State University of New York

at Stony Brook

The Undergraduate Bulletin

1964 - 1965

State University of New York

THE STATE UNIVERSITY OF NEW YORK was established by the State Legislature in 1948. It comprises 58 units: three university centers, two medical centers, a Graduate School of Public Affairs, twenty-four State colleges (18 four-year and 6 two-year), 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 and business administration. 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 12 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 plans for the total development of State supported higher education. 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.
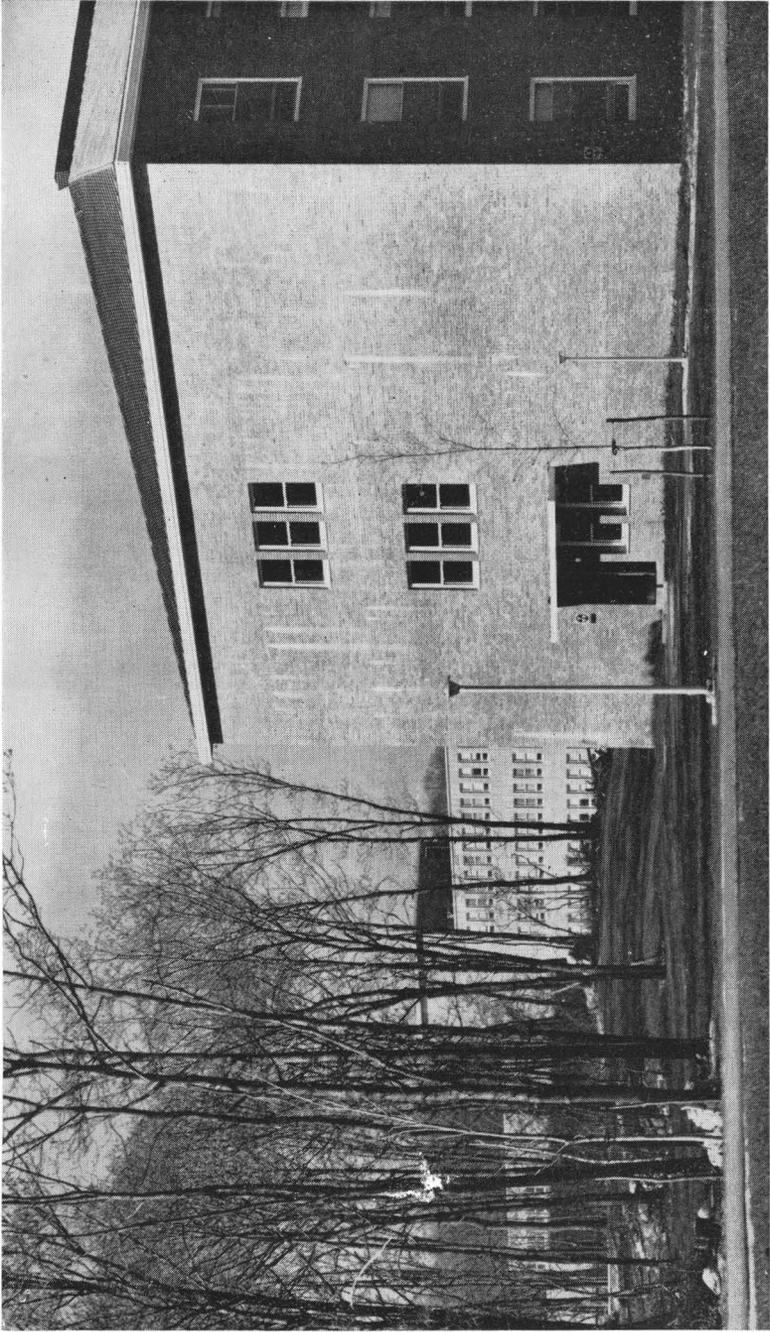
The State University motto is: *"Let Each Become All He Is Capable of Being."*

The Frank Melville Jr. Memorial Library
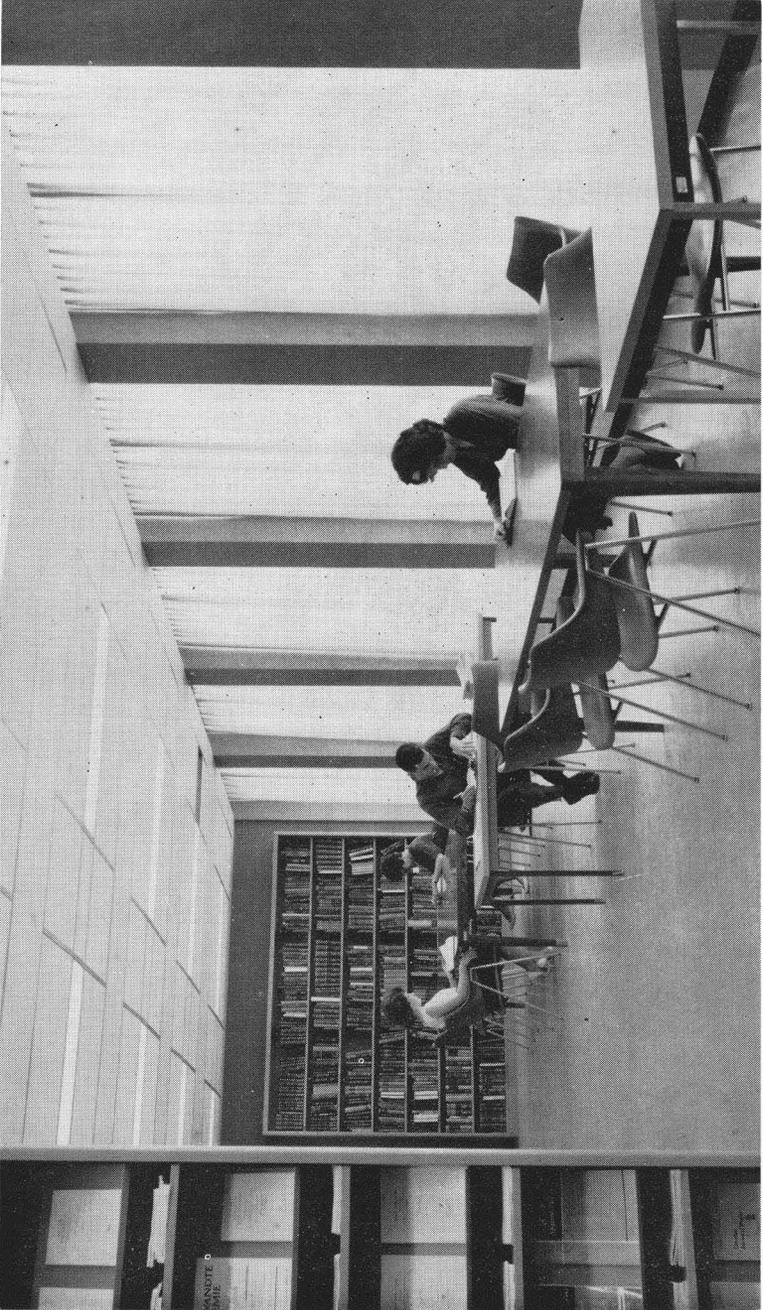
Students at work in the Library

