A black and white photograph of a grand, classical building facade. The building features a prominent portico with tall, fluted columns. Above the columns is a pediment containing a relief sculpture. The building is partially covered in ivy, particularly on the left side and around the windows. In the foreground, there are trees and a large, ornate urn on a pedestal. The overall scene is well-lit, suggesting a sunny day.

*Official Bulletin*

UNDERGRADUATE  
STUDIES  
1960 - 1961

# The University of Rochester

COLLEGE OF ARTS & SCIENCE • COLLEGE OF ENGINEERING • COLLEGE OF EDUCATION  
SCHOOL OF BUSINESS ADMINISTRATION • INSTITUTE OF OPTICS  
DEPARTMENT OF NURSING

*Bulletin*  
*of*  
*Undergraduate*  
*Studies*

*1960-61*



# THE UNIVERSITY

COLLEGE OF ARTS AND SCIENCE • COLLEGE OF EDUCATION • SCHOOL OF BUSINESS  
DEPARTMENT OF NURSING

SEPTEMBER, 1960

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*of* ROCHESTER

ADMINISTRATION • COLLEGE OF ENGINEERING • INSTITUTE OF OPTICS

# Calendar

## *Fall 1960*

September 13— <i>Tuesday</i>	Registration begins. (Registration takes place in the Men's Gymnasium. See section on Registration for detailed information.)
19— <i>Monday</i>	Instruction begins
October 7— <i>Friday</i>	Last day for payment of undergraduate tuition
November 23— <i>Wednesday</i>	Thanksgiving recess begins at noon
28— <i>Monday</i>	Classes resume
December 17— <i>Saturday</i>	Christmas recess begins at close of classes
January 3— <i>Tuesday</i>	Classes resume
14— <i>Saturday</i>	Last day of classes
17— <i>Tuesday</i>	Term examinations begin
27— <i>Friday</i>	Term examinations end

## *Spring 1961*

February 1— <i>Wednesday</i>	Instruction begins for Spring Semester
17— <i>Friday</i>	Last day for payment of undergraduate tuition
March 25— <i>Saturday</i>	Spring Recess begins at close of classes
April 3— <i>Monday</i>	Classes resume
May 19— <i>Friday</i>	Last day of classes
22— <i>Monday</i>	Term examinations begin
30— <i>Tuesday</i>	Memorial Day Holiday
June 2— <i>Friday</i>	Term examinations end
11— <i>Sunday</i>	Commencement

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## EDUCATIONAL

# *Aims and Purposes*

THE University of Rochester offers broad educational opportunities in a wide variety of fields in its several Schools and Colleges. These include graduate and undergraduate work in the College of Arts and Science, the School of Business Administration, the College of Engineering, the College of Education, and University School of Liberal and Applied Studies, all on the River Campus; and in the Eastman School of Music, the School of Medicine and Dentistry, and the Department of Nursing.

In the College of Arts and Science, a diversified program of liberal education—the central core of the University's activity and services—is available to qualified students. Around this core have grown up during more than a century of the University's development the Schools and Colleges for professional and advanced study.

All full-time undergraduate students on the River Campus enroll in the College of Arts and Science as freshmen, and a majority remain in it for all four years of college. Others, however, transfer at the end of their sophomore year to one of the professional units for specialized study in Business Administration, Engineering, Education, or Nursing.

No matter which College they are enrolled in, all are members of one River Campus student body, under the same student government and sharing the same residence and dining halls and the many extra-curricular phases of campus life.

Educated men and women in the modern world must have command of exact knowledge in some special field, suitable to their interests and competence, to equip them for useful occupations in their community and nation. They must also have the opportunity to learn and understand their wider responsibilities for enlightened leadership as citizens in a complex social order. In the light of these demands, liberal education at Rochester is designed to evoke clarity of thought, direction of purpose and integrity of character. Ideally, of course, such qualities should remain as permanent acquisitions of persons enjoying the privilege of higher education.

To assist the student in developing these qualities, the University serving in a free society places its faith and emphasis on these main objectives:

1. **A Liberal Education.** *Knowledge:* The University believes that a liberal education should offer students such knowledge of their cultural heritage as to enrich their experience and provide them with sources of wisdom for the future, to comprehend the nature of the physical world, and to appreciate the problems of the social, political, and economic world in which they live.

2. **A Professional Education.** *Specialization:* In addition to a liberal education, the University aims to train students in special professional studies based on a core of the humanities but with intensified work in various fields which will enable them to be versatile in the application of their knowledge, well received by other universities for advanced work, and well equipped to qualify for responsible positions in the productive life of their communities.

3. **Preparation for the Future.** *Character:* The most important aim of any university is to give students such training as will enable them to face the future without fear. The University hopes to develop in its graduates free, inquiring minds, released from prejudices, able and willing to think in accordance with facts and with the laws of inference, to choose wisely, to feel with discrimination and sympathy and ready to assume their responsibilities to society. The union of knowledge, reason, sympathy, and an appreciation of moral and ethical values in the integrated personality is the final goal of education.





# *The College Setting*

THE University of Rochester, founded in 1850, draws strength from its deep roots in the past, but at the same time it has a vitality and flexibility that grows from its constant alertness to changing conditions. It is a privately-controlled, gift-supported, non-denominational institution.

The University is outstanding by plan, not chance. It is a qualitative institution, not so interested in size as in offering the best possible education to its students. Its heart, and its parent school, is the coeducational College of Arts and Science, located on the residential River Campus in a picturesque setting on the Genesee River, the broadest stretch of which flows past the campus for a mile.

The River Campus Schools and Colleges are moderate in size. The current combined undergraduate enrollment in the College of Arts and Science, the School of Business Administration, the College of Education, and the College of Engineering is approximately 1,950 students, who come from many parts of this country and from foreign lands. This number includes about 1,250 men and 700 women. Seventy-five per cent of the students live in the campus residence halls.

Adjacent to the River Campus is the 650-acre Genesee Valley Park on the outskirts of Rochester, where broad, rolling meadows, groves, creeks for canoeing, two eighteen-hole golf courses, ice skating rinks and trails enhance the rustic surroundings.

Since its early days, The University of Rochester has been known for the high quality of its educational program and faculty. Its accomplishments and objectives have won generous support from many benefactors, notably the late George Eastman, founder of the Eastman Kodak Company, and its endowment is one of the strongest of any university in the country. This fact has enabled it not only to provide exceptional buildings and equipment for teaching, research, and campus living, but more important, to attract an outstanding faculty.

The undergraduate program combines the advantages of a moderate-sized college with the broadening influence and intellectual vigor of university relationships. In a community of scholars such as The University of Rochester, the distinguished faculties in music, medicine and other divisions of the University add greatly to the strength and effectiveness of River Campus Schools and Colleges.

Programs of study offered at the River Campus are Liberal Arts, Mechanical, Chemical and Electrical Engineering, Industrial Management, Physics, Optics, Chemistry, Biology, Geology, Astrophysics, Economics, Business Administration, Accounting, Education, and Nursing.

Other divisions of the University are the world-famous Eastman School of Music, which has its own buildings and residential campus but maintains a close relationship with the College of Arts and Science; the equally renowned School of Medicine and Dentistry and the Department of Nursing at the University's Medical Center adjacent to the eighty-seven acre College campus; University School of Liberal and Applied Studies, and the Memorial Art Gallery. The University is fully accredited by the Middle States Association of Colleges and Secondary Schools, and is a member of the Association of American Universities, a select group of the nation's leading graduate schools in this country and Canada.

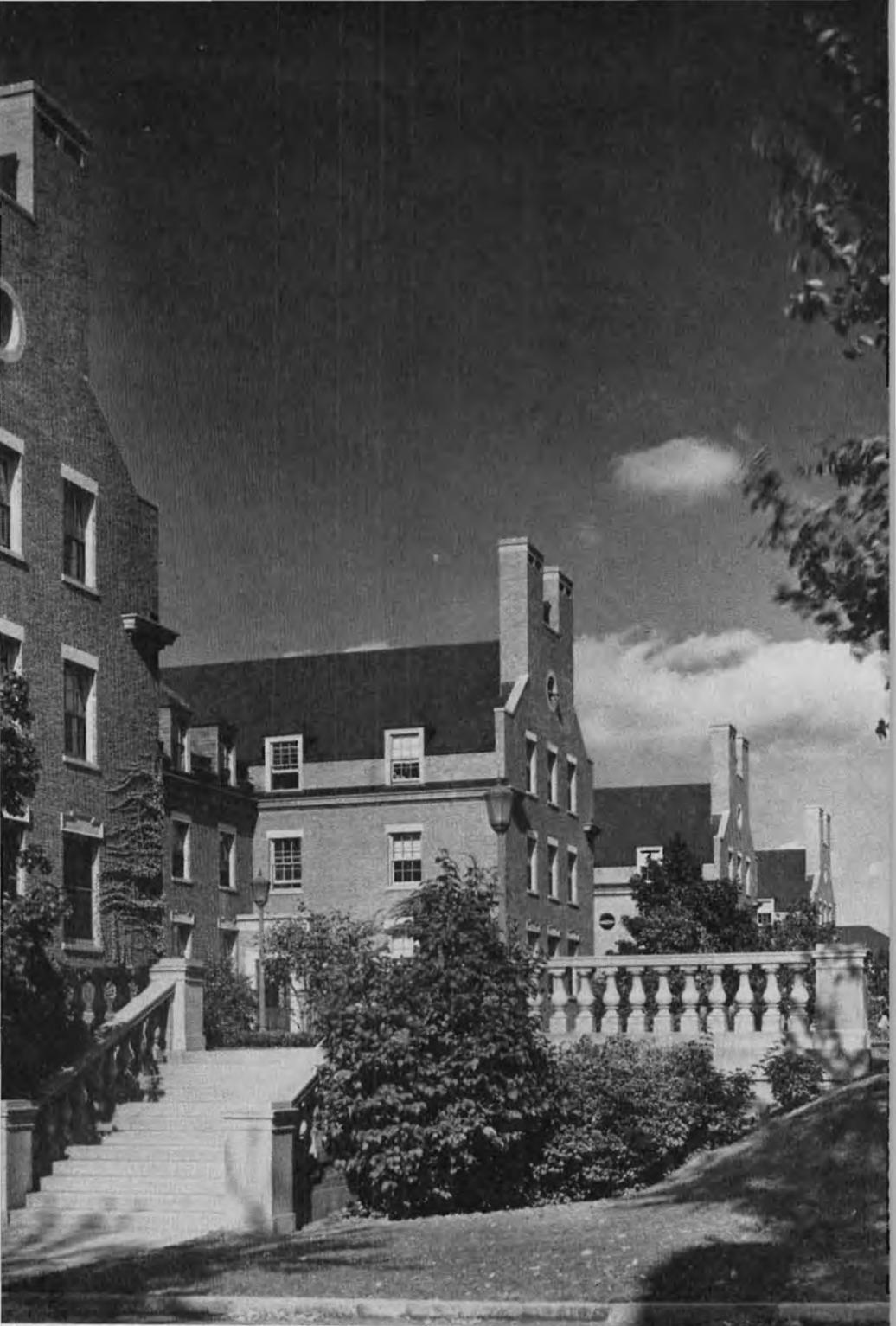
The total University acreage at the River Campus is 245, including the campuses of the College and the Medical Center and 128 acres of land for future development.

