequisite: Mechanics III.

3 credits

ESG 323. Applied Analysis III: Numerical Methods

Arithmetic of approximation; round-off error; significant figures. Polynomial approximation; interpolation and finite differences; least squares, orthogonal sets, Fourier-Bessel coefficients, Legendre polynomials, Fourier series; Tchebycheff approximation. Numerical solution of linear and nonlinear 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 nonlinear differential equations. Use of the computer in applying these numerical techniques.
Prerequisite: Applied Analysis II.

3 credits

ESG 334. Material Sciences III: Physical Properties of Matter

This course builds on the concepts presented in Material Sciences I and provides an introduction to the physical properties of matter. Among the

topics covered are: anisotropy in crystal structure; crystal imperfection theory; atomistic and bulk approach to elasticity, plasticity and fracture of solids.
Prerequisite: Material Sciences I.

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.

1 credit

ESG 341. Engineering Design II

Student groups carry out the detailed design of the senior projects chosen during the first semester. The finished report must be presented and defended before a faculty committee.

5 credits

ESG 353. Electrical Sciences III

The fundamentals of electromagnetic theory. The topics include: elements of vector analysis, Maxwell's equations, static fields, lumped circuit and field concepts, quasistatic fields and distributed constant, transmission lines, plane waves, guided waves radiation, wave guides and antennas.
Prerequisites: Applied Analysis II, Electrical Sciences II.

3 credits

ESG 364. Mechanics III: Mechanics of Fluids

Cartesian tensors, state of stress in a continuum, kinematics of fluids, the Newtonian fluid and constitutive equations for other fluids, the continuity equation, equation of motion, energy equation, entropy equation, fluid statics, flow of an ideal fluid, flow of a viscous fluid.
Prerequisites: Applied Analysis II, Mechanics II.

3 credits

Department of Applied Analysis

Professors: Irving Gerst (Chairman), Aaron Finerman (Director of Computing Center), Armen H. Zemanian
Associate Professors: Daniel Dicker, Devikumara V. Thampuran
Assistant Professors: Ronald A. Rohrer, Reginald P. Tewarson

Departmental Electives

ESA 316. Special Functions of Applied Analysis

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: Applied Analysis II.

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, theory of games, problems of strategy, decision making, etc.
Prerequisite: Applied Analysis I.

3 credits

ESA 321. Introduction to 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 hypotheses. 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: Applied Analysis I.

3 credits

ESA 322. Introduction to Stochastic Processes

An introduction to the study of random phenomena in engineering. Pertinent concepts such as random variables, probability distributions, mean values, characteristic functions, spectral density and stochastic processes are developed and applied to problems in noise theory, propagation through linear systems, information theory and quality control.
Prerequisite: Introduction to Applied Probability Theory.

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: Introduction to Digital Computers, Applied Analysis I.

3 credits

Department of Electrical Sciences

Professor: Sheldon S. L. Chang (Chairman)
Associate Professors: Richard B. Kieburtz, Velio A. Marsocci
Assistant Professor: Peter M. Dollard

Departmental Electives

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: Thermodynamics I, Electrical Sciences I and II, Mechanics I.

3 credits

ESE 317. Logic and Switching

The course introduces the basic principles of modern digital computer and automata technology. Topics covered will include propositional logic and Boolean algebra; canonical forms; applications to diode, relay and electronic switching networks; combinational circuits; sequential circuits; and special topics selected by the students. The latter might include unifunctional and multifunctional circuit design principles, digital computers, or automata.

3 credits

ESE 319. Transistor Circuit Analysis

An introduction to the use of transistors in electronic circuits. Among the topics will be: equivalent circuit representations, measurement of transistor parameters, small signal amplifiers, frequency and time-domain response functions, tuned r-f amplifiers, the use of feedback to improve performance, oscillators, large-signal amplifiers and switches, modulation and detection circuits. The course includes a laboratory on alternate weeks.

3 credits

ESE 335. Energy Conversion

Natural energy sources. Basic laws of energy conversion. Transport theory in gas and semiconductors. Operating principles, losses, and preliminary analyses of the electromechanical, magnetohydrodynamic, thermoelectric, thermionic, fuel cell, and photo-voltaic energy converters.