A view of the Biology and Engineering Buildings
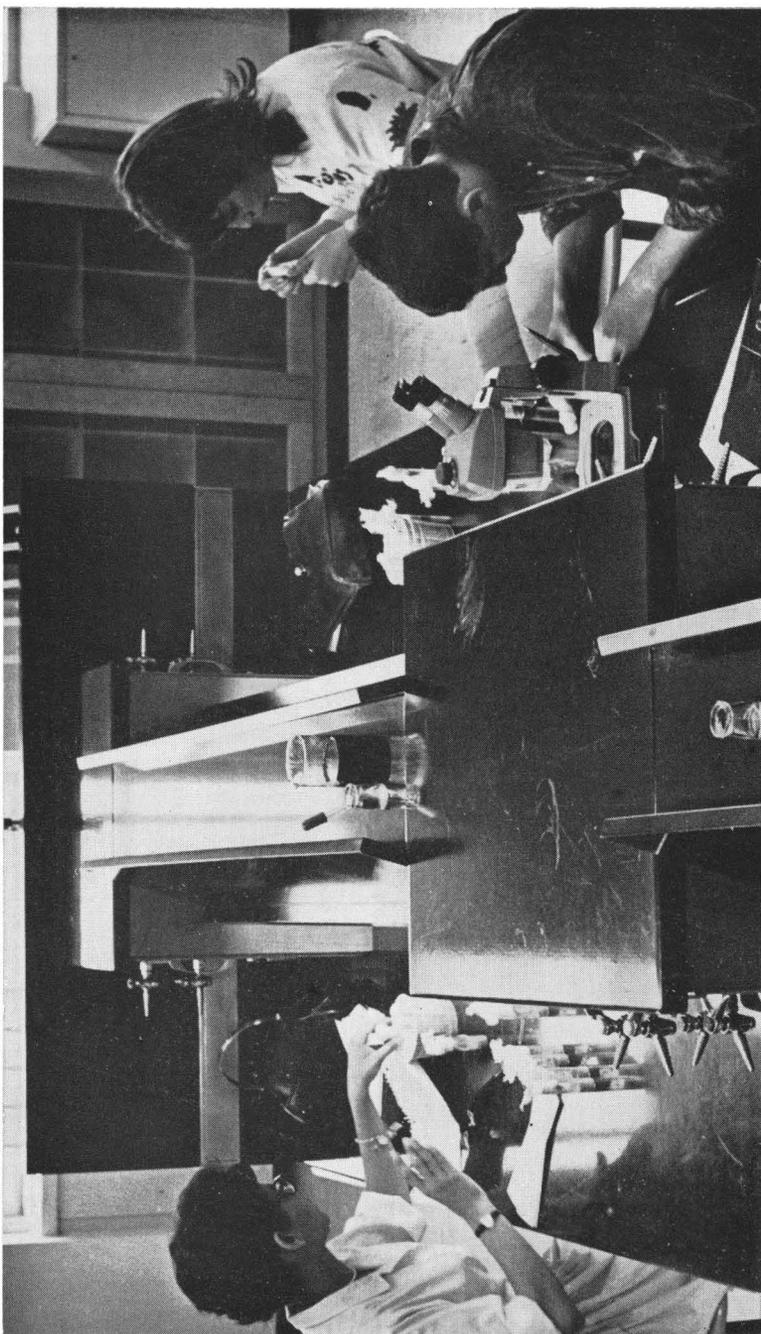
A biology experiment
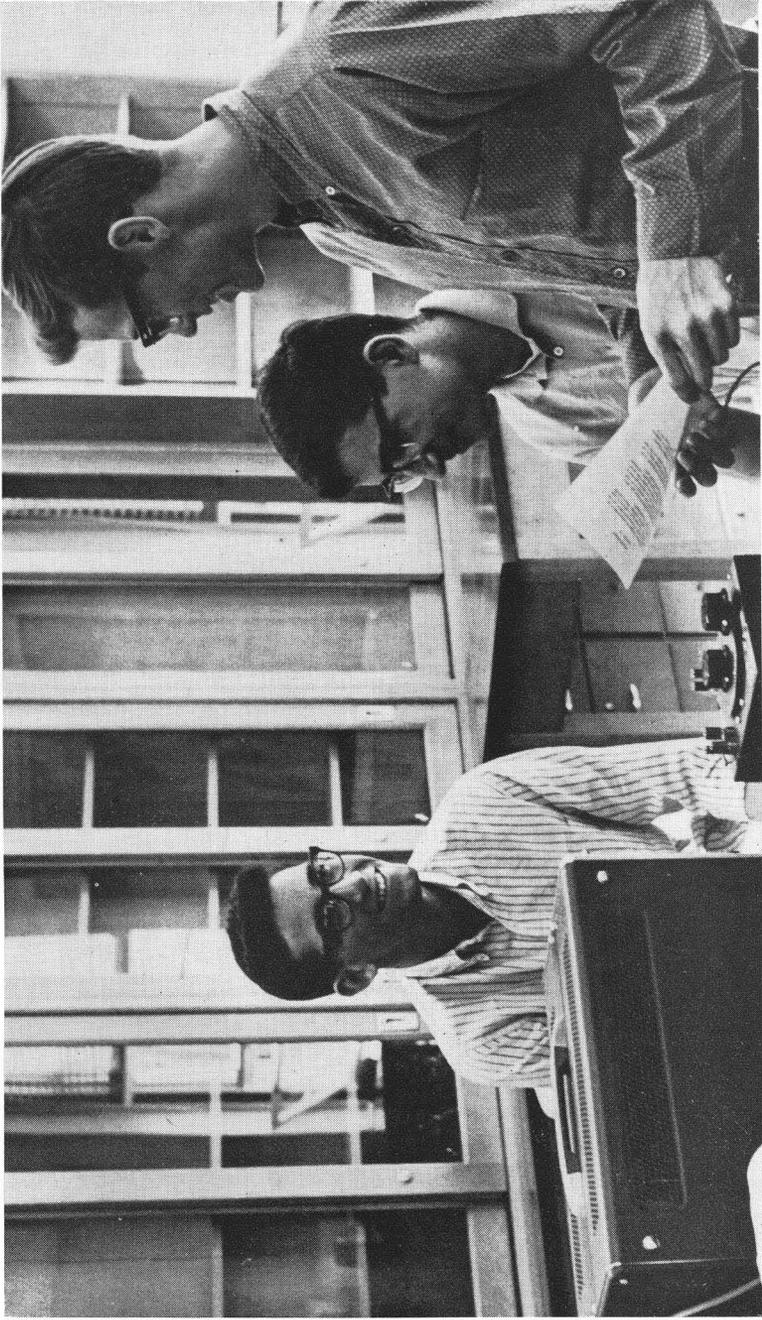
Discussing a physics problem
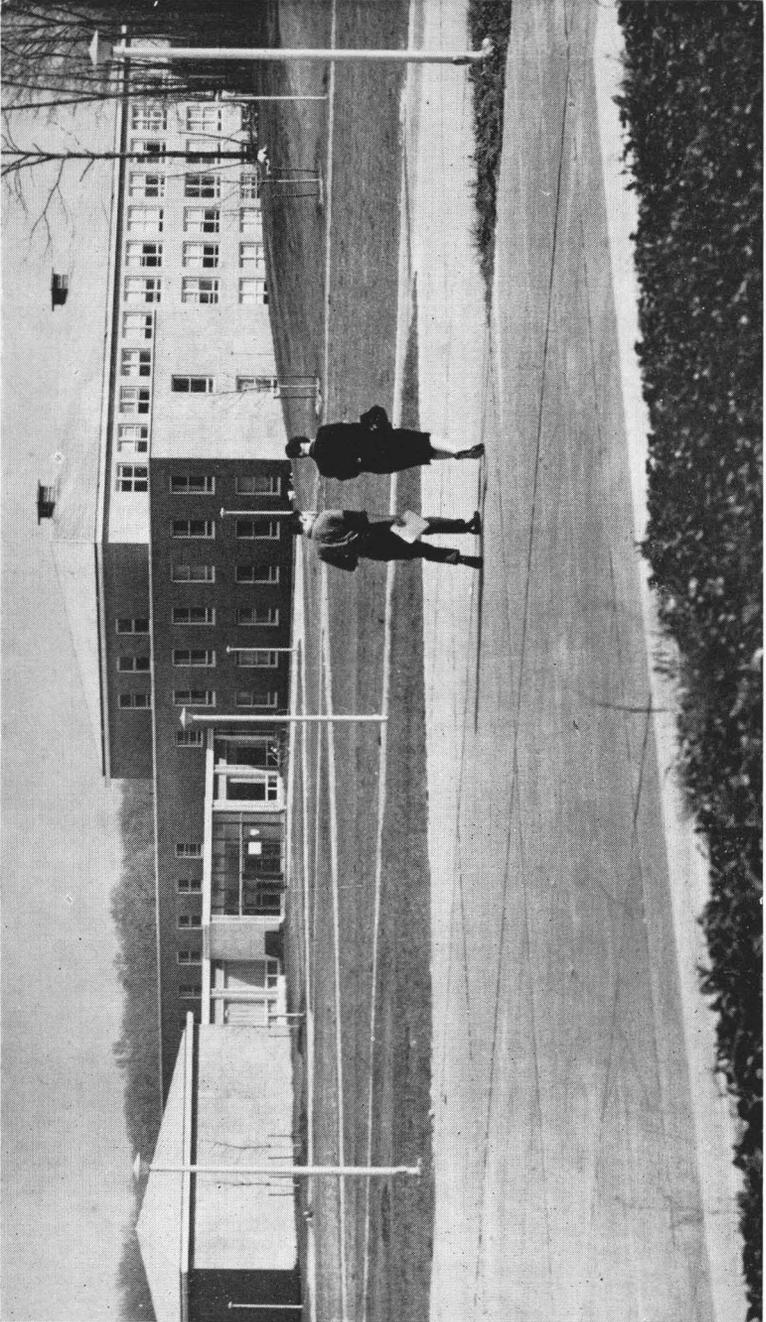
Approaching the Humanities Building
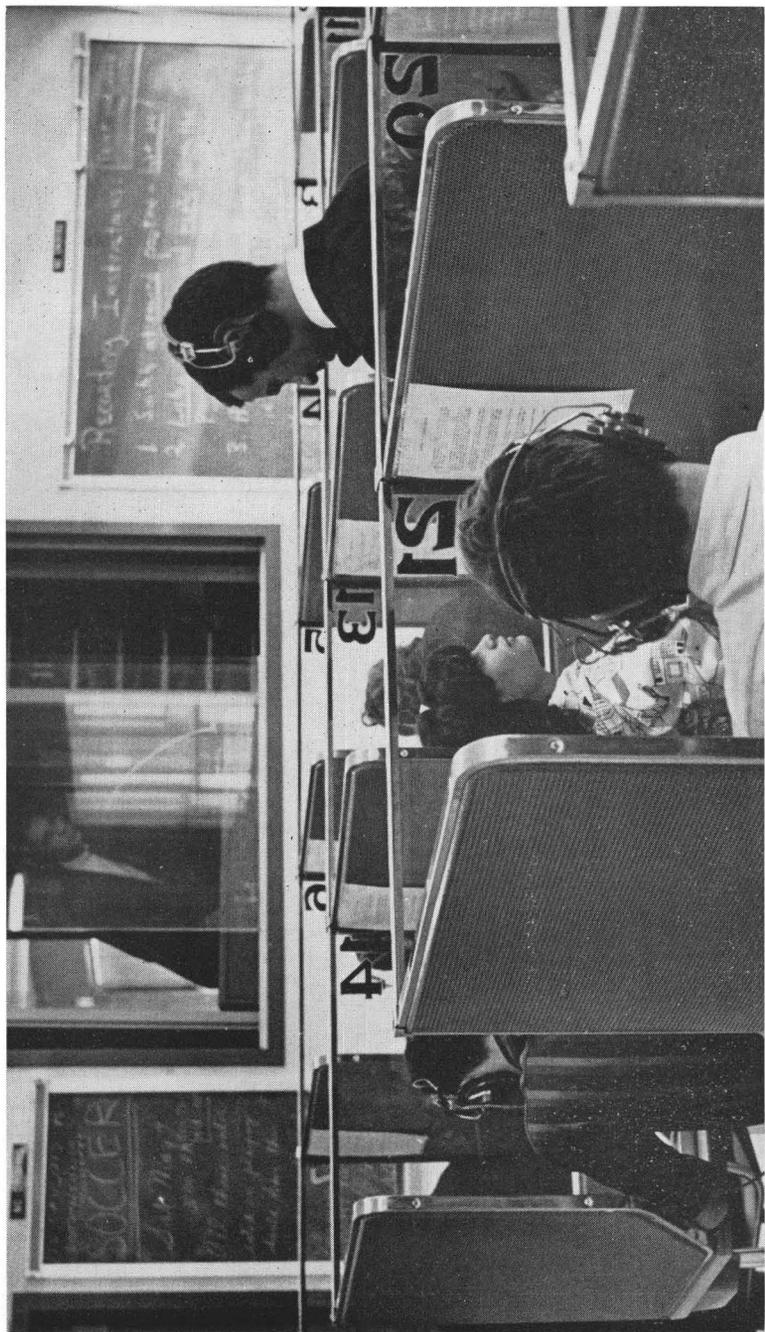
One of the Language Laboratories
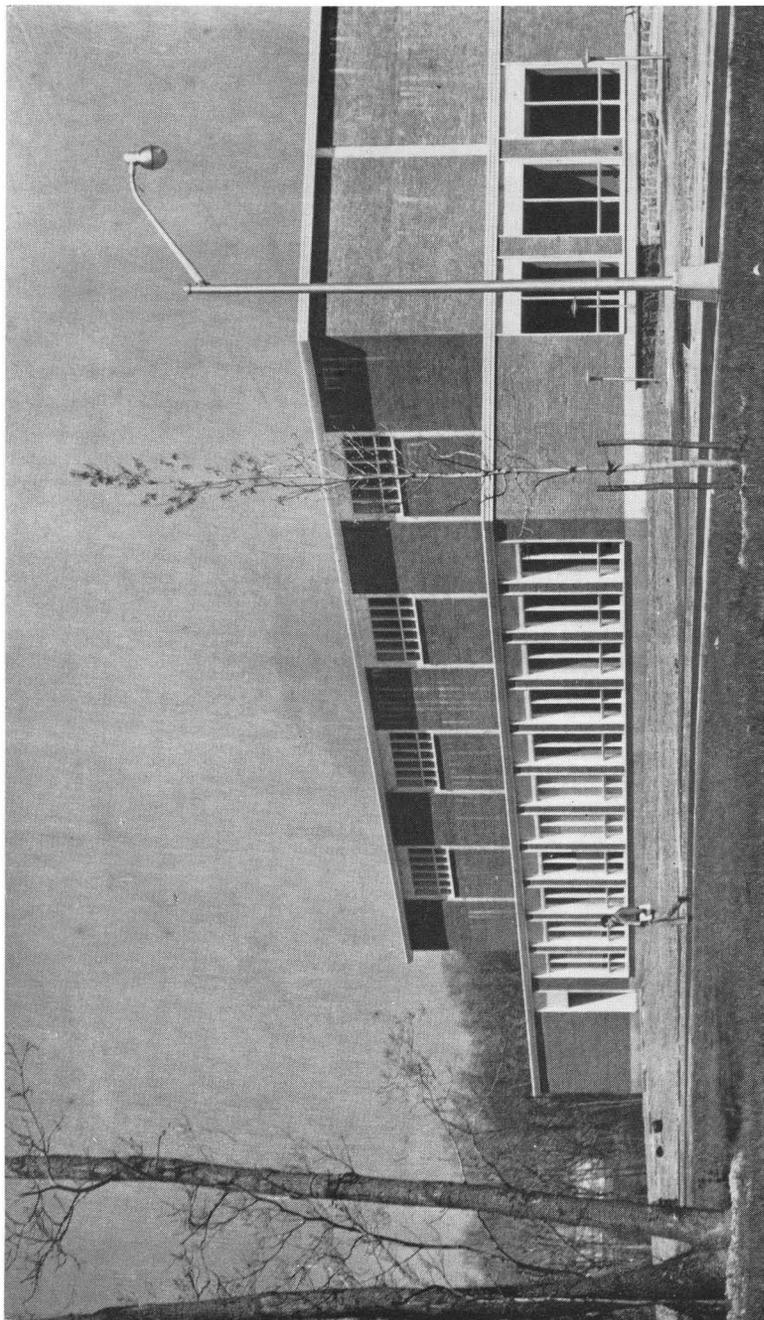
A corner of the Health and Physical Education Building

STATE UNIVERSITY OF
NEW YORK
AT STONY BROOK

College of Arts and Sciences

College of Engineering

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Council

Academic Calendar
1964-1965

Fall Semester 1964

Freshmen Orientation	September 17-18
Registration	September 21-22
Classes Begin	September 23
Thanksgiving Holiday	November 26-29
Classes Resume	November 30
Christmas Holiday	December 20-January 3
Classes Resume	January 4
Last Day of Classes	January 16
Semester Examinations	January 18-28

Spring Semester 1965

Registration	February 8-9
Classes Begin	February 10
Washington's Birthday (Holiday)	February 22
Spring Recess	April 11-18
Classes Resume	April 19
Last Day of Classes	May 22
Semester Examinations	May 24-June 3
*Memorial Day (Holiday)	May 31
Commencement	June 6

* Not a holiday for students taking examinations.