The River Campus is situated on high rolling ground that has permitted striking landscape and architectural treatment. It is unusual in the harmony and attractiveness of the design and arrangement of buildings. All academic structures are in the Georgian and Greek Revival styles of architecture with Doric or Ionic columns. Classroom and laboratory buildings are arranged for the most part around the spacious Eastman Quadrangle. The Quadrangle, on the highest ridge of the campus, is dominated at its head by the Rush Rhees Library with its massive tower, and faces the Genesee River at its open end. In the 185-foot library tower is the Hopeman Memorial Chime of nineteen bells.

Residence halls for men and fraternity houses on the lower campus are in the warm, less formal Georgian style. The new Women's Residence Halls and physical education buildings, one of the finest women's educational centers in the country, are situated on a knoll in the northeast section of the campus. Although the Residence Halls are of contemporary design, their brick and limestone construction harmonizes with the other campus structures. Another attractive new building is the Men's Dining Hall and Faculty Club on the lower campus.

Although its secluded location at the southwest boundary of the city isolates it from the bustle of the town, the University enjoys many advantages from its relations with the community. Rochester is known as one of the great music centers and as a city of high cultural and civic aims. The Rochester Philharmonic Orchestra, the Civic Orchestra, and frequent concerts by Eastman School of Music symphonic and chamber music ensembles, choruses, opera groups, instrumentalists and vocalists provide a wealth of music throughout the year. At the School's magnificent Eastman Theatre, regular concerts and ballet performances are given by the world's foremost artists and visiting orchestras such as the Boston Symphony and the Metropolitan Opera Company on tour. Excellent museums, libraries, theatres, churches and schools add to the city's appeal. Rochester is nationally known for its many beautiful parks, and Lake Ontario at the northern edge of the city affords good swimming and sailing. Nearby are a number of fine state and county parks, and the scenic beauties of the Genesee Country, the Finger Lakes region, and the Bristol Hills attract visitors from all parts of the nation.







## *Buildings and Equipment*

**Rush Rhees Library.** Books are the indispensable tools of student and teacher. The University Library has a total collection of approximately 675,000 volumes and subscribes to 3,500 periodicals. The main collection is in Rush Rhees Library, named for Rochester's third President, which houses 480,000 volumes and will accommodate nearly a million. The several libraries of the University are under the same administration as Rush Rhees Library and are joined by a delivery system which makes any book in the collection available to each campus. Rush Rhees Library's rich resources embrace not only the commonly used books for assigned and collateral reading in courses but a number of important collections and source material in many fields, as well as

current periodicals. The collections on American political history are particularly outstanding. These include the papers of William H. Seward, President Lincoln's Secretary of State, Thurlow Weed, nineteenth century political leader, and former Governor Thomas E. Dewey, who placed all of the papers dealing with his public career on permanent deposit in Rush Rhees Library when he left political life in 1954.

In the Treasure Room are the rare books, first editions, priceless manuscripts and incunabula which lure the book-lover, collector and scholar. Among them are early printed books, significant editions of several American authors, collections on Mark Twain, Washington Irving, the English drama, and the Hoeing Collection of books on the Restoration and eighteenth century English literature.

A noteworthy feature of the Library is the Welles-Brown Room, a spacious, tastefully-appointed room containing choice editions of the classics and a selection of the best work of modern authors. It is designated as a browsing room to encourage the students' recreational reading and love of fine books.

The Sibley Music Library at the Eastman School of Music also is available to students of the River Campus colleges. It contains one of the most complete music collections outside the Library of Congress, and is particularly rich in its manuscript collections, some of which are beautifully illuminated. Holograph scores include works of Mozart, Beethoven, Liszt, Brahms, Debussy, Schumann, as well as such noted American composers as Chadwick, MacDowell, Copland, Harris, Anthel, and Hanson.

Other University libraries are the Memorial Art Gallery Library and the Edward G. Miner Library at the School of Medicine and Dentistry.

Grouped around Eastman Quadrangle, so named to perpetuate the name of the University's great benefactor, George Eastman, with Rush Rhees Library standing at its head, are these four structures:

**Morey Hall**, named for William Carey Morey of the Class of 1871, for forty-eight years a distinguished Professor of History and Political Science. It houses the classrooms and offices of many of the liberal arts departments, the Dean of Students, the administrative offices of the College of Arts and Science, and the *Laboratory of Psychology*.

**Lattimore Hall**, which houses the Department of Chemistry, named for Samuel Allan Lattimore, Professor of Chemistry for forty-two years. A large new wing was completed in the fall of 1949 for research laboratories, facilities for physical and organic chemistry, the chemistry library, and the national editorial offices of the *Journal of the American Chemical Society*, which were moved to the Rochester campus on January 1, 1950.

**The John J. Bausch-Henry Lomb Memorial Laboratory**, housing the Department of Physics and the *Institute of Optics*. It was named in recognition of a generous gift by the families of the founders of the Bausch & Lomb Optical Company.

Special facilities for research in Physics and Optics include a cyclotron capable of producing eight-million-volt protons for nuclear research.

A large cyclotron and an associated laboratory for the purpose of producing 240-million-volt protons and investigating nuclear phenomena at these energies were completed early in 1949. This project is supported by the United States Atomic Energy Commission.

**The Chester Dewey Building**, bearing the name of the University's first Professor of Chemistry and Natural Science. It is shared by the Departments of Biology, Geology, Geography, Sociology, and the offices of the College of Education.

To the south of Eastman Quadrangle are the following buildings:

**Gavett Hall** of the College of Engineering, with a large addition erected in 1947, providing laboratory, drawing room, classroom and shop facilities for engineering instruction in the chemical, electrical, mechanical and metallurgical fields. The laboratories include heat power, materials testing, fuel, chemical engineering, metallurgical, industrial X-ray, electrical machinery, electrical measurements, electronic, vibration, and stress analysis. The College of Engineering Library also is housed in Gavett Hall, which is named in honor of the late Joseph W. Gavett, Jr., Chairman of the Department of Engineering and Professor of Mechanical Engineering from 1921 until his death in 1942.

**Harkness Hall**, the naval and air science building, named for the late Rear Admiral William Harkness of the Class of 1858, noted naval astronomer. It contains classrooms, an armory, a practice range, naval reference library and other facilities for the instruction of the Naval Reserve and Air Force Officers' Training Corps units.

**Taylor Hall**, adjacent to the engineering building, the headquarters of University School of Liberal and Applied Studies, containing administrative offices, classrooms, and laboratories. It is named for the late Earl B. Taylor, Professor of Education and first Dean of University School.

**The Henry Alvah Strong Auditorium**, a memorial gift of Mrs. Henry Alvah Strong and her son, L. Corrin Strong. It contains a large hall used for many College functions, and an organ given in 1937 by Mrs. Strong. On a lower floor is a lecture room accommodating 500 persons. These two halls are used for assemblies, lectures, College Chapel, stage productions, concerts and other events.

**The Administration Building**, facing on River Boulevard at the corner of Library Road, houses the central University administrative offices, and the offices of the University registrar and bursar.

On the lower campus to the west and north of Eastman Quadrangle are the following buildings:

**Crosby, Burton, Lovejoy, Hoeing, Tiernan and Gilbert Halls**, form a pleasant men's residence area, adjacent to Fraternity Quadrangle, and provide residence accommodations for approximately 1050 students. Burton and Crosby Halls were built in 1930, and are named respectively for George Nelson Crosby, of Rochester, and Henry F. Burton, Professor of Latin from 1877 to 1918. Lovejoy and Hoeing Halls were first occupied in the fall of 1953 and Gilbert Hall was completed in the fall of 1959. Special facilities include lounges, typing rooms, game rooms, laundries with automatic washing machines for student use, and luggage storage. Lovejoy Hall is named for the late Frank W. Lovejoy, a devoted Trustee of the University. Hoeing Hall is named for the late Charles Hoeing, Dean of the College for Men from 1914 to 1929. Tiernan Hall honors Martin F. Tiernan, an alumnus of the University in the Class of 1906, a Trustee since

1928 and a generous benefactor of the University. Gilbert Hall was recently dedicated to the memory of the late Donald Wood Gilbert, professor of Economics, provost and Vice President of the University.

**Todd Union**, facing the men's residential area, a student center housing offices and meeting rooms for such extra-curricular coeducational groups as religious organizations, the campus newspaper, WRUR radio studio, glee clubs, student government, and others. It also contains a snack bar. It is named for the late George W. Todd of Rochester.

**Alumni Gymnasium** for men, housing under one roof facilities for the Department of Physical Education, including the main gymnasium, a natatorium seating 500 and a seventy-five by thirty foot swimming pool, a basketball palestra seating 2,200, a large field house, handball and squash courts, and wrestling rooms.

**Fauver Stadium**, close to the Alumni Gymnasium, a permanent grandstand at the main athletic field. It seats 6,000 spectators and provides accommodations for contestants in football and other intercollegiate sports. The stadium is named for the late Dr. Edwin Fauver, for many years head of the Department of Physical Education and College Physician. The Sculpture Studio and the offices of the Department of Foreign Languages are located in the building.

**Fraternity Houses**, built around a large quadrangle by eight national fraternities under a restricted agreement with the University. They are Alpha Delta Phi, Delta Kappa Epsilon, Delta Upsilon, Kappa Nu, Psi Upsilon, Sigma Chi, Theta Chi, and Theta Delta Chi. These houses provide additional residence accommodations.



**Men's Dining Hall**, in close proximity to the residential buildings. To the right of the entrance is a spacious students' lounge opening off a central lobby, and on the left is the faculty lounge with a main faculty dining room and two smaller ones. The lobby opens into a hall from both sides of which staircases go up to the second floor. The front portion of the second floor is the student dining hall. There are also four smaller dining rooms of varying sizes for student groups. Located in the building are offices of the School of Business Administration.

At the northeast corner of the River Campus, on the crest of a hill, are the:

**Women's Residence Halls**, consisting of residential facilities for 630 women. Connected with them is a gymnasium with a swimming pool. The residence is divided into four wings, each of which is a separate unit with its own living rooms, dining hall and house director. This arrangement provides an intimate and homelike atmosphere. The four dining halls are so planned that they may be opened into one large area for dances or all-college suppers. A music room and a library are included in each of the units, and each living room opens on a terrace. A large game room for coeducational use, with snack bar, floor lounges, and a clinic and infirmary are other facilities.