3 credits

Department of Material Sciences

Professors: Sumner N. Levine (Chairman), Leslie L. Seigle
Associate Professor: Joseph Jach
Assistant Professors: Kalinath Mukherjee, Robert Rosenberg

Departmental Electives

ESM 325. X-Ray Diffraction and Structure of Matter

The primary objective of this course is to provide a fundamental insight into crystal diffraction and application to structural studies. Laboratory work will be incorporated to illustrate measurement techniques. Included will be the following general topics: lattice scattering of x-ray radiation, structural defect scattering mechanisms and effects on diffraction patterns, structure identification, single crystal orientation studies including stereographic projection, and a survey of advanced modern techniques for use of x-ray diffraction as a research tool.
Prerequisite: Material Sciences I.

3 credits

ESM 326. Quantum Theory of Matter

Quantum mechanics has assumed a position of considerable importance in modern engineering. This course provides an introduction to the subject and considers applications to semiconductors, lasers, theory of electrical conduction and other relevant applications.
Prerequisites: Mathematics 156, Physics 151.

3 credits

ESM 327. Semiconductor Theory and Technology

A detailed discussion of the preparation and properties of semiconductors. The theory of thermal and electrical transport is developed in detail and applied to semiconductor electronic devices and thermoelectric devices. The photoelectric and Hall effects are then discussed and applied to measurement technique as well as to devices.
Prerequisite: Material Sciences II.

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 329. 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 simulation of biological systems.

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: Material Sciences I.

3 credits

Department of Mechanics

Professor: Walter S. Bradfield
Associate Professors: Robert D. Cess (Acting Chairman), Richard S. Lee, Edward E. O'Brien
Lecturer: Joseph J. Sheppard
Instructors: Joseph T. Pearson Jr., Arthur E. Sotak

Departmental Electives

ESC 366. Thermal Sciences & Fluid Mechanics Laboratory

Advanced projects in heat transfer, thermodynamics or fluid mechanics to be selected individually by the student or in collaboration with a staff member. The project will be carried out by individuals or small groups under staff supervision. Nine laboratory hours by arrangement.

3 credits

ESC 371. Compressible Fluid Mechanics

The general conservation equations of gas dynamics are derived from a differential and integral point of view. Hyperbolic compressible flow equations, unsteady one-dimensional flows, the non-linear problem of shock wave formation, isentropic plane flow, small perturbation theory, method of characteristics, and the hodograph method are considered as representative applications of the general equations.
Prerequisite: Thermodynamics II.

3 credits

ESC 372. Boundary Layer Theory

The Navier-Stokes equations and their subsequent reduction to the boundary layer equations are discussed. General properties of the boundary layer equations, conditions for similarity, exact solutions, and approximate methods are treated. The fundamentals of turbulent flow are discussed with application of the mixing length theories to turbulent boundary layers.
Prerequisite: Mechanics III.

3 credits

ESC 375. Continuum Fluid Dynamics

A discussion of the fundamental concepts and theorems of continuum fluid dynamics and a detailed formulation of the general conservation equations of the fluid field. The state, transport, and chemical kinetic properties of the fluid are introduced with their phenomenological coefficients. The mathematical features of the fundamental field equations