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A.B., University of Illinois; M.A., Ph.D., University of Chicago

Sei Sujishi, *Professor of Chemistry and Acting Chairman, Department of Chemistry*
B.S., M.S., Wayne State University; Ph.D., Purdue University

Clifford E. Swartz, *Associate Professor of Physics*
A.B., M.S., Ph.D., University of Rochester

*Stanley Tennenbaum, *Associate Professor of Mathematics*
Ph.B., University of Chicago

Reginald P. Tewarson, *Assistant Professor of Engineering*
B.S., Lucknow University, India; M.S., Agra University, India; Ph.D., Boston University

Devikumara V. Thampuran, *Associate Professor of Engineering*
B.Sc., M.Sc., University of Kerala, India; Ph.D., University of Wisconsin

Martin B. Travis, *Professor of Political Science and Chairman, Department of Political Science*
A.B., Amherst; M.A., Fletcher School of Law and Diplomacy; Ph.D., University of Chicago

Bernard D. Tunik, *Associate Professor of Biology and Deputy Chairman, Department of Biological Sciences*
B.A., University of Wisconsin; M.A., Ph.D., Columbia University

Edward Van Roy, *Instructor in Economics*
B.B.A., M.A., Clark University

A. Henry Von Mechow, *Assistant Professor of Physical Education and Acting Director of Physical Education*
B.S., Cortland State Teachers College; M.S., College of Education at Cortland

David Wallace, *Research Associate in Biology*
B.S., Washington College; M.S., University of Maryland

William F. Walsh, *Instructor in English*
B.A., St. John's University; M.A., Catholic University

Walter Watson, *Associate Professor of Philosophy*
Ph.B., Ph.D., University of Chicago

Stanley J. Weiss, *Assistant Professor of Psychology*
B.A., City College of New York; M.A., Ph.D., Ohio State University

Benkt Wennberg, *Assistant Professor of French*
Filosofie Kandidat, Upsala University; M.A., Bryn Mawr; Ph.D., University of Pennsylvania

Robert W. White, *Instructor in Art*
Diploma, Rhode Island School of Design; Fellow, American Academy in Rome

Allan K. Wildman, *Assistant Professor of History*
B.A., University of Michigan; B.D., Ph.D., University of Chicago

George C. Williams, *Associate Professor of Biology*
A.B., University of California at Berkeley; M.A., Ph.D., University of California at Los Angeles

***Jay C. Williams, Jr., *Professor of Political Science*
A.B., A.M., Ph.D., University of Chicago

Alice S. Wilson, *Assistant Professor of English*
B.A., Ladycliff College; M.A., Ph.D., Cornell University

Doris E. Yocum, *Instructor in Philosophy*
B.A., University of Pennsylvania

Eugene Zaustinsky, *Associate Professor of Mathematics*
A.B., University of California at Los Angeles; M.A., Ph.D., University of Southern California

Armen H. Zemanian, *Professor of Engineering*
B.E.E., City College of New York; M.E.E., Sc.D., New York University

Harold Zyskind, *Professor of Philosophy*
M.A., University of Chicago

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* *On leave for the Academic Year 1964/65*
** *On leave for the Fall Semester 1964*
*** *On leave for the Spring Semester 1965*

Foreword

The State University of New York at Stony Brook has undergraduate programs covering the full range of the liberal arts, science and engineering, and provides opportunity for the intellectual development of students who have the preparation and character to become responsible and contributing members of society. It offers the Bachelor of Arts, Bachelor of Science and Bachelor of Engineering degrees, the M.A., M.S., and Ph.D. degrees in physics, chemistry, biology, mathematics, and engineering analysis, material sciences, and thermal sciences, and is authorized to develop graduate programs in all of the principal fields of knowledge as soon as staff and facilities warrant.

Stony Brook, a publicly supported institution, provides the young people of New York with exceptional educational opportunities at low cost. As a University Center it combines the traditional function of the production of knowledge through research and other creative activity with the conservation of knowledge and its dissemination through teaching.

Today our national need is broadly educated leadership—the talents of America's sons and daughters at 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 national and international institutions. Only those who fully 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 America's greatest national resource, human intelligence, orient it culturally, and dedicate it spiritually, that it may make its fullest contribution and realize its highest significance in the solution of human problems.

Stony Brook can discharge its obligations to the people of New York State only if its students respond to the challenge and stimulus of learning. It therefore welcomes those who are grateful for the privilege of earning a college education, those who have faith in themselves and in their talents, and who have a desire to use fully and wisely the opportunities presented for self-development so that they may discharge with honor the responsibilities which must fall on their shoulders.

Karl D. Hartzell

History of the State University at Stony Brook

The State University of New York at Stony Brook, in the first seven years of its institutional life, experienced phenomenal growth, the pace of which will not be simply continued but greatly accelerated in the years immediately ahead. This process of development, the planned as well as the accomplished, must be stressed as the salient fact in any account of the University.

In September, 1957, the State University College on Long Island was founded at Oyster Bay, in temporary quarters on a handsome arboretum-estate donated by the late William R. Coe and called, significantly enough, Planting Fields, with fourteen members of the teaching faculty presenting six courses to approximately 145 freshmen, and with a mandate restricted to the training of teachers of mathematics and the natural sciences for secondary schools and community colleges. Such were the modest beginnings, but evolution was rapid. Each of the first four years witnessed an increase in the number of students and faculty, an expansion of course offerings, and a steady advance in the curriculum to full undergraduate programs. A series of additions to the original mandate included inauguration of a program for non-teaching majors in mathematics and the sciences, and a program for engineering students, and finally the authorization to award further degrees, including the Bachelor of Arts, the Bachelor of Science and Bachelor of Engineering Science, the Master's Degree, and the Ph.D. This expansion of actual and potential functions, all mandated before the beginning of the fifth year, resulted in the organization of the College of Arts and Sciences with its fourteen departments, and the College of Engineering with four departments, and in the prompt initiation of planning for graduate work. The widening responsibilities of the institution required another and more adequate designation, and the school became known as the State University's Long Island Center.

The full measure of growth will become apparent if one compares the University's situation in September, 1962, with that of its founding five years earlier. In the fall of 1962 it had moved most of its operations to its permanent campus, on a 480-acre tract of land,

the gift of Mr. Ward Melville. This new site 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. Construction work had begun in 1960, and at the opening of the academic year 1962-1963 the Humanities and Chemistry buildings had been completed, as well as a residence hall to accommodate 616 students, a dining hall capable of serving 1,000, and a group of service buildings. The University had 750 students, a faculty of 122 members, under-graduate degree programs in eighteen disciplines in the two Colleges, and graduate students in three fields. It then received its present name—the State University of New York at Stony Brook. The swift succession of names sums up three significant stages of development, the original college, the expansion of the mandate in 1961, and the move to Stony Brook in 1962.

But this story of speedy advancement has significance less as a record of accomplishment than as a revelation of rapidity of growth inherent in the life of the University. More noteworthy than its humble origins and brief past are its great expectations and the extent of its responsibilities to the people of the State. Only a partial notion of these can be conveyed by the citing of plans and projected statistics, impressive as these may be. New buildings which were first occupied in September 1963, are the Library, the Physical Laboratory (housing the Departments of Physics and Mathematics), and the Engineering and Biology buildings. The Health and Physical Education building was ready for use in May 1964. A new Master Site Plan covering the growth of the institution in two stages—through 1970 and through 1980—is presently under consideration. By 1966, approximately $60,000,000 will have been invested in construction, equipment, and landscaping, and an undergraduate student body of at least 3,000 is expected; residence halls to house over 6,500 students will be built by 1969, and an enrollment of 10,000 or more is envisioned for 1975. A student entering as a freshman in 1964, then, will find himself in a burgeoning community and one that will present him with an ever widening set of educational opportunities.

The University's confidence in an illustrious future does not rest simply on costly facilities and an exploding 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 scholarly and professional attainment. Such an effort is not a localized one; it finds impressive support in the Master Plan of the State University

and the Report of the Heald Commission. The Master Plan, recognizing that in the twenty years ahead society will need trained intelligence of the highest quality, and recommending the establishment of a "comprehensive graduate center" at Stony Brook that "should offer graduate programs, through the doctorate degree, in a wide variety of subject areas," calls for a highly qualified graduate faculty. The Heald Report recommends a public university at Stony Brook that "should be designed to stand with the finest in the country, and to attract and hold able men and women from all over the world." Such statements as these indicate why the State University at Stony Brook sets up lofty objectives, and takes pride in the leading role it has been assigned in New York's current pressing attempt to acquire institutions of higher learning worthy of her preeminence.

Moreover, with the relatively low tuition fees that tax support makes possible to a public institution, with the richness and variety of present programs to be increased as graduate work is introduced in each of the departments, with a faculty the present distinction of which is only partially revealed in a listing of degrees earned and the institutions that have awarded them, and with an advantageous location—near the important scientific research facilities of the Brookhaven National Laboratory, and within easy accessibility to the cultural resources of New York City—the State University at Stony Brook can look ahead, without complacency but with optimism, to a distinguished future.

Library

The Frank Melville Jr. Memorial Library, a three story air conditioned structure, occupies the highest point on the campus. The attractive contemporary building is designed for 350,000 volumes and will seat 1,250 students.

The library operates on the "open stack" plan which gives all students free access to all books except rare and costly volumes which are shelved in the rare Book Room. Sound proof typing and conference rooms are provided on the second and third levels. There is an equipped microform reading room, partially darkened, for the use of microprint, microfilm and microfiche materials; library holdings in this form are quite extensive.

The university library is a selective government depository and receives free of charge large numbers of U.S. government publications. Other document collections being developed include the United Nations, NASA, and New York State. The library also currently receives about 2,000 journals covering all areas of knowledge. The total book collection is now approaching 100,000 volumes.

The library furnishes students with recordings of music as well as records of speeches, poetry, and drama. The music library is located on the first floor of the building. The latest hi-fi equipment will soon be installed, and patrons will make use of headphones and a dialing system to hear recordings of their choice. Taped music, literary readings, plays, speeches and even tapes of bird calls and insect sounds will be utilized. This equipment was developed especially for the Stony Brook music library and will be operated by a music librarian and a skilled electronics engineer.

The plan of the building is based on the module concept so that its function will be flexible and changes can be made in the interior plan when desired. It is intended that this building be the first part of a larger structure which will ultimately have space enough to contain one million volumes and serve a student body of fifteen thousand. Until the completion of the administration building, now in the planning stage, the Melville Memorial Library will house the administrative and business offices on one half of the second floor.

Admission

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 and who are prepared to continue their studies on a full-time basis.

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

A pamphlet, *How to Apply for Admission,* giving complete application instructions, 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.*

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.

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.

Additional Information

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

Academic Programs

The State University of New York at Stony Brook has been authorized to award the degrees of Bachelor of Arts, Bachelor of Science, Bachelor of Engineering, Master of Arts, Master of Science, and Doctor of Philosophy.

In the College of Arts and Sciences, the degree of *Bachelor of Arts* is offered with a major in Anthropology, Economics, English, Fine Arts (Art, Drama and Theater, or Music), Foreign Languages and Literatures, History, Philosophy, Physics, Political Science, Psychology, and Sociology; the degree of *Bachelor of Science* is offered with a major in the Biological Sciences, Chemistry, Mathematics, or Physical Sciences. The College of Engineering offers a program leading to the degree of *Bachelor of Engineering.*

The University requires each candidate for an undergraduate degree to earn a minimum of 120 credits in the College of Arts and Sciences and 128 in the College of Engineering in courses approved for his program by a faculty advisor.

Students in Bachelor of Arts or Bachelor of Science degree programs may also earn temporary certification for teaching in the academic fields in elementary and secondary schools. (See "Department of Education" for further information.)

Graduate programs are offered in the fields of biology, chemistry, engineering (engineering analysis, material sciences, thermal sciences), mathematics, and physics. Departments throughout the University will, at varying dates, introduce graduate work leading to advanced degrees. For further information see the *Graduate School Bulletin.* (Inquiry should be addressed to the Graduate School Office of the State University of New York at Stony Brook.)