The four wings of the Residence Halls are named in honor of Susan B. Anthony, Mary T. L. Gannett, Emily Weed Hollister, and Lewis Henry Morgan, pioneers in women's education at the University. The dining hall is named for Mrs. Henry Danforth of Rochester, a devoted friend of the College for Women.

A tunnel joins the Residence Halls with the gymnasium so that the students may dress for physical education classes in their rooms, making the recreational facilities of the gymnasium easily available.

These women's facilities were planned with infinite care. The result is a center with excellent living, study, and social facilities and opportunities for the finest kind of training for the young women students on the River Campus.

**The Memorial Art Gallery** shares the Prince Street Campus with the Eastman School of Music. It is the center of creative art activities for the students of the University, as well as for the community and area. Its increasingly important permanent collections cover a wide range of period and art personalities from predynastic Egypt to contemporary times and include paintings, sculpture, tapestries, furniture and related decorative arts. These serve as invaluable teaching aids to the University's Fine Arts Department. Outstanding among its treasures are paintings by El Greco, Rubens, Matisse, Picasso, Strozzi, Delacroix, Courbet, Gilbert Stuart, Winslow Homer, Monet, Degas, Renoir, and others. A program of special monthly loan exhibitions from October through June gives students and public a continuously changing and provocative picture of contemporary and historic art. Paintings from the Gallery's collections are on view in various parts of the University and colorful framed prints are rented each term to students of the University's various schools for use in their dormitory rooms. The Gallery's Creative Workshop has an enrollment of over one thousand students in painting, sculpture, ceramics, weaving and enameling classes.





*Historical  
Sketch*



WHEN The University of Rochester celebrated its Centennial in 1950, a distinguished member of its faculty aptly described it thus: "The University has at last become what it was always meant to be: a fountain of knowledge, a power plant of energy, a treasury of culture." Its history, he said, is one of "creative change."

It is only three decades since the small liberal arts college that Rochester had been for seventy-five years was transformed into a true university through the establishment of the two professional schools, the Eastman School of Music in 1922, and the School of Medicine and Dentistry in 1925. These developments were followed by the reorganization of the Division of Graduate Studies as the Graduate School in 1942 and the University's admission to the Association of American Universities.

It was decided in 1957 to decentralize most of the administrative control of graduate work, and each of the colleges or schools of the University now administers its graduate programs. In 1944 the former Division of University Extension became University School of Liberal and Applied Studies.

Now in its second century, The University of Rochester is entering its greatest period of educational development to meet the tasks and challenges of today's complex world, and is internationally known as a center of teaching and research. Before all this came about, however, it went through a long period of early struggle and slow but sound growth.

*College of Arts and Science* For its first ten years, the University was located in the old United States Hotel near the Erie Canal, still standing in Main Street West. There, on November 5, 1850, seven professors and seventy students began classes. The furnishings consisted of "five pine tables, six arm chairs, one hundred common chairs, thirty settees for the chapel, seven box stoves, and seven boxes for wood." Some professors brought their own books as a nucleus for the library, and soon classical texts and histories were being ordered from New York and Europe.

Although it was founded chiefly by Baptists, it was not even from the beginning exclusively denominational. Some of its first Trustees and professors were members of other churches, and it always has been open to students of all faiths. All Baptist connection was severed in 1908, having survived chiefly on paper.

Ira Harris, a founder of the University, was its chancellor for the first three years, and Martin Brewer Anderson became the first President in 1853, serving until his retirement thirty-five years later. The young College had several scholarly teachers of learning and experience. There was also, as one historian has noted, "a remarkably enlightened plan of instruction, drawn up and printed by a special committee long before the doors were opened; a plan so forward-looking that many years elapsed before some of its bold innovations were realized."

In 1861, when its charter became permanent, the University moved to its own twenty-four acre campus on what is now Prince Street, which comprised the entire University campus until the 1920's.

From 1861 until 1900 the story of Rochester is one of "slow, honest, old-fashioned college education." David Jayne Hill succeeded Martin B. Anderson as President in 1890. He resigned in 1896 and later became United States Ambassador to Germany.

A new era began in 1900 when Rush Rhees was elected President. Until then the University had been a liberal arts college for men only. Interest in the education of young women had developed, however, as early as 1881 when Lewis H. Morgan, the noted anthropologist, bequeathed the University a substantial sum to provide "female education of high grade in the City of Rochester." Thirty-one years passed before this bequest became available. A movement among representative women of Rochester, led by Miss Susan B. Anthony, the great women's rights advocate, resulted in the admission of women students in 1900. The proceeds of the Morgan bequest having become available, and additional land having been provided, two buildings were erected for the exclusive use of women.

A period of cautious expansion began under President Rhees. Generous gifts made in 1924 by George Eastman, the General Education Board, alumni and alumnae, citizens of Rochester, and many others made possible a new campus in 1930 on the Genesee River for the College for Men, and the College for Women took full possession of the historic Prince Street Campus.

With the retirement of President Rhees in 1935, Alan Valentine was inaugurated as Rochester's fourth President. During the fifteen years of his administration, the University grew rapidly in national and international prestige as its programs in the arts and sciences, music, and medicine attained impressive quality and strength. One of the earliest developments during this period was a revision of the College curriculum. Of special importance was the institution of the Honors Division which gives special opportunities to qualified students to work independently and to receive a large amount of individual instruction.

College departments in general were strengthened, particularly those of psychology, chemistry, and physics. The Department of Physics and Astronomy became one of the most outstanding in the country, and is a center of teaching and research in the fields of nuclear physics and cosmic ray studies. A 240,000,000-volt cyclotron and laboratory were built shortly after the war, and at that time the cyclotron was the largest post-war atom smasher in the country.

Another important event in the period from 1935 to 1950 was the establishment of the Institute of Optics, the foremost institution of its kind in the United States, which offers training in geometrical, physical and physiological optics leading to the Bachelor of Science and advanced degrees.

Other new facilities built at the College of Arts and Science in the post-war period were a large addition to Gavett Hall, the engineering building; Harkness Hall, which houses the Naval and Air Science Departments; additional men's residence halls, and a chemistry research wing on Lattimore Hall.

Dr. Cornelis W. de Kiewiet was inaugurated in June, 1951, as the University's fifth President. A distinguished historian and educational administrator with an international viewpoint, he formerly served on the faculty and administration of Cornell University, where he was appointed Professor of Modern European History in 1941. He subsequently served as Dean of Cornell's College of Arts and Sciences, Provost of the University and Acting President.

Under President de Kiewiet's leadership there has been a sharpening of educational purpose at Rochester based on the conviction that "we must concentrate on the coordination and efficiency of all those activities which constitute each student's total educational experience."

One of the first steps to accomplish this purpose was taken in 1952 when the Board of Trustees authorized the merger of the College for Men and the College



*The United States Hotel was the home of  
The University of Rochester from 1840 to 1850.*

for Women, which for a quarter of a century occupied separate campuses on opposite sides of the city, as a single coeducational College of Arts and Science. This was followed by a major building program to provide necessary facilities for the combined College, such as the Women's Residence Halls and Gymnasium, a large Men's Dining Hall and Faculty Club, and the remodeling of Todd Union as a coeducational student activities headquarters. The merger of the undergraduate College took place with the opening of the 1955-56 academic year.

Significant new educational and student services programs also have been introduced. The College administration was reorganized to give full effect to the University's philosophy of dealing with the student as a whole human being whose successful college experience is the product not only of satisfactory work in the classroom and laboratory but of his total intellectual, social and spiritual interests as an undergraduate.

Of wide educational significance is the integration into the undergraduate curriculum of a "world awareness" program reflecting the greatly changed nature of the modern world and the revolutionary effects of these changes upon the total life of the American people. It embraces the study of large areas of the world and vast multitudes of its people which in the past have been largely neglected in undergraduate teaching in the colleges of this country, but which have emerged as crucial factors in world relations. The project is being carried out on a broad front which includes:

A pioneering undertaking in Non-Western Civilizations, leading to a field of concentration, and designed to give the students a comprehensive understanding of the history, philosophy, economics, culture and political concerns of the Middle East, Asia, Africa and Latin America, so that they can deal intelligently with the acute problems that involve our nation in these key areas.

A Canadian Studies Program, supported by a grant from the Rockefeller Foundation, to provide in the College of Arts and Science an opportunity for students on the undergraduate level, through formal courses and in other ways, to become better informed about every aspect of Canada and its development, and to promote wider understanding of the international relations

problems between that country and the United States. Related to the Canadian Studies Program, is a concentration in American Studies, and together they provide an interdisciplinary approach to the development of North American civilization.

A Center for the Study of Group Relations, which began functioning officially in the fall of 1955. Courses in the area of ethnic and minority group relations are offered, as well as a series of institutes on minority groups in the United States, to be held annually, with outstanding national authorities as lecturers and discussion leaders. The purpose of the Center is to foster more harmonious relations between ethnic and racial, religious and social groups through education, research and community service.

## *Professional Studies*

For many years the University has conducted successful undergraduate and graduate programs in Business Administration, Education, and Engineering. Their strong development and increasingly important stature led in 1958 to the decision to give these former divisions autonomous professional status as the School of Business Administration, the College of Education, and the College of Engineering. Each has its own Dean or Director and awards its own degrees.

All full-time students preparing for entrance to these professional units enroll in the College of Arts and Science for their first two years of undergraduate work.

### *School of Business Administration*

For nearly twenty years the University has conducted a well-balanced group of professional and liberal arts studies in Business Administration. The growth of this program resulted in the creation of the School of Business Administration to provide more effective and extended professional education in this field. Increasing enrollment of full-time and part-time students in undergraduate and graduate programs, greater demand for community-directed activities, and the developing opportunities and need for research contributed importantly to the decision to establish the School. It offers a four-year course leading to the degree Bachelor of Science with a major in Business Administration, in Accounting, or in Industrial Management, and graduate work for the Master of Science degree with a major in Business Administration.

### *College of Education*

The University has provided courses in teacher education for many decades, first through extension classes, and later through the Department of Education of the College of Arts and Science and in University School evening classes. In 1956 a Division of Education was formed, responsible for all teacher education at both the undergraduate and graduate level on the River Campus. The next major step in its development was the establishment in 1958 of the College of Education, which includes the Division of Nursing Education. The College offers the degrees Bachelor of Science with specialization in elementary or in secondary school teaching, Bachelor of Science

with a major in General Nursing, and Master of Education, Master of Arts in Education, Master of Science in Nursing Education, and the Doctor of Education.

**College of Engineering** Courses in Engineering have been given at The University of Rochester for nearly half a century in recent times under the Division of Engineering of the College of Arts and Science. The new separate College of Engineering is exclusively an upper division and graduate level college, although it continues to teach as service courses freshman and sophomore engineering subjects. The College offers work through the master's level in Mechanical Engineering, and through the Ph.D. level in Chemical and Electrical Engineering.