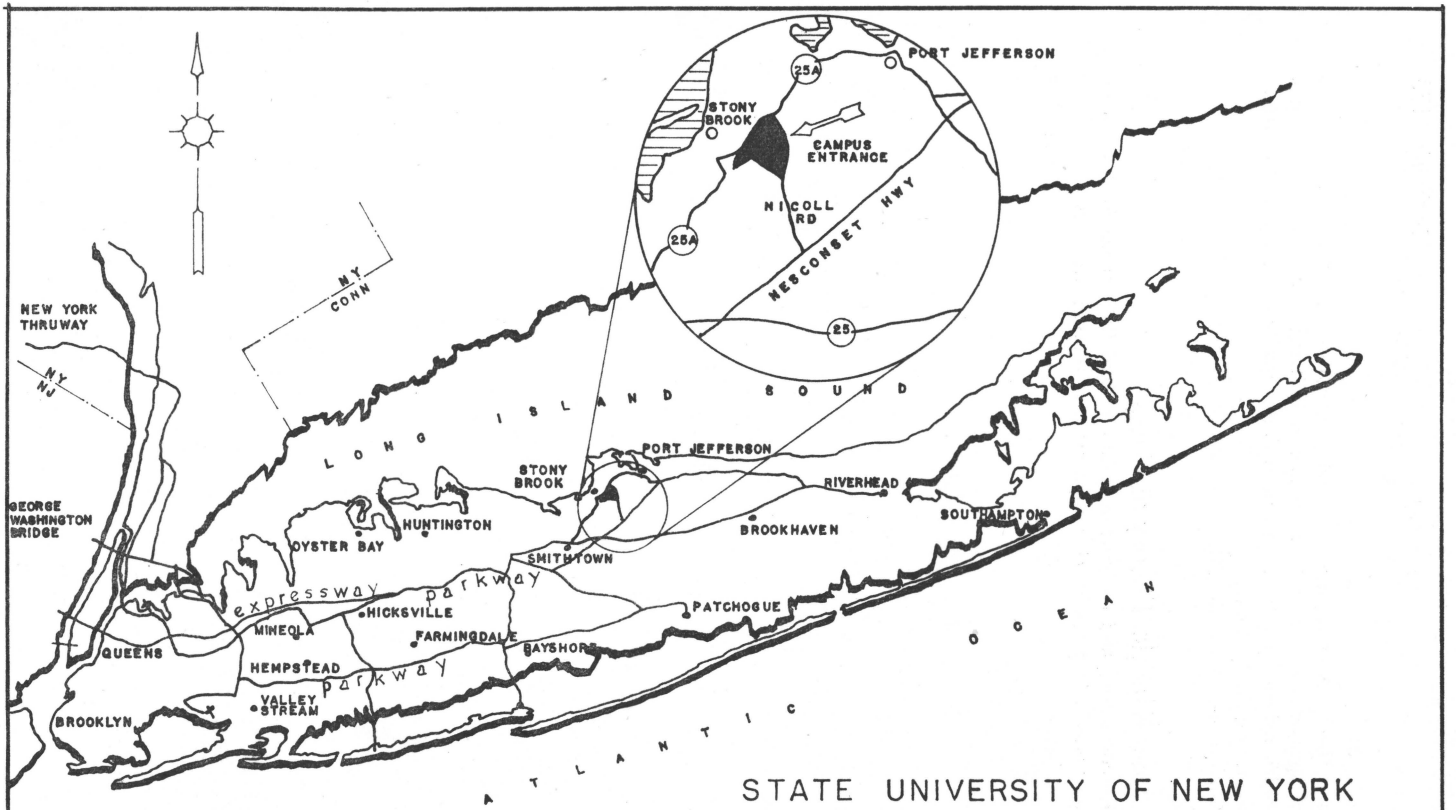
and the types of applicable boundary conditions are discussed. Examples of specific boundary conditions and simplifying assumptions are treated which reduce the general equations to the "starting equations" for various fields of fluid dynamics.
Corequisite: Mechanics III.

3 credits

ESC 399. Kinetic Theory of Gases

Kinetic theory and its basic applications (and limitations) to steady state phenomena in gases. Specific application to transfer processes.