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 may 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, physics), with one of the years in a course that includes a laboratroy; 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 courses are 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, 111, 112, 113, 114, 115, 121, 122, 123. No more than 6 hours of work may be taken in any one of the following areas: Fine Arts, (Humanities 111, 112, 113, 114, 115), 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 selecting one semester of Political Science must take Political Science 101.)

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; 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; FLR, Russian; FLS, Spanish, etc.); HIS, History; HUM, Humanities; MAT, Mathematics; POL, Political Science; PHI, Philosophy; PHS, Physical Science; PHY, Physics; PSY, Psychology; SOC, Sociology; SSC, Social Science.

Department of Anthropology

Professor: Louis C. Faron (Chairman)

(An undergraduate program in Anthropology will be announced.)

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.

Mr. Faron   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

Department of Biological Sciences

Professors: *Frank C. Erk (Chairman), *Sol Kramer
Associate Professors: Bernard D. Tunik (Deputy Chairman), Edwin
    H. Battley, Vincent P. Cirillo, Raymond F. Jones, Robert W.
    Merriam, Robert E. Smolker, George C. Williams
Assistant Professors: Albert D. Carlson, James A. Fowler, John J.
    Gaudet, Edward E. Gilbert, George J. Hechtel, 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 (Central Chemistry)
    Physics 161, 162 (Introductory Physics)
    Mathematics 102, 103 (Calculus I, II)
    Foreign Language (Proficiency in French, German, or
        Russian)

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* *On leave for the Academic Year 1964/65*

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 class discussions on 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.

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.

Prerequisite: Biology 102 with grade of C.

Messrs. Merriam, Rosenberg 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.

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

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.

Mr. Smolker   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.

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

Mr. Rosenberg   Spring, 3 credits

Biology 241. Microbiology

An introduction to the study of microorganisms through a series of problems which include considerations of taxonomy, development, structure, physiology, reproduction, and ecology.
Prerequisite: Biology 102 with grade of C.

Fall, 4 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.
Prerequisite: Biology 102 with grade of C.

Mr. Gaudet   Spring, 4 credits

[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.
Prerequisite: Biology 102 with grade of C.

Fall, 4 credits

To be offered 1965-66.

[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.
Prerequisite: Biology 102 with grade of C.

Spring, 4 credits

To be offered 1965-66.

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 three hours of laboratory per week.
Prerequisites: One year of physics, one year of chemistry, and mathematics through calculus.

Mr. Carlson   Fall and Spring, 4 credits each semester

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.

Mr. Gilbert   Fall and Spring, 1 credit each semester

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.

Prerequisites: Mathematics 103 and 16 credits of biology and/or psychology courses.

Mr. Smolker   Fall, 3 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. Laboratories and field work on Saturdays.

Prerequisites: Biology 247, 301, or permission of instructor.

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.

Prerequisites: Biology 201, 202.

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.

Prerequisites: Biology 201, 202, 341.

Spring, 4 credits

Biology 391-392. 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

Graduate Courses

(For details see the *Graduate Bulletin*)

Biochemistry
Theory and Use of Radioisotopes in Biology
Cellular Biology
Physiological Genetics
Genetics of Microorganisms
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 (Acting Chairman)
Associate Professors: John M. Alexander, Edward M. Kosower, Paul
   C. Lauterbur
Assistant Professors: Ivan Bernal, Robert S. Boikess, Theodore D.
   Goldfarb, William C. Kern, William J. le Noble, Arthur R.
   Lepley, Robert 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 ap-
proved 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 93). 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 Prepara-
tion.

The Chemistry program comprises required course work of one
year each in general chemistry, quantitative chemistry, organic chemis-
try, 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 addi-
tion, 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.

A. Study within the area of the major
*Chemistry 101, 102, or 103, 104 (General Chemistry or
Introduction to Modern Chemistry)*

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* *On leave for the Academic Year 1964/65*

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, 155 (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. le Noble   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. le Noble   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.

Messrs. Goldfarb, 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.

Messrs. Ramirez, 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 students having high academic standing in chemistry may petition the Department for permission to register in certain first-year graduate courses. See Graduate School Bulletin.

Graduate Courses

(For details see the *Graduate Bulletin*)

Advanced Organic Chemistry
Physical Organic Chemistry
Advanced Inorganic Chemistry
Physical Inorganic Chemistry
Quantum Chemistry I
Quantum Chemistry II
Chemical Thermodynamics
Chemical Kinetics
Introduction to Statistical Mechanics
Nuclear Chemistry
Seminar
Seminar
Research
Special Topics in Organic Chemistry
Intermediates in Organic Chemistry
Theoretical Organic Chemistry
Molecular Biochemistry
Special Topics in Inorganic Chemistry
Special Topics in Physical Chemistry
Molecular Spectroscopy
Magnetic Resonance
Research

Department of Economics

Associate Professors: Charles Hoffmann (Acting Chairman), Marvin Kristein
Assistant Professors: Eliyahu Kanovsky, Woo Sik Kee
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

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. Hoffmann   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.

Mr. Kanovsky   Spring, 3 credits

Economics 203. Public Finance

An examination of government finance covering taxation, debt and expenditures. Major emphasis is placed on the nature and effects of fiscal policies and their coordination with other public policy. Prerequisites: 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.

Mr. Kanovsky   Spring, 3 credits

Economics 210. Introduction to International Economics

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

Mr. Kanovsky   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. Two hours of laboratory work, additional.

Mr. Kanovsky   Fall, 4 credits

Economics 222. Economic Statistics

A continuation of Economics 221, which is a prerequisite.

Mr. Kanovsky   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. Kristein   Spring, 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 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. Van Roy   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. Kristein   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 economics systems, comparing structures, the ways basic economic problems of factor allocation and distribution are dealt with, and the results 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 Preparation), Frank R. Peters
Assistant Professor: Sidney I. Love
Instructor: Eli Seifman

The Department offers those courses in education required for the provisional certification of secondary school teachers and advises prospective teachers with regard to the fulfillment of certification requirements. Programs leading to provisional certification are offered in the following fields: biology, chemistry, English, foreign languages, mathematics, physics, and social studies.

A program in elementary education is being offered for the first time at Stony Brook in the Fall of 1964. Students wishing to teach in the elementary schools should enroll in a B.A. or B.S. degree program.

There is no undergraduate major in 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 Human Growth and Behavior, 3 hours; 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.

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

Biology 239. Materials and Methods in Teaching Biology
English 239. Methods of Instruction in Literature and Composition
Foreign Languages and Literature 239. Methods and Materials in the Teaching of Foreign Languages
Mathematics 239. The Number System

On leave for the Fall Semester 1964

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

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: Spindler, Jules Henry, Friedenberg, Sullivan, Alexander Cohen, and others.
Prerequisite: None.

3 credit hours

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. Watson, Sternfeld   Fall and Spring, 3 credits each semester

Education 350. Practice Teaching

Prospective secondary school teachers receive supervised practice in teaching their subjects to high school classes, by arrangement with selected Long Island high schools. Frequent consultations with the supervising teacher and twice-weekly seminar meetings with a University faculty member help the student to interpret and evaluate his apprenticeship experience.
Prerequisite: Senior standing and approval of Director of Teacher Preparation.
Messrs. Gardner, Love, Peters, Seifman   Fall and Spring, 6 credits

Department of English

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

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

Assistant Professors: Ruth Blackburn, Sallie S. Goldstein, Joseph Pequigney, Alice S. Wilson

Instructors: Robert A. Ackerman, *Elizabeth Coleman, Richard F. Dunlavey, Carolyn Faulk, Sidney Feshbach, Howard J. Harvey, Bernice W. Kliman, Norman R. Leer, 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

    English 281, 282 *(Literary Criticism)*

    English 211 *(Shakespeare)*

    A minimum of six approved electives in English and American literature, chosen with the approval of the departmental adviser to secure a proper distribution among the major historical periods and literary genres. At least four of these courses must be at the 200 or 300 level.

B. Study in related areas

    Two years of course work in approved foreign languages, which must include at least six hours of third-year college level study of literature in a foreign language.

    Two semesters of course work in English or American history.

    Two semesters of course work in Philosophy and/or comparative literature**

C. Departmental examination

    Each student must pass a departmental examination on a prescribed list of books covering the range of English and American literature. This examination is normally taken at the beginning of the senior year.

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* *On leave for the Academic Year 1964/65*

** "Comparative literature" includes such courses as *English* 394 (Satire).

Courses in English

English 101, 102 are prerequisites to all other courses in the department.

English 101, 102. Composition

English 101, 102 is a first-year course in writing and reading, required of all students. It gives the student considerable practice in writing exposition and argument, and makes use of selections in prose and imaginative literature for analysis of form and style and improvement in reading proficiency.

Staff   Fall and Spring, 3 credits each semester

English 151. Interpretation of Poetry

Poems in English of various periods and types and varying complexity will be analyzed.

Staff   Fall and Spring, 3 credits each semester

English 161. Techniques of Fiction

Short stories and novels will be used in the analysis of stylistic and structural modes employed by writers of prose fiction.

Staff   Fall and Spring, 3 credits each semester

English 206. Middle English Literature

Major works of prose, poetry and drama of the Middle English period (1300-1500), excluding Chaucer. These works will be studied in the original language.

Prerequisite: English 207 or consent of instructor.

Mr. Jordan   Spring, 3 credits

English 207. Chaucer

The course consists mainly in a study of *The Canterbury Tales* and *Troilus and Criseyde* in Middle English. The minor poems and other works receive some attention.

Mr. Jordan   Fall, 3 credits

English 211. Shakespeare

Shakespeare's achievement is examined by the analysis of about fifteen of his plays selected to represent the major types of drama that he wrote.

Messrs. Levin, Stampfer, and Staff   Fall and Spring, 3 credits

English 213. Tudor and Stuart Drama

The course covers the period from the beginnings of English secular drama to the closing of the theaters in 1642, studying representative

plays from the major dramatists (except Shakespeare) and the major genres.
Prerequisite: English 211, or consent of instructor.
Mr. Levin   Spring, 3 credits

[English 215. Sixteenth Century Poetry]
Readings in Skelton, Wyatt, Surrey, Ralegh, Spenser, Sydney, Daniel, Davies and Marlowe.
Prerequisites: English 151 and junior standing.
Mr. Stampfer   3 credits
To be offered 1965-66

[English 216. Renaissance Prose]
Major prose writers of the sixteenth and earlier seventeenth centuries will be read, and their styles examined as well as the intellectual contents and contexts of their work.
Mr. Pequigney   3 credits
To be offered 1965-66.

English 225. Poetry of the Early Seventeenth Century
The poetry of Donne, Jonson, Herbert, Herrick, Crashaw, Vaughn, and Marvell will be discussed, and some attention given to the minor poets of the period.
Mr. Pequigney   Spring, 3 credits

English 227. Milton
All of Milton's English poetry and selections from his prose works will be studied, with *Paradise Lost* to receive the major emphasis.
Mr. Pequigney   Fall, 3 credits

English 233. English Drama, 1660-1780
Analysis of representative works of the major dramatists from Dryden to Sheridan, with emphasis on the changing patterns of comedy and such distinctive forms as the heroic play, bourgeois tragedy, and sentimental comedy.
Mr. Goldberg   Fall, 3 credits

[English 235. Restoration and Eighteenth Century Verse]
Selected lyric, satirical, and intellectual poems from 1650 to 1800.
Mr. Goldberg   3 credits
To be offered 1965-66

English 236. Restoration and Eighteenth Century Prose
Major works of English satirical, intellectual, and occasional prose, exclusive of the novel, in the late seventeenth and eighteenth centuries.
Mr. Marsh or Mr. Goldberg   Spring, 3 credits

English 237. Eighteenth Century English Novel
The English novel of the eighteenth century will be studied with emphasis upon comparative analysis of the form and style of novels of the major figures.

Mr. Goldberg   Fall, 3 credits

English 245. Poetry of the Nineteenth Century
Works of the major English poets from Wordsworth and Coleridge to Thomas Hardy.

Mr. Kazin or Mr. Stampfer   Fall, 3 credits

English 256. Victorian Prose
Readings in Carlyle, Newman, Arnold, Huxley, Mill, Ruskin.
Prerequisite: Junior standing.

Mr. Rogers   Spring, 3 credits

English 265. Modern British and American Poetry
Twentieth-century British and American poetry, with concentration on such figures as William Butler Yeats, T. S. Eliot, W. H. Auden, Wallace Stevens, Dylan Thomas, and Robert Frost.