**Institute of Optics** The Institute is the only university optical teaching and research department in the United States offering complete training in geometrical, physical, and physiological optics. A staff of twenty professors and research associates is engaged in instruction, research and development of all branches of optical science. The Institute was established in 1938 to help meet the need for adequately trained men and women not only in the optical industry but in many branches of science and industry which depend for their data upon optical instrumentation and optical data. It offers courses leading to the Bachelor of Science degree with a Major in Optics, the Master of Science and the Doctor of Philosophy.

### *Other Divisions of the University*

**Eastman School of Music** In 1918 George Eastman presented to the University the property and corporate rights of the Institute of Musical Art, an independent teaching institution of high standard founded five years earlier. Later Mr. Eastman purchased a site for new buildings, erected a modern and complete music school, and provided generous funds for its endowment. Students in the College of Arts and Science may take courses at the Eastman School for credit towards the arts degree, or may register for individual music instruction. Located in downtown Gibbs Street, the School's buildings provide offices, studios, classrooms, the Eastman Theatre, and a small auditorium seating 500 persons for recitals, chamber music concerts and operatic performances. Three large buildings adjacent to the Eastman Theatre and School of Music provide shops for construction of scenery, practice rooms, classrooms, gymnasium, and the Sibley Music Library.

In the fall of 1955 the Eastman School acquired a portion of what had been the campus of the College for Women, with buildings that provide Eastman School students with excellent residence and social facilities.

**University Medical Center** Opened in 1925, the School of Medicine and Dentistry was the result of a proposal made by the General Education Board to establish a school of the highest order as the first wholly new medical school built under a nationwide program to reorganize medical education. Funds for buildings, equipment, and endowment were

furnished by the General Education Board and George Eastman. The Medical Center includes:

*Strong Memorial Hospital*, which serves as the teaching hospital in connection with the School of Medicine and Dentistry, and its associated clinics. A gift from Mrs. Gertrude Strong Achilles and Mrs. Helen Strong Carter in tribute to their parents, Henry Alvah and Helen Griffin Strong, provided for the erection of the hospital. Arrangement was made with the City of Rochester for the erection of its Municipal Hospital in close connection with Strong Memorial Hospital. These function as a single institution and unite under one administrative control a total capacity of about 700 beds. The two hospitals give the Medical School unusual advantages for clinical teaching.

*Psychiatric Clinic*, opened in 1948, made possible by a gift from Mrs. Helen W. Rivas of LeRoy, New York. The clinic, known as Wing R, concerns itself primarily with the study and care of patients whose illnesses promise improvement under modern therapy.

*Atomic Energy Project*, where research and teaching are conducted on medical problems related to atomic energy production, under contract with the Atomic Energy Commission.

*Department of Nursing*, in the School of Medicine and Dentistry, conducts a program leading to the degree Bachelor of Science with a major in Nursing, given by the School of Medicine and Dentistry. The School has unusual facilities for scientific and clinical instruction.

#### **Graduate Studies**

The first graduate degree in course, Master of Arts, was voted by the Board of Trustees of the University in 1851. Graduate work developed slowly from that time forward, and in 1924 a standing University Committee on the Ph.D. Degree was created. With the establishment of the Schools of Medicine and Music, the expansion of University library facilities, and the provision of equipment and fellowships for research in the College of Arts and Science, graduate work developed rapidly and in 1928 a Dean of Graduate Studies and the standing Committee on Graduate Studies were appointed. The constant increase in graduate and research students led in 1937 to the creation of a formal Division of Graduate Studies, headed by its Dean. In 1942 the Division was reorganized as the Graduate School.

Beginning in 1957 it seemed advisable to decentralize much of the work leading to advanced degrees and each college or school in the University is responsible for recommending candidates for Master's degrees. The work for the degree Doctor of Philosophy is under the general control of the University Council on Graduate Studies which recommends to the Board of Trustees the candidates for this degree. Each school of the University has an Associate Dean charged with the responsibility of administering the work for Graduate Studies.

#### **University School of Liberal and Applied Studies**

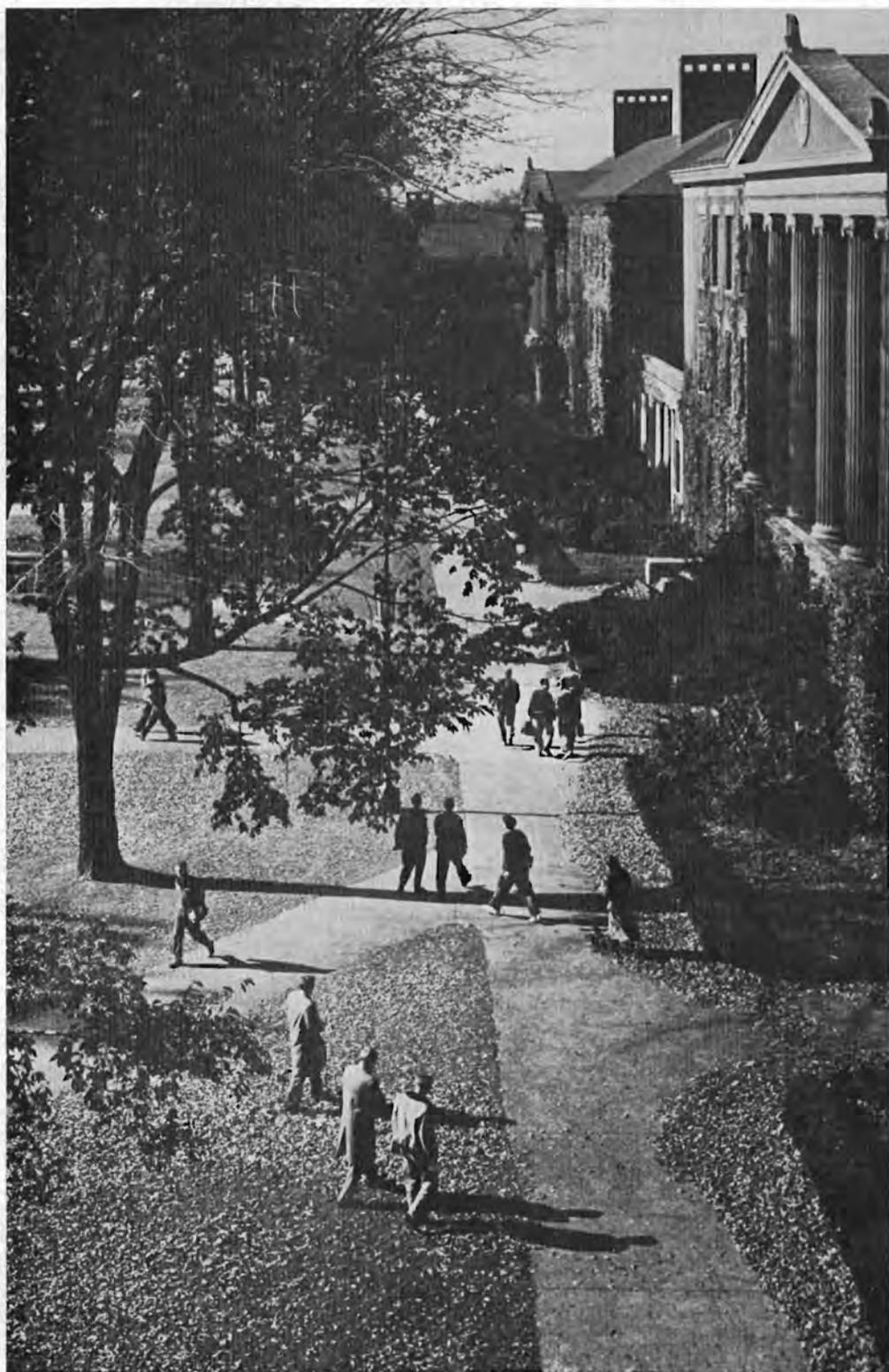
University School is organized to provide university training to persons who, because of employment or for other reasons, are unable to attend one of the other schools of the University, or whose personal or professional needs are not met by the programs of such schools. Most classes are held in the late afternoon, during the evening, or on Saturdays. Courses not generally given in the College of Arts and Science are available in University School to students of the College.



## *Evening and Summer Sessions*

**Evening Session** Five schools and colleges participate in the Evening Session on the River Campus: The College of Arts and Science, the College of Education, the College of Engineering, the School of Business Administration, and University School of Liberal and Applied Studies. Offerings are designed primarily for part-time students. The Colleges of Arts and Science and Engineering give evening session programs at the graduate level leading to the master's degree. The College of Education and the School of Business Administration offer evening session instruction to both undergraduate and graduate students. Part-time students planning to earn bachelor's degrees in one of the professional colleges are registered in University School until they meet the admission requirements of the school or college of their choice. University School provides courses leading to the degree Bachelor of Science in general studies, and to the master's degree in industrial statistics and applied mathematics.

**Summer Sessions** In 1921 the University instituted instruction through summer study. There are two Summer Sessions—one on the River Campus and the other at the Eastman School of Music. Undergraduates in The University of Rochester and from other colleges and universities may take advantage of summer instruction and transfer the credits earned to their own institutions. Undergraduates in the River Campus Colleges may complete requirements for a degree in less than four years by attending the Summer Session. Courses of interest to teachers, nurses and others who desire to do regular college work during the summer period are included in the River Campus summer study offerings. A bulletin containing the announcements for the next session will be available in April, 1960. Inquiries regarding this session should be addressed to the Director of the Summer Session, Taylor Hall, River Campus Station, Rochester 20, New York. Information concerning the Summer Session of the Eastman School of Music may be obtained from the Registrar, Eastman School of Music, Rochester 4, New York.



# Admissions

## General Statement

ADMISSION is selective. In this selective process the Committee on Admission has two principal objectives. It seeks first to admit only those students who have the qualifications for a successful college experience. In that evaluation the Committee is concerned with the character, motivation, and interests of the candidate as well as the candidate's academic preparation and aptitude. Secondly, the Committee must limit the size of the class to a number consistent with the best teaching and the most efficient use of the River Campus facilities.

In considering applications for admission, the Committee places particular emphasis upon the following:

1. The secondary school record.
2. The results of the College Entrance Examination Board Scholastic Aptitude Test.
3. The recommendation of the principal or headmaster.
4. The candidate's character, health, and personal qualifications.

**Application Procedure** All applicants are required to make application on forms which are provided on request. These forms must be accompanied by an application fee of \$10.00 which is non-refundable.

Applicants for admission are encouraged to submit their applications between October 1 and February 15 of the final year in secondary school. Applicants are also required to take the College Entrance Examination Board Scholastic Aptitude Test. It is to the advantage of the applicant to take either the December, January or February test (see section on Scholastic Aptitude Test on page 31). This may make it possible for the Committee on Admission to take earlier action on applications than would otherwise be possible and to grant provisional admission to better qualified applicants, subject to the successful completion of their secondary school program. Applications completed before March 1 will receive best consideration. Applications completed after that date will receive consideration as vacancies permit.