3 credits



STATE UNIVERSITY OF NEW YORK
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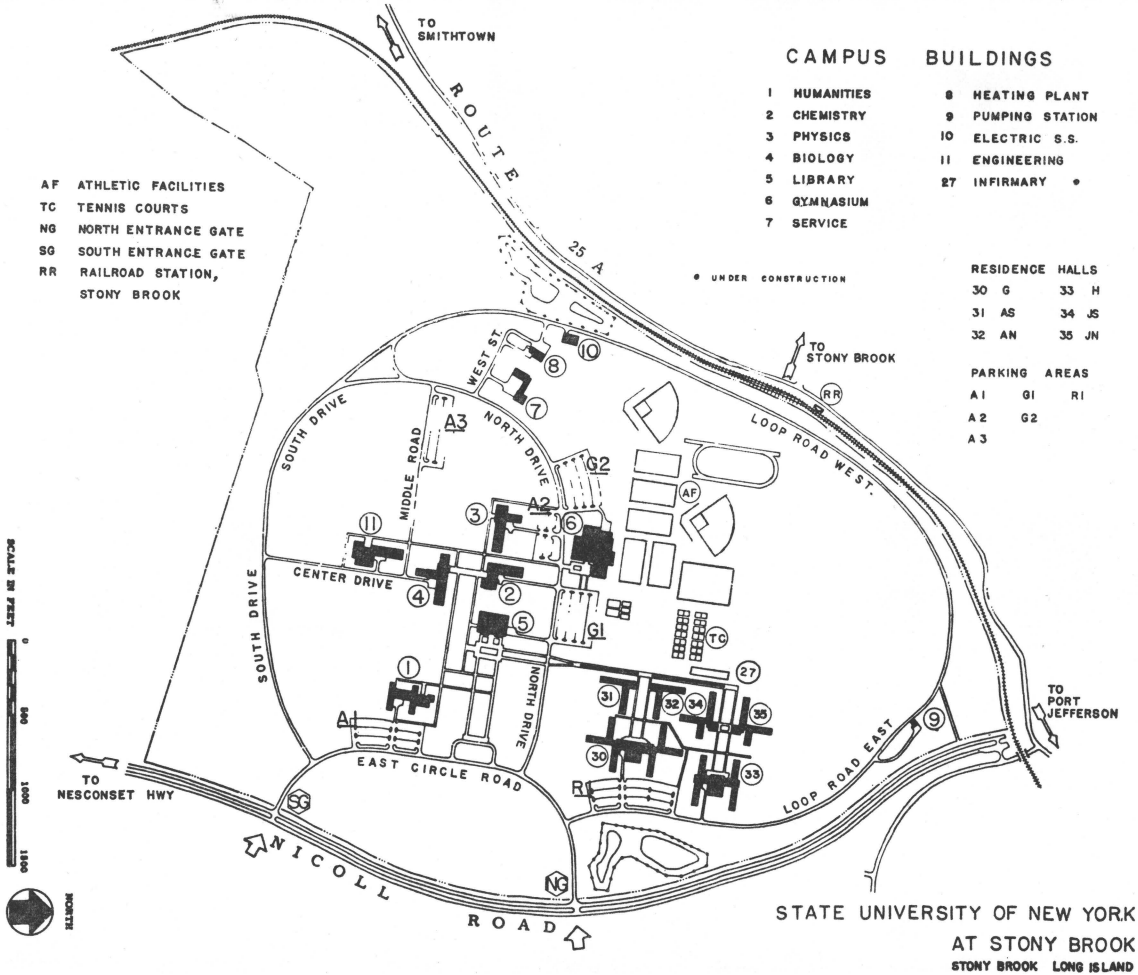

STATE UNIVERSITY OF NEW YORK
AT STONY BROOK
STONY BROOK LONG ISLAND

STATE UNIVERSITY OF NEW YORK

Central Administrative Office: Albany 1, N. Y.

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 (New York City)
Upstate Medical Center at Syracuse

COLLEGES OF ARTS AND SCIENCE

College at Brockport
College at Buffalo
College at Cortland
College at Fredonia
College at Geneseo
College at New Paltz
College at Oneonta
College at Oswego
College at Plattsburgh
College at Potsdam

SPECIALIZED COLLEGES

College of Forestry at Syracuse University
Graduate School of Public Affairs at Albany
Maritime College at Fort Schuyler (Bronx)
College of Ceramics at Alfred University
College of Agriculture at Cornell University
College of Home Economics at Cornell University
School of Industrial and Labor Relations at Cornell University
Veterinary College at Cornell University

TWO-YEAR COLLEGES

Agricultural and Technical Colleges at: Alfred, Canton, Cobleskill, Delhi, Farmingdale, Morrisville

COMMUNITY COLLEGES

(Locally-sponsored two-year colleges under the program of State University)

Adirondack Community College at Hudson Falls
Auburn Community College at Auburn
Borough of Manhattan Community College at New York City
Bronx Community College at New York City
Broome Technical Community College at Binghamton
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
Hudson Valley Community College at Troy
Jamestown Community College at Jamestown
Jefferson Community College at Watertown
Kingsborough Community College at Brooklyn
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 at Brooklyn
Niagara County Community College at Niagara Falls
Onondaga Community College at Syracuse
Orange County Community College at Middletown
Queensborough Community College at New York City
Rockland Community College at Suffern
Staten Island Community College at New York City
Suffolk County Community College at Selden
Sullivan County Community College at South Fallsburg
Ulster County Community College at Kingston
Westchester Community College at Valhalla