Mr. Ludwig or Mr. Stampfer   Spring, 3 credits

English 267. Contemporary British and American Novel
A study of the novels of such figures as Joyce, Lawrence, Fitzgerald, Faulkner, Hemingway, Forster.

Fall, 3 credits

[English 271. Representative Figures in American Literature I]
The work of major American writers from the Colonial to the Civil War periods.

Mr. Fiess   Fall, 3 credits

To be offered 1965-66.

[English 272. Representative Figures in American Literature II]
This course, which is a continuation of English 271 but may be taken separately, will examine the work of major American writers from the Civil War period to the present.

Spring, 3 credits

To be offered 1965-66.

English 281, 282. Literary Criticism

Logical analysis and practical illustration of the problems, methods, and doctrines of selected major literary critics from ancient to modern times. Prerequisite: Junior standing.

Staff   Fall and Spring, 3 credits each semester

English 283. The English Language

The course seeks to improve the student's understanding and control of the English language, especially in its spoken form, through practice and through trained observation. The semantic, phonetic, and syntactical aspects of English are studied from the point of view of past history and present usage.

Spring, 3 credits

English 285. Methods of Instruction in Literature and Composition

The intellectual grounds on which the teaching of literature and composition in secondary school rests will be examined, and the problems involved in communicating genuine literary values to high school students will be explored.
Prerequisite: Junior standing.

Mr. Rogers   Fall, 3 credits

[English 295. The Bible as Literature]

The course stresses the literary forms and themes in selected readings from the Old and New Testaments.

Mr. Stampfer   Spring, 3 credits
To be offered 1965-66.

[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.
Prerequisites: English 237 or 267, or consent of instructor.

Mr. Ludwig   3 credits
To be offered 1965-66.

English 366. William B. Yeats

Readings in the poetry, plays, autobiographies, and letters of Yeats.
Prerequisites: Two 300 courses in English Department or permission of instructor.

Mr. Ludwig   Fall, 3 credits

English 371. Seminar in Major American Authors

The members of the seminar will make an intensive study of major American writers of the earlier nineteenth century.

Mr. Kazin   Fall, 3 credits

English 372. Seminar in Major American Authors

The members of the seminar will make an intensive study of major American writers of the later nineteenth and twentieth centuries.

Mr. Kazin   Spring, 3 credits

[English 375. Major American Poets]

Studies in American Poetry from Emerson to Robert Frost.

Prerequisites: English 151 and junior standing.

Mr. Kazin   3 credits

To be offered 1965-66.

[English 394. Satire and the Satiric Spirit]

A critical analysis of satire and the satiric spirit from Aristophanes through the Roman Formal Satirists—Horace, Juvenal, Persius—to writers such as Chaucer, Rabelais, Ben Jonson, Molière, Dryden, Swift, Voltaire, Pope, Byron, Stendhal, Flaubert.

Prerequisites: Senior standing or consent of instructor.

Mr. Ludwig   3 credits

To be offered 1965-66.

English 399. Independent Project

This advanced tutorial will culminate in a major essay that permits the student to apply in a rigorous and original manner the disciplines and knowledge he possesses to a restricted topic in English literature.

Prerequisites: Senior standing and consent of the chairman of the department.

Staff   Spring, 3 credits

Department of Fine Arts

Professor: John Newfield (Drama), Chairman

Associate Professors: Allan Kaprow (Art), Isaac Nemiroff (Music)

Assistant Professors: Edward A. Bonvalot (Music History), Edward J. Countey, Jr. (Art), Jacques Guilmain (Art History), Charles Loyd Holt (Drama), Milton B. Howarth (Drama), John Lessard (Music), Mark D. Orton (Music)

Instructors: Robert W. White (Art), *Martin Canin, *Gerald Tarack

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	12 credits
2. Theory and History	24 credits

B. Courses in related areas

1. Electives in Music, Theater Arts, and Aesthetics	9 credits
2. Additional Foreign Language	6 credits

(Art majors are required to show proficiency in Italian and German.)

C. Comprehensive examination

At the conclusion of 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.

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* Part-time Instructors.

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.

Messrs. Countey, Kaprow   Fall, 3 credits

Art 122. Studio II (Modeling and Carving)

The study of three dimensional formal relationships through the techniques of modeling and building in clay and plaster, and of carving from plaster, stone and wood. 6 hours studio work.

Prerequisite: Art 121 or permission of instructor

Mr. White   Spring, 3 credits

Art 221. Studio III (Painting)

An extension of the principles in Art 121, with greater concentration on more complex technical and aesthetic problems. The application of these to pure color-theory and its relation to the various media: watercolor, oils, tempera. The special nature of painting as distinct from drawing. 6 hours studio work.

Prerequisite: Art 121 or permission of instructor.

Mr. Kaprow   Fall, 3 credits

Art 222. Studio IV (Sculpture)

An extension of the principles in Art 122 with greater concentration on more complex technical and aesthetic problems. 6 hours studio work.

Prerequisite: Art 122 or permission of instructor

Mr. White   Spring, 3 credits

Art 223. Studio V (Graphics)

Study and practice of traditional and modern print making methods: engraving and etching, mezzotint, aquatint, color printing, etc. 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: Permission of instructor.

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: Permission of instructor.
Mr. Guilmain   Spring, 3 credits

Art 336. Modern Art
European Art of the 19th and 20th centuries.
Prerequisite: 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: Permission of instructor.
Mr. Guilmain   Fall, 3 credits
To be offered 1965-66.

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	24 credits
2. Music History	9 credits
3. Applied Music	6 credits

B. Study in related areas

1. Electives in Art History, Theatre Arts,
   Aesthetics   9 credits
2. Additional Foreign Language   6 credits
   (Music majors are required to show proficiency in
   French and German.)

C. 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. Entrance Examination for Music Majors: Before enter-
ing *Music* 221 and 222 all prospective music majors will be
asked to take an examination in identifying the sounds they
hear, in reproducing the sounds represented by notes on
paper, and in harmonizing simple melodies at the keyboard.

3. Comprehensive Examination: At the conclusion of the
senior year all music majors must pass a departmental exam-
ination on certain aspects of music selected by the faculty
and appropriate to the student's field of interest.

4. Departmental Requirements. All music majors who do
not specialize in an orchestral instrument have to participate
in the University Chorus for two years. Instrumentalists, in-
stead of the second year of Chorus, are required to partici-
pate in one year of Instrumental ensemble.

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 perform-
ances obligatory.
Open to students, faculty, staff, and outsiders.
Prerequisite: Auditions.
Mr. Orton   Fall and Spring, no credit

Music 102. Instrumental Instruction

Half-hour individual lesson each week, with 5 hours practice required. End-of-semester examination on material assigned determines credit. Prerequisite: Permission of instructor.

Mr. Canin (Piano), Mr. Tarack (Violin)

Fall and Spring, 1 credit each semester

Music 103. Instrumental Ensemble

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

Mr. Nemiroff (Woodwinds), Mr. Tarack (Strings)

Fall and Spring, ½ credit each semester

Music 112. University Chorus

Open to all students. Study and peformance 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. Meetings three hours per week. Prerequisite: Auditions.

Mr. Orton   Fall, Spring, no credit or 1 credit per year

Music 121. Fundamentals of Music I

Sight reading, sight singing, notation, rhythmic and melodic dictation, intervals, the construction of scales. Prerequisite: 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 Classic 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. Prerequisites: Music 121 and 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

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: 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 parts, all five species.

Prerequisite: Permission of instructor.

Mr. Nemiroff   Fall, 3 credits

Music 236. Counterpoint II

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

Prerequisite: Music 235.

Mr. Nemiroff   Spring, 3 credits

Music 237. The Music of the Medieval, Renaissance, and Baroque Periods

A study of the outstanding literature of music and its composers from the early Middle Ages (Gregorian chant) through the Baroque period.

Prerequisites: Music 121 and 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 rapprochement of "Jazz" and "Serious Music."

Prerequisite: Permission of instructor.

Mr. Nemiroff   Spring, 3 credits

Music 240. The Music of the Classical and Romantic Periods

A historical survey of music from the mid-18th century through the first quarter of the 19th century with particular emphasis on the development of the major musical forms and detailed examination of 19th century music from the late Beethoven and Schubert through Mahler.

Prerequisite: Music 237 or permission of instructor.

Mr. Bonvalot   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   15 credits
2. History   15 credits
3. Techniques   9 credits

B. Courses in related areas
1. Electives in Music, Art, Aesthetics   9 credits
2. Electives in English and/or foreign dramatic literature including a 3 credit course in Shakespeare.   9 credits

C. Comprehensive Examination
At the conclusion of 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: Theater 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.
Mr. Holt   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: Theater 231.
Mr. Howarth   Spring, 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

Professor: Seymour L. Flaxman (Chairman and Director of Language Laboratories)
Associate Professors: Linette F. Brugmans, Herman Iventosch
Assistant Professors: Harriet R. Allentuch, Russell E. Brown, Nuci Kotta, Leonard R. Mills, Benkt Wennberg
Instructors: Demetrius Basdekis, Mildred C. Johnson, Carol K. O'Brien, Daniel C. O'Neil, George W. Rose, Barry J. Rubin, Ferdinand A. Ruplin, Robert D. Sloan, Jr.

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 Teaching 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.

Miss O'Brien   Fall and Spring, 3 credits each semester

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.

Mr. Wennberg, Mrs. Allentuch

[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.

Fall and Spring, 3 credits each semester

To be offered 1965-66

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, 3 credits

[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 1965-66

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 instructor.

Fall and Spring, 3 credits each semester

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 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 1965-66

German 341, 342. German Poetry since Hölderlin

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.

Mr. Brown   Fall, 3 credits

[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.

Mr. Flaxman   Fall and Spring, 3 credits each semester

To be offered 1965-66

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.

Mr. Flaxman   Fall and Spring, 3 credits each semester

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 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 1965-66.

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

To be offered 1965-66

[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

To be offered 1965-66

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.

Staff   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.

Staff   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 re-

quired. 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

To be offered 1965-66

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*.
Prerequisite: Spanish 331, 332, or equivalent.

Mr. Iventosch   Fall and Spring, 3 credits each semester

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 audio-lingual 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

To be offered 1965-66.

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.

Mr. Flaxman   Spring, 3 credits

Department of History

Professor: Stanley R. Ross (Chairman)
Associate Professors: Hugh G. Cleland (Deputy Chairman), Werner
    T. Angress, *Bernard Semmel, Philip J. Staudenraus
Assistant Professors: Robert H. G. Lee, John W. Pratt, Joel T. Rosen-
    thal, 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-year senior departmental seminar.

3) Advanced courses, chosen in consultation with the ad-
viser. 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 de-
partment, 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

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, Spring, 3 credits

* On leave for the Academic Year 1964/1965

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, 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, Staudenraus, Pratt   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, Staudenraus, Pratt   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. Ross   Fall, 3 credits

To be offered 1965-66.

[History 154. Latin America Since 1825]

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

Mr. Ross   Spring, 3 credits

To be offered 1965-66.

History 155. England from 1485 to 1760

This analysis of the socio-economic, political and intellectual history of England from the establishment of the Tudor monarchy until the accession of George III, will survey such subjects as the Reformation, the Age of Elizabeth I, the struggle between the Stuarts and the Parliament, the Civil Wars, the 'Glorious Revolution' and the Whig parliamentary ascendancy.

Mr. Bottigheimer   Fall, 3 credits

History 156. British History Since 1760

The transformation of English society by the Industrial Revolution, the coming of democracy, imperialism and the Pax Britannica, and the decline of British power in the twentieth century.

Mr. Bottigheimer   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 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   3 credits

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   3 credits

[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.

3 credits

To be offered 1965-66.

[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 1965-66.

[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 1965-66.

[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
To be offered 1965-66.

[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
To be offered 1965-66.

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
    To be offered 1965-66.

[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
    To be offered 1965-66.

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

[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
    To be offered 1965-66.

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 1965-66.

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

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 of the American Constitution in the twentieth century.

Mr. Pratt   Spring, 3 credits

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

History 274. Social & Intellectual History of the United States Since 1865

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

Mr. Staudenraus   3 credits

[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

To be offered 1965-66.