Applicants for the degree, Bachelor of Arts with concentration in music, should request application forms from the Director of Admissions. The forms for this program will include a supplementary resumé of musical training as well

as reports by music teachers. All parts of the application (except music teacher report forms) should be returned to the Director of Admissions. Decisions on applications for admission to this program will be made after the musical qualifications of the candidate have been evaluated by the Eastman School of Music Admissions Committee. These applicants pay the regular \$10.00 application fee.

**Personal Interview** Applicants are encouraged to arrange a personal interview with a member of the Committee on Admission whenever possible. Such an informal conference is usually very helpful in making college plans. It also affords the applicants an opportunity to gain a first-hand impression of the colleges. There is no adequate substitute for this in determining a college choice. Applicants are urged to arrange appointments during the summer and fall months, whenever possible, and to avoid March and April when applications are being processed.

The Admission Office is open for appointments on week days from 9 A.M. to 5 P.M. and on Saturdays from 9 A.M. to Noon. The office is closed on Saturdays from the middle of June to the middle of September.

Applicants are urged to make an appointment for an interview by letter or telephone. This will avoid delays and assure the presence of a member of the Committee on Admission.

**Recommended Subject Preparation** *The Committee on Admission places emphasis upon the quality of the applicant's secondary school record rather than upon any prescribed pattern of courses and credits.* In determining the adequacy of a student's academic preparation for admission, the Committee on Admission will be influenced by several factors. These factors include the distribution and balance in the secondary school program, the quality of the achievement in that program, and its suitability in content for the course of study which the student proposes to follow.

The subjects listed below are recommended as a safe guide for students in planning their high school programs for admission to the various courses offered by the University *but do not constitute an inflexible list of admission requirements:*

*For the Bachelor of Arts degree:* Concentration in English, history, government, economics, psychology, foreign language, mathematics, and other fields listed on page 83. (Pre-medical, pre-dental, and pre-law students normally fall within this category.)

	UNITS
English.....	4
Foreign language.....	2 or 3
College Preparatory Mathematics (to include the study of algebra and plane geometry).....	2½ or 3*
Chemistry, Physics, or Biology.....	1
Social Studies.....	1
Electives.....	5½ or 4
<b>Total.....</b>	<b>16</b>

\*Although trigonometry is not required, it will be helpful to students who will include mathematics in their college programs.

*For the Bachelor of Science degree programs:* Astrophysics, biology, business administration, engineering, industrial management, chemistry, geology, physics,

optics, education, or nursing. These Programs of Study are listed under individual course listings; see page 103 for an index to the courses.

	UNITS
English.....	4
College Preparatory Mathematics (to include the study of algebra, geometry and trigonometry).....	3 or 4**
Social Studies.....	1
**Chemistry or Physics.....	1
Electives.....	7 or 6½
Total.....	16

\*\*Applicants for business administration, industrial management, education, biology, geology, chemistry or nursing should follow the Bachelor of Arts mathematics recommendation.

\*\*\*Chemistry required as preparation for chemistry, chemical engineering, and biology. Physics required for physics, astrophysics and electrical engineering. Preparation in both chemistry and physics is desirable for these fields.

Students who transfer from one program of study to another after admission may be required to make up any deficiencies in their preparation for the program to which transfer is made.

In general, preferred subjects to be offered as electives for either the Arts or the Science degree programs include additional units in language, mathematics, history and science. Other appropriate elective units may be accepted.

Candidates for the degree Bachelor of Science in Education will be better prepared for college by following the guide for candidates for the degree Bachelor of Arts rather than that for the Bachelor of Science.

**Scholastic  
Aptitude  
Test**

All applicants for admission as freshmen are expected to take the Scholastic Aptitude Test offered several times a year by the College Entrance Examination Board. The dates on which the test will be given are shown below:

Saturday, December 3, 1960  
 Saturday, January 14, 1961  
 Saturday, February 4, 1961

Saturday, March 18, 1961  
 Saturday, May 20, 1961  
 Wednesday, August 9, 1961

Applicants for admission should take this test in December, January or February of their senior year in secondary school. Application to take the test should be made to the College Entrance Examination Board at least three weeks before the scheduled date. A Bulletin of Information, sent to all candidates registered for the test, will acquaint applicants with the character of the questions asked.

Application forms for the test may be secured from the College Entrance Examination Board, Post Office Box 592, Princeton, New Jersey, or the Pacific Coast Office of the Board, Post Office Box 9896, Los Feliz Station, Los Angeles 27, California. The fee is \$6.00 and is payable to the Board. The test will be given at numerous centers specified in the Bulletin of Information published by the Board.

**Notification  
of Action on  
Applications  
for Admission**

All applicants are notified as promptly as possible of action taken on their applications. Included with all application forms for admission is a sheet of instructions outlining the steps to be taken in completing the application for admission. Action on an application will be withheld until the applicant fulfills the requirements outlined in the instructions.

**Admission Deposit** Students receiving notification of admission prior to May 1 are required to post an Admission Deposit of \$50.00 by the middle of May (the exact date will be stated in the letter of admission). Any students admitted after May 1 will be required to make the deposit promptly upon receipt of the letter of admission. This procedure has been established to provide ample time for students admitted at any early date to reach a decision on college choice. *The deposit is not refundable. It is not an additional fee.* It will be credited to the first term bill, and in the case of dormitory residents, part of it will be used to cover the dormitory deposit and breakage fee referred to elsewhere in this bulletin.

**Early Decision Program** Exceptionally well-qualified applicants for admission who have reached a firm decision that Rochester is the college of their choice may apply for early decision upon their application for admission.

To be eligible for such early action the applicant must:

1. Complete formal applications for admission prior to November 15 including College Entrance Examination Board Scholastic Aptitude Test scores taken in the junior year.
2. Present certification by the secondary school that application is being made only to the University of Rochester.

Applicants admitted under this program will be notified not later than December 15 and will be expected to pay the regular deposit within two weeks of notification of acceptance.

Not more than 25% of the class will be accepted under this program. Those not accepted will be notified and their applications considered under the regular admission procedure later in the year.

Since it is not always possible to take early action on scholarship applications, this Early Decision Program is best suited to those students not in urgent need of financial assistance.

**Admission to Advanced Standing** In general, candidates for admission to advanced standing must meet the entrance requirements and present satisfactory evidence that their previous academic work has been of distinctly high quality. Their credentials must include a statement of honorable dismissal. Credit for work done at other institutions will be given only after the student has been at The University of Rochester long enough to demonstrate that he can meet its standards and will include only those subjects which can reasonably be accepted as the equivalent of work in the course he is pursuing.

All persons admitted must, in order to qualify for graduation, complete not less than one year (thirty semester hours) of work in a College or School of the University.

Action on applications for admission to advanced standing will ordinarily not be taken before May 1.

It is probable that in 1961 no applications for admission to advanced standing can be accepted from women students whose homes are outside commuting distance of Rochester. (This limitation does not apply to applicants for the B.S. degree in Nursing who have completed their two years of requirements in liberal arts)

Students with two or more full years of college work elsewhere, who seek admission to the College of Engineering, School of Business Administration, and the College of Education, should read carefully the material on admission in the section of this bulletin devoted to that school or college.

## *Special Students*

Students desiring to pursue a special course leading to no degree are admitted only for extraordinary reasons. Ordinarily special students are limited to persons holding a degree from a recognized college. All students so admitted must present the usual sixteen units of preparatory work. Special students are subject to all general regulations and pay a tuition fee amounting to \$43.00 per semester hour and all incidental fees, attached to any course they take.

## *Introductory Work For Students Admitted To Advanced Standing*

Students admitted to advanced standing are required to report for an abbreviated orientation program during Freshman Week. These students take tests, are given physical examinations, make a tour of the library, and have their photographs taken. While the program is somewhat less extensive than that prescribed for freshmen, its aim is similar—namely, to assist the advanced students in adapting themselves to a new college environment.

## *Freshman Week*

Freshmen are required to report one week before regular instruction begins. During these days, talks are given by the President, the Deans, the Director of Religious Activities, the Directors of Residence, and others. The nature and aims of college study, the routine procedures of the University, the meaning of a liberal education, and the problem of adjustment to college work are discussed. All entering students take a series of tests to be used by the Faculty Advisers and counselors in counseling students during their college course. This program is supplemented by a series of luncheon and dinner meetings, conducted by undergraduate leaders and attended by members of the faculty and administration, by a tour of the library, and, for women two days in the Bristol Hills at a camp sponsored by junior women. A fee of approximately \$25.00 is charged for Freshmen Week meals and activities.

The objectives of Freshmen Week are to assist the incoming students in adapting themselves to college life and work, and to obtain such information regarding the abilities and aptitudes of each student as may help the faculty and advisers in the later guidance of the student's work.



## *Tuition and Fees*

### *Tuition and Laboratory Fees*

**T**UITION is \$1275 a year including laboratory fees. The present maximum and minimum tuition charge for the normal program leading to the Bachelor's degree is \$5100. This amount is intended to cover the number of hours of credit specified in the catalogue for the degree for which the student is a candidate. If the total number of hours taken for the Bachelor's degree exceeds by a considerable amount the number specified for the course which the student is taking, an extra charge may be made at the rate of \$43.00 per credit hour. The annual tuition charge of \$1275 does not include the special fees listed below. All fees are payable at the beginning of each term and must be paid on or before the final date for payment given in the calendar. If a student has not completed financial arrangements by this date his registration for the term will be cancelled. Bills are not sent by mail; each student is required to obtain his own bill from the Accounting Office. A special fee of \$10.00 plus service charge and interest will be added for late payment. Students who fail to register their courses by the prescribed date each year as indicated on the calendar will be charged a special fee of \$5.00.

The University has made arrangements with outside sources for a program which provides for monthly payment of tuition, room, and board. Details may be secured through the Accounting Office.

**Fees for  
Extra Courses**

If the number of courses a student takes for credit in any term exceeds the number specified in his course of study, he may be required to pay an extra fee for such courses at the rate of \$43.00 per credit hour. There will be no extra charge, however, when the student is merely an auditor. Any student may audit any course provided only that he has the consent of the instructor. An extra charge may also be made when a student is permitted to take a course in another school of the University over and above his normal program. In such a case, the course will be regarded as the extra course, and full tuition will be charged. Apart from these exceptions, each student's regular program as approved from year to year by his Faculty Adviser shall be covered by the normal tuition of \$637.50 a term.

**Application Fee**

An application fee of \$10.00 must accompany all applications for admission. This fee is not returnable.

**Health Service Fee**

A health service fee of \$25.00 is paid by all students. A description of the services covered is given on page 56.

**Student Activity Fees**

An activity fee is paid by all students. This fee varies slightly from year to year in accordance with the budget prepared by the Finance Board of the College Cabinet. For the year 1960-61 the fee is \$25.00.