[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

To be offered 1965-66.

History 391, 392. Senior Seminar in History

Special topics, projects, and research papers are undertaken.

Messrs. Angress, Pratt   Fall and Spring, 3 credits each semester

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 as Molière, Racine, Voltaire, Diderot, Leibniz, Lessing, Montesquieu, Goethe, and Richardson.

Staff   3 credits

Humanities 111. A Study in the Traditions of Art

An introductory course for those students who have some prior knowledge of or interest in art. Through studio exercises of the simplest kind, as well as lectures, class discussions, and visits to museums, the student considers such basic themes as elements of form, expression, art and history, etc. The studio work is not designed for future artists and requires no special talent; it is, instead, a participation in some of the rudiments of the language of the visual arts.

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 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, Leslie G. Peck

Associate Professors: William D. Barcus (Acting Chairman), Ernest S. Elyash, William C. Fox, Saul Kravetz,* Stanley Tennenbaum, Eugene Zaustinsky

Assistant Professors: Harold Bell, Ross H. Cornell, Paul G. Kumpel, Jr.

Instructors: Morris E. Bram, John Frampton, Cyril L. Gape, Richard W. Glasheen, Chia-Hui Shih Kuo, Mark W. Mandelker

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.

Courses in Mathematics

Mathematics 101. Elementary Functions

Relations, graphs, functions. Algebraic operations on functions. Analysis of rational, trigonometric and exponential functions.

(see next page)   Fall, 3 credits

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* *On leave for the Academic Year 1964/1965*

N.B. Mathematics 102, 103 is the normal freshman sequence for students 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.

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 variable.
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.
Prerequisite: Mathematics 155.

Spring, 3 credits

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. Tensor and exterior algebras. 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

Groups, homomorphisms, normal subgroups, quotient groups. Rings, homomorphisms, ideals, quotient rings. Principal, prime and maximal ideals. Integral domains, principal ideal domains, unique factorization domains. Fields. Polynomial domains.

Prerequisite: Mathematics 155.

Spring, 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

Functions of bounded variation. Lebesgue and Lebesgue-Stieltjes measures and integrals, and the corresponding theorems of Fubini and Radon-Nikodym. 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, algebraic and transcendental. Adjoining a root of a polynomial, the splitting field of a polynomial. Normal and separable extensions. The Galois group of an extension. The fundamental theorem of Galois theory.
Prerequisite: Mathematics 232.

Fall, 3 credits

Mathematics 341. 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.

Both semesters, credit to be arranged

Graduate Courses

(For details see the *Graduate Bulletin*)

Analysis I, II

Complex Analysis

Algebraic Systems I, II

Algebraic Topology I

Differential Geometry

Riemannian Geometry

Logic I

Logic II

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. Study in related areas

Approved electives outside Philosophy (three semesters)

On leave for the Fall Semester 1964
**On leave for the Spring Semester 1965*

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, such as those of Aristotle, Spinoza, Kant, and William James, 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, propositions, 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., metallurgical concepts of consistency, completeness, decidability of a logical system, etc.
Prerequisite: Philosophy 161.

Mr. Collins   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. Gelber   Spring, 3 credits

[Philosophy 211. Problems of Esthetics]

This course is an introduction to Esthetics, examining the range of its problems as these emerge in recent and contemporary treatments of art in terms of its creation and appreciation.
Prerequisites: Two semesters in Humanities.

Mr. Zyskind   Fall, 3 credits
To be offered in 1965-66.

Philosophy 213. Philosophy of Literary Forms I

This course examines various philosophies of art, with special emphasis on problems of definition classification, and form in application to literature. Authors read include Plato, Hegel, Bacon, Langer, and Croce. Some imaginative works are read for illustrative purposes.
Prerequisites: Two semesters in Humanities.

Mr. Zyskind   Fall, 3 credits

Philosophy 214. Philosophy of Literary Forms II

This course is a continuation of Philosophy 213, with special emphasis on the relevance of aesthetic concepts (sublimity, tragedy, and comedy) to experience and literary works. Authors read include Aristotle, Hume, Kant, Nietzsche, Bergson, Unamuno, Santayana, and Jaspers. Some works of history and literature are read for illustrative purposes.
Prerequisites: Two semesters in Humanities.

Mr. Zyskind   Spring, 3 credits

[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 independent of the other.
Prerequisites: Two semesters in Humanities.

Mr. Gelber   Fall and Spring, 3 credits each semester
To be offered in 1965-66.

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

Messrs. 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

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

[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
To be offered in 1965-66.

[Philosophy 310. Contemporary Philosophies of Experience]

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

Mr. Sternfeld   Spring, 3 credits
To be offered in 1965-66.

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 Kenneth Burke.

Prerequisite: One semester of philosophy.

Mr. Watson   Spring, 3 credits

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

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.

Mr. Goodman   Fall, 3 credits

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

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 Professor: A. Henry Von Mechow (Acting Director of Physical Education)
Instructors: B. Edson Decker, Barbara A. Hall, Robert B. Snider

Physical Education Program

Two semesters of Physical Education will be a requirement for graduation. Two courses must be passed but no credits or grades will be given. Pass and Fail are to constitute the marking system.

Any student participating in an intercollegiate sport or a supervised intramural sport will be excused from one semester of required physical education for each full semester of participation in such sport.

Students may take courses beyond the two semester requirement but without credit.

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, Herbert R. Muether
Associate Professors: Edward D. Lambe, *Richard A. Mould, B. James Raz, Henry B. Silsbee, Clifford E. Swartz
Assistant Professors: Robert L. deZafra, 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*)

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* On leave for the Spring Semester 1965

** 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.

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.

Prerequisite: 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, 2 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.

Requisite: 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 dis-

cussion of material, resolution of problems encountered, and assessment of the student's progress.

Requisite: 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
Assistant Professor: Michael J. Parenti
Instructors: Frank E. Myers, Merton L. Reichler

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 21 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. Study 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. Parenti, Reichler   Fall and Spring, 3 credits each semester

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* *On leave for the Spring Semester 1965*

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. Scarrow, Meyers   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, 3 credits

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 pervading concerns, methods, and spirit of American thought in civic matters.

Mr. Williams   Fall, 3 credits

[Political Science 202. Problems of Marxism]

The problem 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

To be offered in 1965-66.

Political Science 210. 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. Scarrow   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

To be offered in 1965-66.

Political Science 214. British Parliamentary Democracy

Examination of the workings 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   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.

Mr. Parenti   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.

Mr. Parenti   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, innovation, and responsibility.

Mr. Schiff   Spring, 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

Political Science 391. 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   Fall, 3 credits

[Political Science 392. 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   Spring, 3 credits

To be offered in 1965-66.

Department of Psychology

Professor: Harry I. Kalish (Chairman)
Associate Professor: Lewis Petrinovich
Assistant Professors: Elio Bruschi, 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* 152. *(Advanced General Psychology)*
> *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 152. Advanced General Psychology

A more intensive treatment of the basic psychological processes covered in Psychology 101. It is recommended that majors enroll in this course immediately following Psychology 101. Laboratory demonstrations illustrating several classical experiments will be presented in class. The student will also be afforded an opportunity to participate in the presentation of the demonstrations.

Prerequisite: Psychology 101.

Staff   Fall and Spring, 3 credits

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 non-parametric techniques. Two lecture sections and a one-hour laboratory each week.

Prerequisites: Psychology 101, 152.

(Psychology 152 may be waived in certain cases.)

Mr. Kalish   Fall and Spring, 3 credits

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, 152 and permission of the instructor.

Messrs. Petrinovich, Weiss   Fall and Spring, 4 credits

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. A number of laboratory problems will give the student experience in collecting, analyzing, and reporting data that describe behavior in social situations.

Prerequisites: 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

Mr. Bruschi   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. Kalish, Goldfried   Fall and Spring, 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, 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 credit each semester

Psychology 340. Physiological Psychology

An examination of the physiological correlates of behavior, with emphasis on the relationship of the internal environment to external behavior. Experiments dealing with the various sense modalities, motor functions, learning, memory, and motivation will be presented.

Prerequisites: Psychology 101, 152.

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, 152, 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: Norman Goodman, Guenther Roth

Requirements for the Major in Sociology

In addition to the general University requirements for the Bachelor of 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 interdisciplinary 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 Sociology

Sociology 201 (Research Methods in Sociology)
Sociology 361 (Development of Sociology to the Year 1900)
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 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 205. Social Problems, 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.

Mr. Roth   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 proconditions of economic development, and of the social implications of automation in highly industrialized countries.

Mr. Roth   Spring, 3 credits

Sociology 238. Self, Society, Culture and Mental Health

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

Mr. Nelson   Spring, 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. Roth   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.

Mr. Roth   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

particular, 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.

Staff   Spring, 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. Nelson and/or Mr. Roth

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. 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 facilities; 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. Development of Sociology to Year 1900

A survey of the main currents in the development of theories and empirical investigation of society, culture, personality. The authors studied

include Adam Smith, Saint-Simon, Comte, Marx, Maine, Burkhardt, Tylor, Frazer, Durkheim, Dilthey, Simmel, Pareto, Freud, Weber.

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. Authors studied include C. H. Cooley, G. H. Mead, B. Malinowski, R. Linton, T. Parsons, R. K. Merton, 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, engineering 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 through 5 below.

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

English 101, 102	6 credits
Humanities	12 credits

Social Science (This requirement may be satisfied by the successful completion of courses from 3 of the 6 Social Science Departments.)   12 credits

Physics 101, 102, 151, 152   16 credits

Chemistry 101, 102   8 credits

Mathematics 102, 103, 155, 156   12 credits

Physical Education   2 semesters

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

2. Quantity requirement: Every student is required to earn at least 128 credits.

3. Quality requirement: A cumulative grade point average of 2.0 for all courses taken at the State University at Stony Brook is required of every student.

4. Elective requirement: 6 credits are required in the junior year in the areas of the humanities, including foreign languages, the social sciences, or the biological sciences.

5. 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.

6. Every student admitted without advanced standing is required during the freshman year to register for:
English 101, 102
Mathematics 102, 103
Physics 101, 102
Two semesters of Social Science
Two semesters of Humanities

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 (students selecting only one semester of Political Science must take Political Science 101)

Psychology 101, and any Psychology course for which the prerequisites have been fulfilled

Sociology 101, 102

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

Humanities 103, 104, 105, 106, 111, 112, 113, 114, 115, 121, 122, 123

No more than *six* hours of work can be taken in any one of the following areas:

Fine Arts (Humanities 111, 112, 113, 114, 115)
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.

7. Exemptions: On the recommendation of the Chairman of the course, a student is exempted without credit from any of the course requirements specified in Sections 1 or 6 above.

Undergraduate Sequence

First Year

1st Semester	Credits	2nd Semester	Credits
Humanities	3	Humanities	3
English 101	3	English 102	3
Social Science	3	Social Science	3
Mathematics 102	3	Mathematics 103	3
Physics 101	4	Physics 102	4
	16		16

Second Year

1st Semester	Credits	2nd Semester	Credits
Humanities	3	Humanities	3
Social Science	3	Social Science	3
Mathematics 155	3	Mathematics 156	3
Physics 151	4	Physics 152	4
Chemistry 101	4	Chemistry 102	4
Graphic Arts (ESG 151)	1	Introduction to Digital Computers (ESG 162)	2
	18		19

Third Year

1st Semester	Credits	2nd Semester	Credits
ESG 201		ESG 202	
Thermodynamics I	3	Thermodynamics II	3
ESG 251		ESG 252	
Electrical Sciences I	3	Electrical Sciences II	3
ESG 221		ESG 222	
Engineering Analysis I	3	Engineering Analysis II	3
ESG 211		ESG 212	
Engineering Lab. I	3	Engineering Lab. II	3
ESG 261 Mechanics I	3	ESG 232	
Elective (Non Tech)	3	Material Sciences I	3
	—	Elective (Non Tech)	3
	18		—
			18

Fourth Year

1st Semester	Credits	2nd Semester	Credits
ESG 353		ESG 323	
Electrical Sciences III	3	Engineering Analysis III	3
ESG 363		ESG 334	
Mechanics II	3	Material Sciences III	3
ESG 333		ESG 305	
Material Sciences II	3	Heat & Mass Transfer	3
ESG 364		ESG 341	
Mechanics III	3	Engineering Design II	5
ESG 340		Elective (Technical)	3
Engineering Design I	1		—
Elective (Technical)	3		17
Elective (Technical)	3		—
	—		
	19		
	—		

Courses of Instruction

Course designations are abbreviated according to the following scheme:

ESG: Required Undergraduate Courses

ESA: Courses offered by the Department of Engineering Analysis

ESE: Courses offered by the Department of Electrical Sciences

ESM: Courses offered by the Department of Material Sciences

EST: Courses offered by the Department of Thermal Sciences

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 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. At each stage the student studies and discusses the work of such artists and scientists as Giotto, Da Vinci, Dürer, Fulton, and Morse.
Prerequisite: None.
Three laboratory hours.
To be offered both semesters.