An athletic fee of \$25.00 is also paid by all students. This includes admissions to all athletic events.

A fee of \$5.00 is paid by non-resident students for the maintenance of the special facilities provided in the Residence Halls for their use.

Women students and freshmen male students pay an additional fee of \$5.00 for support of the social program of the residence halls.

**Other Fees**

There are no extra laboratory fees. These fees are included in the tuition of \$1275.

A *transcript fee* of \$1.00 per copy is charged for certified copies of a student's record, except for the first copy which is furnished free.

A special fee of \$5.00 shall be assessed against all students missing a term examination through carelessness, the Dean of Students to decide the cases.

Laboratory breakage deposits are charged in all chemistry and some biology courses. Unused balances are refunded.

Resident students rent mail boxes from the River Campus Station Post Office at the annual rate of \$1.80.

A special fee of \$50.00 is charged to students who retain their status as Rochester undergraduates while they participate in a junior-year-abroad program.

**Fees for Students Enrolled  
for Courses in the  
Eastman School of Music**

(1) Students who are concentrating in music shall be charged only the regular tuition fee of the College of Arts and Science. The tuition covers the courses in music required for concentration as outlined on page 169. The cost of any additional music subjects shall be paid by the student.

(2) Other students may elect courses at the Eastman School of Music without payment of an additional fee except as follows: (a) if the program of the student involves courses in excess of the normal thirty-hour program, the elective at the

Eastman School of Music will be regarded as the extra course and full tuition for the course will be charged at the normal rates of the Eastman School of Music; (b) if the elective is in Applied Music, an extra fee may be charged if, upon request, the student is assigned to certain teachers for instruction, but this fee will be less than the usual charge for such instruction. All students in Applied Music are charged a practice room fee. The fee varies depending upon the student's program of study.

## Estimated Student Expenses

Because of possible severe fluctuations in cost of living and the instability of prices, tuition, fees and estimates for total expenses are subject to change. In the figures used below, estimates for such items as room and board are based upon the cost prevailing at the time of publication of this bulletin. Under any circumstances, the cost of a year at college is variable, depending largely upon the willingness and need of the student to curtail those expenditures which are not essential to education and reasonable comfort.

Expenses differ only slightly for men and women. The table below gives those items of expense which are fixed or only slightly variable:

<i>Items</i>	
Tuition.....	\$ 1275
Student activity and athletic fee.....	50
Health service fee.....	25
Books and supplies.....	30-50 <sup>1</sup>
Residence hall room (including linen service)	
Men.....	306-351
Women.....	310-350
Board.....	500
<b>Totals.....</b>	<b>\$2180-\$2250</b>

Expenditures for personal necessities, organization dues, recreation, and travel vary from one individual to another. Students who watch their expenditures closely report amounts ranging from \$250 to \$400 a year for these items. The *minimum* annual cost including board and room in the usual type of college residence hall may, therefore, be estimated at \$2450. The *average* annual expenditure is approximately \$2600.

Full information regarding residence hall accommodations will be supplied by the Director of Residence Halls for Men or the Director of Residence Halls for Women.

Day students who live in their homes in the city report total expenditures of approximately \$1900. Such students, in planning their budgets, will naturally deduct the items of residence hall room and board from the figures given above, but they should include an average of \$100 for lunches and \$100 for transportation.

<sup>1</sup>Engineering students should add \$50.00 for slide rules, drawing instruments and supplies.





## *Scholarships and Loans*

**T**HE University has available for student aid the income from endowments given specifically for this purpose, certain annual contributions for the maintenance of special funds, and a large sum appropriated annually from the general income of the University. Although the total amount accruing from these sources is large in proportion to the enrollment, it is impossible to assist all deserving students who apply. An exceedingly careful selection of the recipients of financial aid is therefore necessary.

### *Basis for Scholarship Selections*

Special conditions are attached to some of the scholarships, such as nomination by persons outside the University, residence in a particular place, or specific qualifications of the holder. In most cases selections for award are based upon the relative merits of the candidates, including character, personality, maturity of purpose, and high scholastic aptitude and achievement. The amount of the stipend granted in each case is determined solely by the financial need of the recipient. All applicants for freshman scholarships are required to take the Scholastic Aptitude Test offered by the College Entrance Examination Board. (See Page 31)

### *Procedure for Making Application*

Applicants for scholarships should file no later than March 1 a complete application for admission. They are also required to submit financial statements to the College Scholarship Service, Princeton, N. J., in which The University of Rochester

is one of the participating colleges. Detailed information and forms for this purpose will be provided by the Admission Office. A single scholarship application will make it possible to consider the applicant for any scholarship for which he is eligible and which meets his requirements.

Applications for scholarship aid from students already in college must be submitted on dates specified by the Committee on Student Aid.

**Renewals of Scholarships** Holders of Rochester National, Centennial Prize, Rochester Prize, Bausch & Lomb, Genesee, Alumni Memorial, Casey-Long, Rochester City, and other prize scholarships as well as some other scholarships granted on nomination of persons outside the University are not required to apply annually for the renewal of their scholarships. These scholarships, as stated in the letter of award, are normally continued from year to year provided the record, conduct, and financial circumstances of the holders justify such continuation. Annual financial statements are required.

All other scholarships, however, are granted for an academic year. The holders of all scholarships, except those referred to above, must therefore make application at the times announced for such renewal application if they desire to have their scholarships renewed. The renewal of annual scholarships cannot be assured. The usual conditions under which annual scholarships may be renewed are that the holder continue to need financial assistance, that he have no failures recorded against him, and that his academic standing for the preceding year be above the average of undergraduate students on the River Campus. Renewal applications should be made on a form provided for the purpose and must be returned to the Office of Student Aid not later than May 10, or date to be posted.

**Scholarship Regulations as Applied to Students Receiving Other Forms of Aid**

Veterans eligible for educational benefits under federal or state legislation, members of the NROTC Unit receiving educational benefits under the "regular" plan, and recipients of scholarships granted outside the jurisdiction of the University may be eligible to hold certain of the prize scholarships, awarded primarily as a recognition of achievement rather than as a means of student aid. In such cases the amount of the stipend granted under such scholarships may be adjusted to the individual student's actual needs.

All students are eligible for loan fund help if they meet the established requirements.

**New York State Scholarships**

The University of Rochester is an approved university in which New York State Scholarships may be used.

**Additional Regulations**

Scholarships are granted only to students who are pursuing one of the regular courses for a degree.<sup>1</sup> If the holder of a scholarship receives a failing grade or has a grade average below the upper half of the students on the River Campus for the first term, he will ordinarily forfeit his scholarship for the second term. If he becomes subject to disciplinary action, he may forfeit his scholarship during the continuance of the discipline.

Statements of the conditions of award of the various types of scholarships begin on page 40.

<sup>1</sup>Holders of Baptist Education Society Scholarships may be freed from the operation of this regulation, on request of the Secretary of the Society.

## *Scholarships Open to either Men or Women*

THE ROCHESTER NATIONAL SCHOLARSHIPS of which there are approximately nine available in each entering class, six for men and three for women, have an adjustable stipend ranging from \$100 to \$2000 a year for four years. Criteria for award include character, motivation, stability, physical vigor and qualities of leadership as well as evidence of superior academic achievement and promise.

THE CENTENNIAL PRIZE SCHOLARSHIPS, of which there are several available in each class, have an adjustable stipend, ranging from \$100 to \$1800 a year for four years. These scholarships are granted upon the recommendation of principals and headmasters of secondary schools to students of exceptional intellectual promise, maturity of purpose, good character, good health, and personal qualities which should enable their possessor to work happily with his or her associates.

THE ROCHESTER PRIZE SCHOLARSHIPS, of which there are a number available in each class, have an adjustable stipend, ranging from \$100 to \$1800 a year for four years. These scholarships are awarded upon the same basis as the Centennial Prize Scholarships described above.

HONORARY PRIZE SCHOLARSHIPS may be awarded without stipend to a limited number of applicants who meet the qualifications for award and merit this distinction but who have no need for financial assistance.

THE GENESEE SCHOLARSHIPS, each yielding a maximum of \$1200 a year, are granted by the Trustees for the benefit of graduates of secondary schools located at a distance from the City of Rochester. Nominations for these scholarships are made by the principals and headmasters of secondary schools on the basis of high scholarship, character, personality, and need.

RUSH RHEES SCHOLARSHIPS were founded in memory of Rush Rhees, President of the University from 1900 to 1935. In making awards, consideration will be given to the candidate's financial need in addition to his personal qualifications, achievements, and aptitude for leadership. These scholarships are awarded for two years contingent upon satisfactory conduct and are renewable for the remaining two undergraduate years if the recipient's general performance and financial circumstances warrant.

THE ROCHESTER CITY SCHOLARSHIPS are granted by the Trustees to the City of Rochester for the benefit of graduates of the Rochester public high schools who for at least the two years directly preceding graduation have been in attendance at those schools. The scholarships are of two kinds, those awarded by competition and those awarded on nomination. In the first group, those awarded by competition, five scholarships with maximum annual stipends of \$1000 each are granted in each class to the three men and the two women who, fulfilling the conditions of eligibility stated above, obtain the highest averages for the first term of the freshman year among men and women respectively. For the second group, the scholarships awarded on nomination, nominations of eligible students are made by the principals of the Rochester public high schools on the basis of high scholarship, character, personality, and need; and awards are made by the Committee on Student Aid to the nominees regarded as most meritorious. The

number of these scholarships in each class and the stipend of each are determined by the Committee on Student Aid. The purpose of these scholarships is to provide a college education for graduates of the Rochester public high schools who would be unable to obtain such an education without financial aid, but whose circumstances are such that with aid they can meet the financial obligations of a college course.

**BAUSCH AND LOMB SCIENCE SCHOLARSHIPS**, of which there are several available to reach entering class, have adjustable stipends based upon the financial need of the recipient. The Science Scholarships are open for competition among students who win the Bausch and Lomb Honorary Science Award Medal presented each year in secondary schools of the United States and its possessions to the graduating students with the highest scholastic standing in scientific subjects.

**THE GEORGE ABBOTT SCHOLARSHIPS** are awarded through the George Abbott Foundation. Criteria for award include character, academic achievement, aptitude, industry and need for financial assistance. Stipend adjustable to the financial need of the student.

**THE SAMUEL M. HAVENS PRIZE SCHOLARSHIPS** are awarded to promising candidates for any of the colleges or schools of the University who are residents of the State of Illinois and who are in need of financial assistance. The stipends to be determined by the appropriate committee on awards.

**THE KATY B. HOFHEINZ FRESHMAN SCHOLARSHIP**, endowed in 1939 by a gift from Mrs. Rudolph Hofheinz, will be awarded upon entrance to that freshman man or woman, who, in the opinion of the Committee on Student Aid, combines most clearly high scholastic attainments and promise, character, and maturity of purpose, with financial need. This scholarship is tenable only during the freshman year.