1 credit

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.

2 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 152, Chemistry 102.

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.

3 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.

3 credits

ESG 221. Engineering 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. Engineering 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: Engineering Analysis I.

3 credits

ESG 232. Material Sciences I

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 152.

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: Engineering Analysis I.

3 credits each semester

ESG 261. Mechanics I: Particle and Rigid Body Mechanics

Fundamentals of particle and rigid body mechanics: review of vector algebra and vector calculus. Force systems, statics and kinematics of particles and rigid bodies, dynamics of a single particle and of systems of particles including rigid bodies, vibration theory and Lagrange's equations of motion.
Prerequisites: Mathematics 156, Physics 152.

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.
Prerequisites: Mechanics III, Thermodynamics II.

3 credits

ESG 323. Engineering 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: Engineering Analysis II.

3 credits

ESG 333. Material Sciences II: 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 334. Material Sciences III: Electrical and Magnetic Properties

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 II.

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.

Prerequisite: Electrical Sciences II.
Corequisite: Engineering Analysis II.

3 credits

ESG 363. 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.

Prerequisites: Engineering Analysis I, Mechanics I.

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: Engineering Analysis II, Mechanics II.

3 credits

Department of Electrical Sciences

Professor: Sheldon S. L. Chang (Chairman)
Associate Professor: Richard B. Kieburtz
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 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 Engineering Analysis

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

Departmental Electives

ESA 315. Random Processes in Engineering Systems

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: Engineering Analysis I.

3 credits

ESA 316. Special Functions of Engineering Analysis

A study of the more common higher mathematical functions which are required for the analytical solution of engineering 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: Engineering Analysis II.

3 credits

Department of Material Sciences

Professor: Sumner N. Levine (Chairman)
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 152.

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: Quantum Theory of Matter.

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

Department of Thermal Sciences

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

Departmental Electives

EST 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

EST 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

EST 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

EST 375. Viscous Fluids

The Navier-Stokes equations are derived and some exact solutions obtained. Topics include low Reynolds number behavior, lubrication theory, flow through porous media, asymptotic behavior at large Reynolds numbers, boundary layers, wakes and jets, and laminar flow instability.
Corequisite: Mechanics III.

3 credits

EST 399. Kinetic Theory of Gases

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

On leave for the Academic Year 1964/65

3 credits

The Computing Center

Director: Professor Aaron Finerman
Manager: Mr. Sol Broder

The Computing Center serves the needs of the entire student body and faculty in the field of electronic computers. The objectives of the Center are many. It not only introduces students to modern electronic computers 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 student records, registration studies, and accounting procedures. In addition, the Center performs research investigations in the numerous areas of the computing sciences such as programming systems, numerical techniques, and new applications.

The present equipment consists of an IBM 7040/1401 computing system, 10 magnetic tape units and associated peripheral equipment.

Academic Regulations

Courses are to be chosen in accordance with the regulations of an established degree program and are to be approved by the student's academic advisor. However, it is the student's responsibility to ascertain that he meets all the requirements for graduation.

A minimum registration of 15 semester hours is required of undergraduates. Students may register for less than 15 semester hours or more than the normal five course load only upon receiving permission from the Committee on Academic Standing. All formal petitions for dropping or adding courses must originate with the Registrar's Office, and must be presented on prescribed forms obtainable there. Such changes may be requested only during the first two weeks of a semester. (If the dropping of courses reduces the student's load below 15 hours, permission of the Committee on Academic Standing must be obtained.)

A student who wishes to withdraw from a course may petition the Committee on Academic Standing for the grade of "W" (Withdrawal) at any time after the first two weeks of classes and prior to the last four weeks of a semester. The appropriate forms may be obtained at the Registrar's Office. The Committee may grant such a petition when the withdrawal does not reduce the student's program below fifteen credit hours for the semester, or when in the judgment of the Committee unusual circumstances, such as physical disability, make it impossible for the student to fulfill his academic obligations.

Registration after the close of the regular registration period requires permission of the Registrar as well as payment of a fee of $2.00. Registration is not permitted after the end of the second week of classes, and is not complete until financial arrangements regarding tuition and fees satisfactory to the Business Office have been made.

Students wishing to change a major must file a "change of major" form with the Registrar.

Withdrawal from the University, for any reason, will be recorded only upon submission of a completed "Withdrawal from the University" card to the Registrar. These cards may be obtained in the Registrar's Office. The date upon which this card is received by the Registrar, and not the last day of class attendance, is considered the

official date of the student's withdrawal. Non-attendance, or notification of the instructors, does *not* constitute formal withdrawal. Students withdrawing before the first day of the examination period at the end of the semester will receive the grade of "W" 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 automatically be assigned the grade of F in each course for which they are registered.

Requests for re-admission to the University should be addressed to the Registrar. If the student has attended an institution of higher learning since his last attendance at the State University at Stony Brook, an official transcript of grades must be forwarded before a request for re-admission can be considered.

A student who wishes to take courses during the summer at other institutions for transfer credit applicable to his degree should initiate his request with his advisor.

A student who wishes to attend a course as an auditor must obtain written permission of the instructor, and must file it with the Registrar. Only regularly registered students may audit courses, and no credit may be earned by auditing. However, attendance of a single session or brief period of a course for which the student is not registered requires only the informal approval of the instructor.

The University reserves the right to alter academic regulations as well as fees at any time, and to cancel any course offered if conditions warrant cancellation.

Assignment of Grades

A grade is assigned at the end of each semester's work. The examination given at the end of the semester contributes substantially to the grade. In semester courses (such as *English* 101, 102) the successful completion of the first semester is a prerequisite to enrollment in the second semester course.

Marks assigned upon completion of a course are: A (Superior); B (Good); C (Satisfactory); D (Minimum Passing); and F (Failure).

In addition to these grades, the following marks may also be awarded at the end of a semester:

I (Incomplete) indicates failure to complete assigned work other than the final examination. This mark is given only on the request of the student and at the discretion of the instructor. The

period allowed for completion of the work and removal of the Inc. will be set by the instructor but may not extend beyond the four weeks following the last day of the semester in which the course was taken. In exceptional circumstances this period may be lengthened by the Dean of Students with the consent of the instructor. Work not completed in the prescribed time will be marked F in determining the final grade.

X (Absence) indicates work incomplete because of absence from the final examination. This mark is automatically awarded by the instructor when the student fails to appear for the final examination. An absence from a final examination is excusable only by the Dean of Students with the concurrence of the instructor and ordinarily only for cogent reasons such as physical incapacity. If the absence is not excused, the instructor will count the student's performance on the final examination as an F.

W (Withdrawal) indicates withdrawal from the University, as explained in the previous section.

R (Registered) is given at the end of the first semester of a year course, e.g., *Biology 391-392* or *Sociology 391-392*.

J (Audit) indicates a student has attended a course as an auditor. No credit is given for auditing a course.

Academic Standing

The State University of New York at Stony Brook requires for graduation a scholarship average of C, which represents a cumulative grade-point average of 2.0.

For the purpose of determining scholarship averages the letter grades have been assigned the following values: A, 4 points; B, 3 points; C, 2 points; D, 1 point; F, no points. (Grades designated as *Absence, Incomplete* and *Withdrawal* are not included in the scholarship 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 credit hours which the course carries; the total number of points earned in all courses is then divided by the total number of credit hours for which the student has been registered.

The minimal cumulative averages that will allow a student good academic standing are the following:

1.75 at the completion of the freshman year
1.90 at the completion of the sophomore year
2.00 at the completion of the junior year

Students with cumulative averages of at least 1.50 but less than 1.75 at the end of the freshman year normally will be admitted to the sophomore class on a probationary basis; similarly, the cumulative grade-point range for probationary admission to the junior class is 1.75 to 1.90 at the end of the sophomore year, and to the senior class, 1.90 to 2.00 at the end of the junior year.

A student normally will be suspended if his cumulative average is less than 1.50 at the end of the freshman year, 1.75 at the end of the sophomore year, or 1.90 at the end of the junior year.

Student Welfare and Activities

Advisory and Counseling Services

A faculty advisor is assigned to each student, who is encouraged to consult this advisor 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. A health-insurance program (see "Financial Information" page 000) 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 Organizations

The Student Polity, to which all student belong, allows them to govern themselves to a large extent in extra-curricular matters. The Executive Committee of Polity, composed of elected members, approves 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, Student Christian Association. The Student Polity also sponsors art exhibits, concerts, lectures and films, and operates its radio station, WUSB.

Housing

Unmarried students who will not live at home during the school year are required to live in university residence halls. In 1964-65 housing for approximately 1,200 men and women will be available. All rooms at present provide each student with a bed, mattress, bureau, study desk and chair, and closet. Throughout the residence halls there are many lounges and public areas.

Board consisting of 21 meals a week is provided for resident students; non-resident students may purchase meals in the university dining hall. (See "Financial Information" for Residence charges.)

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 guidance and short term psychotherapy, referral to outside agencies when needed, personality evaluation and diagnosis, as well as evaluation of intellectual capacities. The purpose of Psychological Services is to be of help to students who have personal problems or who are experiencing considerable difficulty in adjusting to university life and its demands.

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*	22.50		22.50
Student Activity Fee	50.00		50.00
Identification Card	2.00		2.00
Damage Deposit	10.00		10.00
Telephone Deposit	15.00		15.00
Orientation (Freshmen Only)**	5.00		5.00
Graduation (Seniors only)	15.00		15.00

	1st Qtr.	2nd. Qtr.	1st. Qtr.	2nd Qtr.	Total
Room					
Double Occupancy	$ 90.00	$ 75.00	$ 75.00	$ 75.00	$315.00
Single Occupancy	110.00	80.00	80.00	80.00	350.00

(Single occupancy may be approved in exceptional instances)

* Student health insurance fee waived if proof of both hospital and medical insurance is presented prior to registration.
** Orientation fee may be waived in part, or in full.

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

Board
(21 Meal
Plan)***   125.00   125.00   125.00   125.00   500.00
(Other plans may be available)

Students who register after the official registration period must pay a Late Registration fee of $5.00

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

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; which ever 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/or 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 State University Fees. A schedule for 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.

*** Subject to change, since board costs are based on the Cost-of-Living Index.

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 deposit is due and payable on the same basis as the Preadmission Deposit. However, the Advance Room Deposit is refundable if application is made in writing before July 1st of the year in which the student was accepted.

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. Washing machines and dryers are available in the Residence Halls.

Each room in the Residence Hall is provided with a private telephone. A deposit of $15.00 (listed in the Schedule) must be paid prior to taking up residence. If no telephone bills are outstanding upon graduation or withdrawal from the University, this deposit will be refunded.

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 to 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 attendance. Similarly, a graduate student may qualify if he was a resident from the beginning of his last year of college attendance until the time he matriculated 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 calendar year. For married students, at the graduate and undergraduate level, this includes 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.

Scholar incentive holders 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 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. 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 College. These are sent from the Regents' Scholarship Center in Albany. Deferred payment arrangments can be made only when students have their notices.

Scholarships for Children of Deceased or Disabled Veterans of $1,800. each are granted by New York State to eligible applicants on the basis of an annual scholarship examination. Application should be made to 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.

The State of New York, through the New York Higher Education Assistance Corporation, enables needy students to borrow money to help finance their higher education. The maximum amount which may be borrowed in any one academic year is $1,000. The Corporation guarantees loans made by participating banks in New York State. Application forms for these loans may be obtained from the Dean of Students, from a local cooperating bank, or by writing directly to the New York Higher Education Assistance Corporation, State Education Building, Albany, New York.