**THE FRED S. AND ELLA F. MILES SCHOLARSHIP FUND**, the income from which is to be used by the University in assisting needy students, either boys or girls, from Rochester, New York, is awarded upon recommendation of the Superintendent of Schools of the City of Rochester.

**MILTON S. COMFORT SCHOLARSHIPS** were endowed by the late Frances B. Comfort. Stipends are determined in each individual case by the Committee on Student Aid.

**THE PFAUDLER SCHOLARSHIP** is contributed by the Pfaudler Company for the financial assistance of a promising entering student. The scholarship will be awarded alternately to a student in engineering and liberal arts and may be held for four years of undergraduate work contingent upon the maintenance of scholarship requirements and a need for financial assistance.

**THE KATHERINE UPTON WILSON SCHOLARSHIP FOR HALOID XEROX PEOPLE** is provided through gifts of members of the Wilson Family. Eligibility is restricted to sons and daughters of Haloid XeroX Inc. employees with three or more years of service. Criteria for award include personal qualifications, evidence of general promise for successful college work and financial need.

**THE JOSEPH R. WILSON SCHOLARSHIP FOR HALOID XEROX PEOPLE** is provided by gifts of executive of Haloid XeroX Inc. Eligibility is restricted to sons and daughters of Haloid XeroX Inc. employees with three or more years of service. Selections will be made by the Committee on Student Aid and will be based

upon the academic and personal qualifications of the candidate as well as financial need.

THE ELLA HAWKINS CARLSON SCHOLARSHIP FOR HALOID XEROX PEOPLE is provided in memory of Mrs. Carlson by her son. Eligibility and method of selection of recipients are the same as for the Katherine Upton Wilson and Joseph R. Wilson scholarship described above.

THE EMMET BLAKENEY GLEASON SCHOLARSHIPS provided through the generosity of the Gleason Works in memory of Emmet Blakeney Gleason. Limited to students in engineering. Criteria for award include academic promise, motivation for a career in engineering, and financial need.

THE GEOFFREY BROUGHTON MEMORIAL SCHOLARSHIP is provided by income from endowment. Eligibility is limited to students in Chemical Engineering. Criteria for award include character, academic promise, and need for financial assistance.

ROCHESTER SECTION OF AMERICAN INSTITUTE OF CHEMICAL ENGINEERS SCHOLARSHIP, is provided by annual grants made by the Section for a deserving student in Chemical Engineering.

THE ALUMNI REGIONAL CLUB SCHOLARSHIPS are sponsored by the Alumni of the University. The stipends are adjustable, depending upon the financial need of the recipient, with a maximum stipend of full tuition. Candidates for this award are nominated by the regional alumni clubs (Baltimore, Boston, Buffalo, Capital District of New York, Cincinnati, Cleveland, Detroit, Ithaca, Long Island, Niagara Falls, Northern New Jersey, Philadelphia, Pittsburgh, Rocky Mountain, San Francisco, Schenectady, Southern California, Southern Tier of New York, Susquehanna Valley of New York, Syracuse, Washington, Wayne-Ontario, Westchester (New York), Fairfield (Conn.), and Wilmington). From the nominees, three men and two women are usually selected for award in each entering class. Nominees may also be considered for other scholarship awards for which they may be eligible. Criteria for award include academic achievement and aptitude, character, personality, and participation in high school and community activities. Application may be made through the Admission Office or through the regional club presidents (whose names may be obtained through the Office of Alumni Relations). Nominations for Alumni Regional Club Scholarships should be forwarded not later than March 1, and the applications of the nominees must be complete and on file in the Admission Office by March 1. Nominees for Alumni Regional Club Scholarships are not required to file duplicate applications or any special forms.

THE AMERICAN SOCIETY FOR METALS SCHOLARSHIP IN METALLURGY is endowed by the Rochester Chapter of the American Society for Metals. Awarded to a senior engineering student who is studying in the metallurgy option, on the basis of personal qualifications, academic promise and financial need.

COLLEGE SCHOLARSHIPS AND OTHER SPECIAL SCHOLARSHIPS, are provided by donors or from general funds. Unless special stipulations have been made by the donors, the income from endowments is granted for scholarship aid on the basis of need as well as upon superior qualifications of character and personality, maturity of purpose, and high scholastic attainment. If a donor who has reserved the right to designate a recipient fails to do so, the scholarship may be awarded by the University. A proportion of the sum available for these scholarships is set aside for entering students; the remainder is used for the three upper classes.

# *Scholarships for Men*

The following Prize Scholarships are awarded in competition upon the basis of literary and scholastic ability and attainments, qualities of manhood, force of character, leadership, and interest in student activities:

**THE ALUMNI WAR MEMORIAL SCHOLARSHIPS**, one to be awarded in each class, supported by Alumni in memory of Alumni and undergraduates of the University who gave their lives in the service of their country. These scholarships are awarded on the basis of academic achievement, personal qualifications and general promise of the candidates. In making selections for award the Committee will give consideration to the candidate's financial need, but merit rather than need will be the factor of primary importance.

**THE CHARLES A. BROWN PRIZE SCHOLARSHIP**, endowed by the late Charles A. Brown of Chicago, A.B., 1879, awarded every four years to a candidate in the Chicago district.

**THE MICHAEL L. CASEY-T. RICHARD LONG ALUMNI SCHOLARSHIPS**, one to be awarded in each class, supported by annual contributions of Alumni in memory of Dr. Casey and Professor Long. The basis for award is the same as for the Alumni War Memorial Scholarship described above.

**THE MARTIN F. TIERNAN PRIZE SCHOLARSHIPS**, supported by a gift from Martin F. Tiernan, A.B., 1906. Terms of the gift provide that some awards may be made partly in the form of loans. (See the Martin F. Tiernan Loan Awards.)

**THE WELLES PRIZE SCHOLARSHIPS**, five in number, endowed by the late Francis R. Welles, A.B., 1875. These scholarships are awarded to candidates resident in the Chicago district.

**THE JOHN BRADLEY SCHOLARSHIP**, endowed by the late Inez A. Bradley, the recipient to be chosen by the President of the University in such manner as to him seems best.

**THE SOL HEUMAN SCHOLARSHIPS**, endowed by the late Sol Heuman, the recipients to be selected in equal numbers from each of three faiths: Protestant, Roman Catholic and Jewish.

**THE WILLIAM EASTWOOD SCHOLARSHIP**, endowed by Albert B. Eastwood in memory of his father and awarded every four years to a promising candidate in need of financial assistance.

**THE LUTHER EMMETT HOLT PRIZE SCHOLARSHIP**, endowed by the late Francis R. Welles, A.B., 1875, in memory of his classmate, Dr. Luther Emmett Holt, and awarded every four years to a candidate from Chicago or New York who intends to follow a premedical course.

**THE WILLIAM JUBSON HOWE PRIZE SCHOLARSHIP**, endowed by the late Ella G. Howe and awarded every four years without restriction as to the residence of the holder.

**THE NEW YORK ALUMNI PRIZE SCHOLARSHIP**, contributed by Alumni of the Greater New York area, and awarded every four years to a candidate residing in that area.

**THE GRAFLEX PRIZE SCHOLARSHIP IN MECHANICAL ENGINEERING**, endowed by Graflex, Inc. Awarded to a student at the beginning of his junior year in mechan-

ical engineering on the basis of personal qualifications, achievement and aptitude in this field. Preference is given to a child or grandchild of an employee of the company.

THE RAY HILL WHITE MEMORIAL SCHOLARSHIP, endowed by his widow, Frances French White, in memory of her husband, a graduate of the College in the Class of 1901.

THE UNION CARBIDE AND CARBON SCHOLARSHIP, sponsored by the Linde Air Products Division of that Company. Eligibility limited to students entering their senior year in engineering. Criteria for award include personal qualifications, achievement and aptitude in the field of engineering as well as financial need.

GENESEE VALLEY DELTA UPSILON FOUNDATION SCHOLARSHIP. Provided by the Foundation, to be awarded to a student on the basis of achievement, promise, and financial need. Members of the fraternity are given preference.

Other special scholarships are awarded only to men who meet the qualifications prescribed by the donors.



## *Scholarships for Women*

THE RUSH RHEES AND HARRIET SEELYE RHEES PRIZE SCHOLARSHIP, contributed annually by the Alumnae Association of The University of Rochester in honor of Dr. and Mrs. Rhees. This scholarship is awarded on the basis of high intellectual ability and attainment, strength of character, personality, and qualities of leadership.

THE ALUMNAE SCHOLARSHIPS, contributed annually by the Alumnae Association of The University of Rochester, Preference is given in the award to the daughter of an alumna needing financial assistance.

THE AUGUSTA LANEY HOEING SCHOLARSHIP, contributed by Alumnae of the Alpha Sigma Sorority in honor of Mrs. Charles Hoeing, an honorary member of the sorority. Preference is given to members of the Alpha Sigma Sorority.

NEW YORK ALUMNAE CHAPTER SCHOLARSHIP, contributed by Alumnae residing in the New York City area and awarded every four years to a candidate residing in the metropolitan district. Preference is given to the daughter of an alumna.

THE MARGARET PARKHURST MOREY SCHOLARSHIP, contributed by Alumnae of the Alpha Sigma Sorority in honor of Mrs. William C. Morey, an honorary member of the sorority.

THE SIGMA KAPPA UPSILON SCHOLARSHIP, contributed by the Sigma Kappa Upsilon Sorority. It is given to an undergraduate of that sorority upon recommendation of the Scholarship Committee of the sorority.

THE RIDA S. MOORE SCHOLARSHIP, endowed by the late Mrs. Clarence King Moore in memory of her husband, a former professor of the University. Awarded every four years.

THE SUSAN HUNTINGTON HOOKER SCHOLARSHIP, honoring Mrs. Horace B. (Susan Huntington) Hooker, daughter of Elon Huntington, a founder and trustee of the University, who was widely known and loved for her cultural and civic interests and activities in Rochester over a long lifetime. In providing for this scholarship, the donor expresses the hope that it will be of assistance to a woman undergraduate or graduate who gives promise of comparable service in her own community.

THE HAZEL WILBRAHAM MEMORIAL SCHOLARSHIP, named for an alumna and former professor of physical education, and provided by gifts from her former students.

# Student Loans

Loan funds, including National Defense Education loans, are available to aid students to whom scholarships are not granted; and, in many cases, loans are made in addition to scholarship grants. The basis for the selection of students to whom loans are made is the same, in principle, as for the selection of scholarship holders. Loans may be made, however, to students whose academic standing is somewhat lower than that required for a scholarship. Ordinarily loans are not granted to students whose point-hour ratio is less than two. The ability of the student to repay what he borrows receives careful consideration in all cases before a loan is granted.