The United States Government also makes available student loan funds through the National Defense Education Act. Information on these loans, and forms for application may be obtained from the Dean of Students.

When approved by the Business Officer of the University, scholarships held by State University students may be applied directly to University expenses such 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 his paying his expenses when due.

Students from the member States of the Organization of American States who wish to pursue graduate studies may apply at the same time that they seek 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: 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.
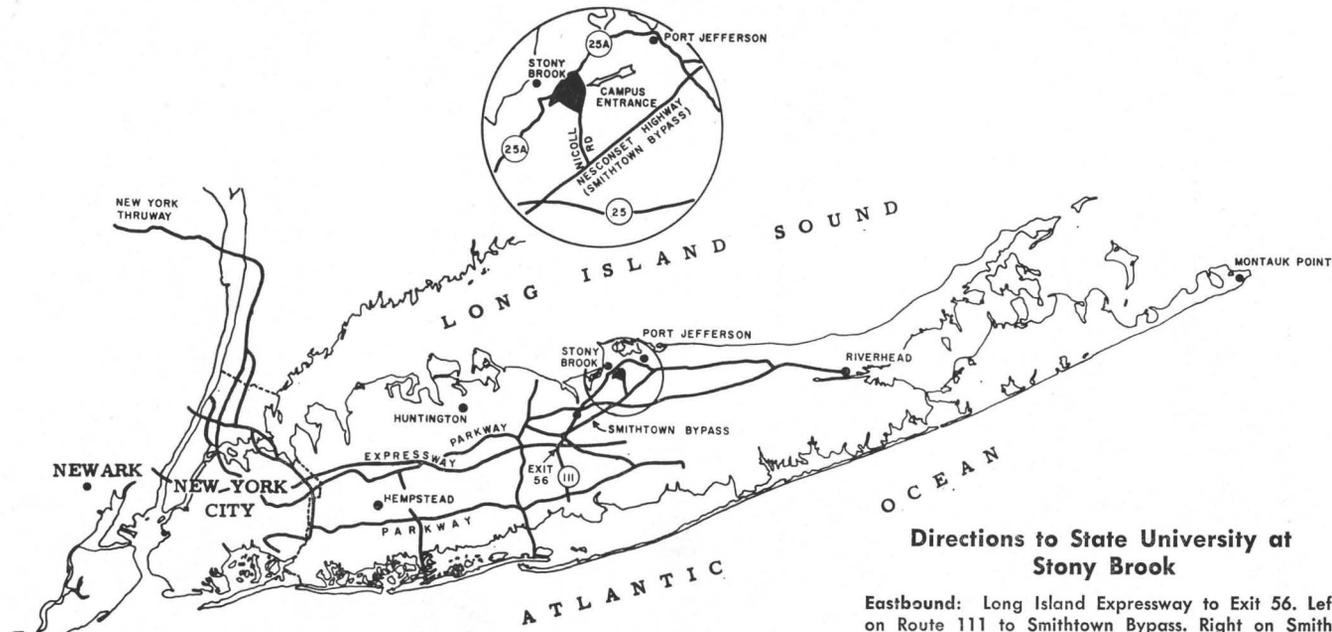
Directions to State University at Stony Brook

Eastbound: Long Island Expressway to Exit 56. Lef on Route 111 to Smithtown Bypass. Right on Smith town Bypass (crossing Jericho Turnpike six miles. Left on Nicoll Road. Left on to Campus. (Smithtown Bypass becomes Nesconset-Port Jefferson Highway after cross-ing Jericho Turnpike.)

Westbound: Nesconset-Port Jefferson Highway or Route 25A to Nicoll Road. Right or left, respectively, to the "State University" sign.

TO SMITHTOWN

ROUTE 25 A

CAMPUS BUILDINGS

1	HUMANITIES	8	HEATING PLANT
2	CHEMISTRY	9	PUMPING STATION
3	PHYSICS	10	ELECTRIC S.S.
4	BIOLOGY	11	ENGINEERING
5	LIBRARY	27	INFIRMARY *
6	GYMNASIUM		
7	SERVICE		

AF   ATHLETIC FACILITIES
TC   TENNIS COURTS
NG   NORTH ENTRANCE GATE
SG   SOUTH ENTRANCE GATE
RR   RAILROAD STATION,
     STONY BROOK

* UNDER CONSTRUCTION

RESIDENCE HALLS

30	G	33	H
31	AS	34	JS
32	AN	35	JN

PARKING AREAS

A1	G1	R1
A2	G2	
A3		

TO STONY BROOK

WEST ST

SOUTH DRIVE

MIDDLE ROAD

NORTH DRIVE

CENTER DRIVE

NORTH DRIVE

EAST CIRCLE ROAD

LOOP ROAD WEST

LOOP ROAD EAST

TO PORT JEFFERSON

TO NESCONSET HWY

NICOLL ROAD

SCALE IN FEET
0   500   1000   1500

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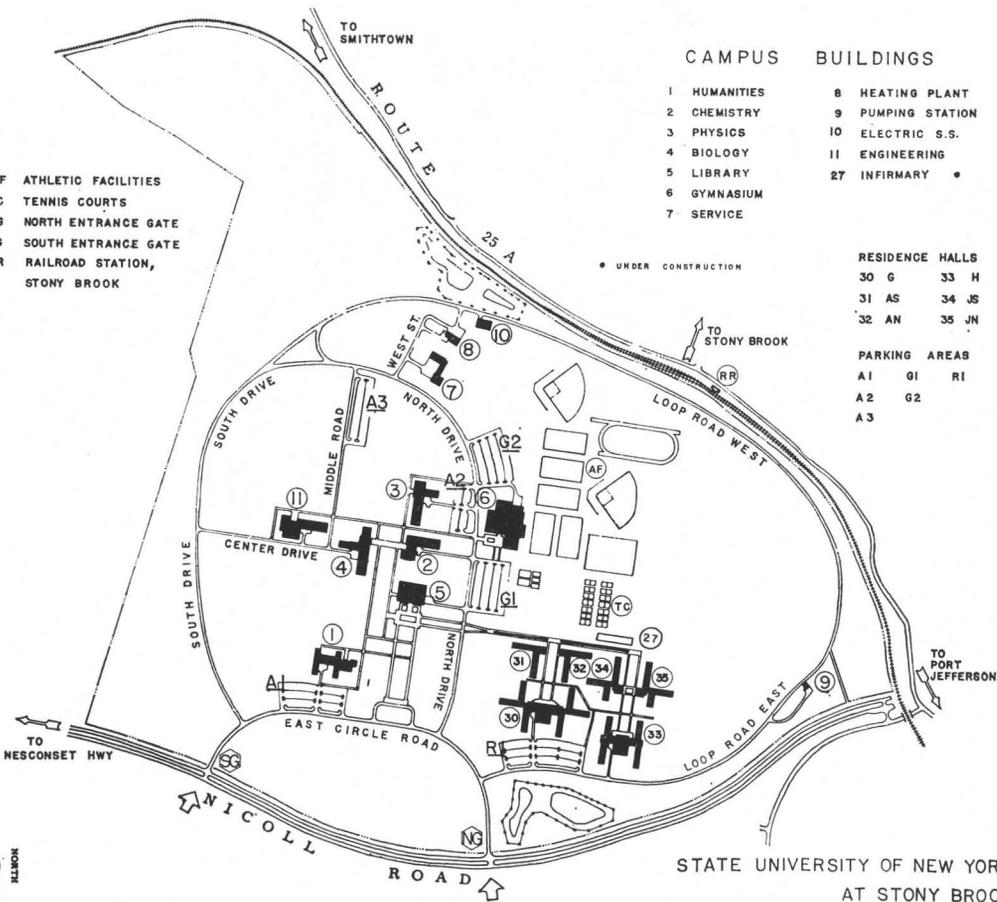
STATE UNIVERSITY OF NEW YORK
AT STONY BROOK
STONY BROOK LONG ISLAND
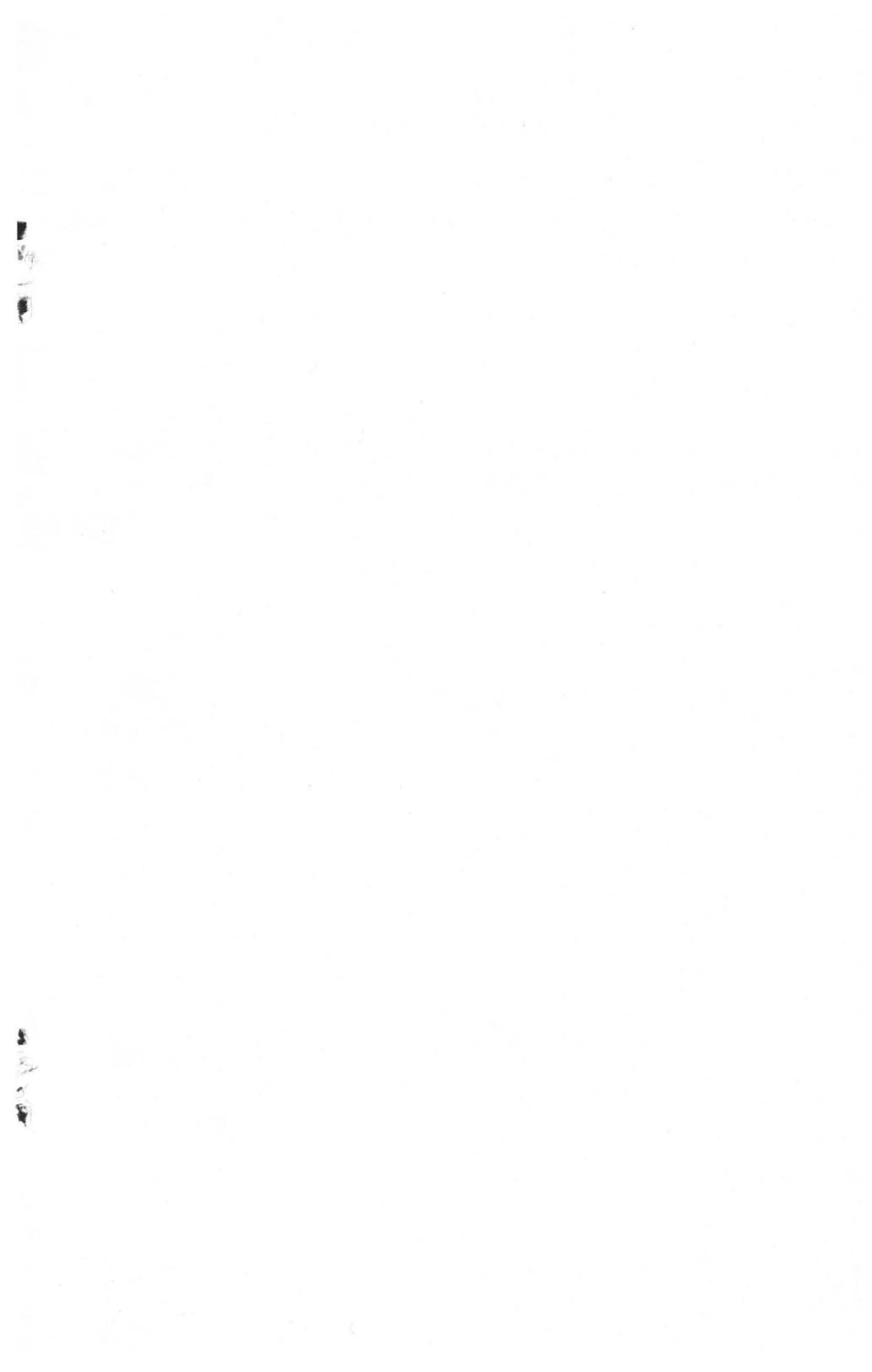
STATE UNIVERSITY OF NEW YORK

Central Administrative Office: Albany 1, N. Y.

UNIVERSITY CENTERS
State University at Albany
State University at Buffalo
State University at Stony Brook

MEDICAL CENTERS
Downstate Medical Center at Brooklyn (New York City)
Upstate Medical Center at Syracuse

GRADUATE SCHOOL
Graduate School of Public Affairs at Albany

COLLEGES
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

Harpur College at Binghamton
College of Forestry at Syracuse University
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 Institutes at: Alfred   Delhi
Canton   Farmingdale
Cobleskill   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