**Loan Applications** Students are urged to discuss with the Committee on Student Aid their probable needs for some time in advance. Loan applications are, however, received at any time. Forms for application are available at the Office of the Director of Admissions and Student Aid. When the Committee on Student Aid approves a loan, the applicant receives a letter of introduction to an officer of a local bank. Favorable reception of the application by this officer will result in the granting of the loan.

**Interest and Repayment** All arrangements regarding the payment of interest and repayment of principal must be made at the bank where the loan is secured. Interest payments made before graduation, strictly in accordance with such arrangements, will be credited toward the principal of the loan. Arrangements for repayment after graduation must be made with the bank. After graduation the rate of interest to the University is two per cent on the McGuire Fund and five per cent on all other loan funds, except on the Foley Fund; no interest is charged on loans from this fund. The bank will, however, collect interest at its current rate on all loans; whatever is paid in excess of the percentages of interest stated above will be credited to the principal upon the final payment of the loan.

Repayment of part or all of a note may be made before the date of maturity. Funds received from the repayment of loans become immediately available for loans to other students.

**The Martin F. Tiernan Loan Awards** This loan fund, established through the generosity of Martin F. Tiernan, A.B., 1906, is available to men who meet the University's standards for character, academic work and promise, and eligibility for loan aid.

These awards, which are limited to students who are earning a part of their own college expenses, are made for the freshman year in the first instance, but may be renewed for succeeding years by the Committee on Student Aid, at its discretion. Each recipient of an award from this fund shall prepare his personal Budget in advance of each college year, and shall keep an accurate account of his personal expenses through each year submitting these to the Chairman of the Committee on Student Aid for approval at stated intervals. Recipients of awards from this fund shall be known as "Martin F. Tiernan Scholars."

***Kellogg Loan  
Fund for  
Students in  
Nursing***

This fund is available through the generosity of the W. K. Kellogg Foundation for the use of students in the four and one half year nursing course in the Arts College. Interest is charged at the rate of two per cent per annum.

***The Victor J.  
Chambers  
Loan Fund***

A fund, contributed by the friends and former students of Professor Victor J. Chambers, B.S., '95, who served on the faculty from 1908-1939, is available for loans to students in chemistry and chemical engineering. Loans from this fund may be made to either graduates or undergraduates and may be for studies either at Rochester or other institutions. Applications, submitted to the Director of Student Aid, are acted upon by a special committee of the faculty.

***The Professor Horace W. Leet  
Loan Fund***

A fund established by students in honor of Professor Leet's thirty-nine years of devoted service on the engineering faculty. This fund is available to any student in the engineering college without involvement in formal channels. The administrator of the fund should be contacted for details.



## *Student Employment*

Each student is expected to devote full time to his academic work, but under certain circumstances arrangements can usually be made whereby he may earn a limited amount of money to help defray college expenses. It is important, however, that a student have enough money on hand or in sight upon entering college to meet the expenses of at least his first year. If work is needed, application may be made at the Office of Admissions and Student Aid concerning opportunities for part-time employment on or off campus. Ordinarily part-time work schedules should not exceed fifteen to twenty hours per week. Each year students obtain part-time employment on the campus in a variety of places, the library, the book store, departmental offices, laboratories, residence halls, dining halls, fraternity houses, and off campus in such places as retail and industrial firms, restaurants, hotels, and private homes.



## *Fellowships and Prizes*

**T**HE University offers prizes and fellowships to encourage superior work in connection with regular college studies, or to stimulate interest in subjects allied to college courses.

Competitors for graduate fellowships and undergraduate prizes must be candidates for a degree.

A student, if on probation or on warning, may not compete for a prize except with the consent of the Dean of Students.

No prize shall be awarded unless at least one candidate offers work of marked excellence.

All essays for which prizes are awarded shall be deposited in the University library for the use of the public.

Full details about fellowships and prizes, terms of competition and award, persons in charge, and the form in which essays should be submitted may be obtained from the Office of the Dean of Students.

Full information about graduate fellowships, scholarships, and assistantships may be secured from the Associate Dean for Graduate Studies.

## Undergraduate Prizes

For information regarding these prizes, consult the School, College or Department concerned.

**Biological Sciences** THE DONALD R. CHARLES MEMORIAL AWARD originating from funds subscribed by students, colleagues and friends of Professor Charles, is given annually to a worthy student who, in the judgment of the Department of Biology, shows promise of a kind which Professor Charles so regularly encouraged and aided. The award provides a sum to cover limited expenses or tuition costs for an undergraduate or graduate student who wishes to carry on advanced studies, or some special project, during the summer months. In special cases the award may be made for a period within the academic year.

THE CHESTER A. DEWEY SCHOLARSHIP of \$150, awarded for proficiency in biological work, provides free tuition at the summer session of the Marine Biological Laboratory at Woods Hole, Massachusetts, or at any other recognized biological laboratory.

THE RIGBY WILE PRIZE IN BIOLOGY of \$30.00 is awarded to a member of the freshman or sophomore class for proficiency in Biology 101-102.

**Economics and Business Administration** THE WILLIAM MORSE HASTINGS PRIZE of \$60.00 is awarded each year for the best essay or thesis upon some topic on the history of industry, to be selected by the Chairman of the Department of Economics and the Director of the School of Business Administration.

**Economics** THE JOHN DOWS MAIRS PRIZE of \$150 is awarded annually to the member of the junior class who has done the best work in concentration in economics.

THE SHERMAN FELLOWSHIP of \$500 awarded in alternate years, was endowed by Isaac Sherman of New York as a graduate fellowship in the Department of Economics. The next award will be made in June, 1962, to that student of the Class of 1961 or 1962 who has shown the highest ability in the work of the Economics Department and who has completed not less than eighteen hours in that department. The sum is payable upon approval of the President of the University after the recipient has registered for a year of graduate study in economics.

**Engineering** THE EMIL KUICHLING PRIZE of \$125 is awarded annually to that man of the class in applied mechanics who has shown the greatest proficiency in the work of the course.

THE CHARLES L. NEWTON PRIZE of \$60.00 is awarded to a student in the "Department of Applied Sciences who shall show a special proficiency in some subject connected with that department, either in oral or in written examination or by thesis."

THE MARIE PETZ LEHMANN PRIZE of \$50.00 is awarded annually to the full-time mechanical engineering major who has shown the most improvement from his freshman through his junior year.

THE TAU BETA PI PRIZE of \$25.00, donated by the Rochester Alumnus Chapter, is awarded each year to the senior engineering student who, in the opinion

of the Faculty of the College of Engineering, through academic achievement, proven leadership and sterling character has excelled and inspired his fellow students in the College of Engineering.

**English** THE ALUMNAE PRIZE of \$10.00, provided by the Alumnae Association, is awarded annually to the woman in the sophomore class who has done the best work in English during her sophomore year.

THE CHARLES ELLIS CALDWELL PRIZE of \$125 is awarded annually to the man of the senior class who in his college work has shown the greatest proficiency in the Department of English.

THE DAVIS PRIZES, founded in 1864, of \$35.00 and \$25.00 respectively, are awarded to the two men in the graduating class whose original expository or persuasive speeches exhibit the highest excellence in content, organization, style and delivery.

THE DEWEY PRIZES, founded in 1866, of \$20.00 and \$10.00, are awarded annually to the two men in the sophomore class whose original expository or persuasive speeches exhibit the highest excellence in content, organization, style and delivery.

THE HULL PRIZE of \$60.00 is awarded to the man in each senior class concentrating in English who has done the best work in English studies.

THE SUSAN B. ANTHONY PRIZE of \$25, first offered in 1955, is awarded annually to the woman of any class whose original expository or persuasive speech exhibits the highest excellence in content, organization, style and delivery.

THE WILLIAMS MEMORIAL PRIZE of \$60.00 is awarded to the woman in the senior class concentrating in English who has done the best work in that department.

**Fine Arts** THE ELIZABETH M. ANDERSON PRIZE of \$50.00 is awarded annually to that student who shows the highest proficiency in some subject connected with art.

**French** THE NEIL C. ARVIN MEMORIAL PRIZE of \$150, established by the students, colleagues and friends of Professor Arvin, is awarded annually to the student in the senior class who has excelled in French during his undergraduate course.

**German** THE E. P. APPLETON MEMORIAL PRIZE in German of \$100, provided annually by the Federation of German-American Societies of Rochester, is awarded each year to a student of German in the University of Rochester for progress toward over-all proficiency in spoken and written German.

THE KREYER PRIZE in German of \$60.00 is awarded for facility in spoken German.

**Greek** THE RUSSELL MUMFORD TUTTLE PRIZE of \$75.00 is awarded each year to a man student for proficiency in the study of Greek.

**History** THE N. B. ELLISON PRIZE of \$65.00 is awarded to the man in the senior class concentrating in history who has done the best work in that department.

THE HUGH MACKENZIE PRIZES, amounting to approximately \$80.00, provided

from income from the Hugh MacKenzie Memorial Fund raised by friends, colleagues, Alumnae, and Alumni to honor the memory of Professor MacKenzie, are awarded each year to the woman student who has shown the highest achievement and interest in History 101-102 and to the woman student who has shown the greatest improvement in the same course.

**Languages** THE SIGMA KAPPA UPSILON PRIZE of \$10.00 is awarded annually to the woman student who has shown the greatest achievement in a foreign language.

**Mathematics** THE STODDARD PRIZES, of \$35.00 and \$30.00 in mathematics, are awarded annually to two men pursuing the course in analytic geometry and calculus.

**Physics** THE STODDARD PRIZE of \$35.00 is awarded to the man in each graduating class who shall present the best thesis on some assigned topic of investigation in physics.

**Political Science** THE JAMES D. MCGILL MEMORIAL PRIZE of \$100.00, established by former students and friends of Professor McGill, is awarded annually to that undergraduate student who is deemed to have shown the greatest interest and demonstrated the highest achievement in the field of political science. The names of annual recipients will be recorded on a plaque hung in the classroom where political science classes meet.

THE TOWNSEND FELLOWSHIP of \$700 awarded in alternate years, was endowed by Charles John Townsend of Lockport, New York, as a graduate fellowship in the Department of Political Science, in memory of his father, John Pomeroy Townsend, LL.D., who founded the fellowship in 1876 and supported it by annual payments for many years. The next award will be made in June, 1961, to that student of the Class of 1960 or 1961 who has shown the highest ability in the work of the Department of Political Science and who has completed not less than eighteen hours in the Department of Political Science or History.

**General** THE JESSE L. ROSENBERGER PRIZE of \$30.00 is awarded to the man in the junior class whose work has shown the greatest improvement during the freshman and sophomore years.

THE SUSAN COLVER ROSENBERGER PRIZE of \$30.00 is awarded to the woman in each junior class whose work has shown the greatest improvement during her freshman and sophomore years.

THE TERRY PRIZE of \$150 is awarded annually to that man of the senior class who by his industry, manliness, and honorable conduct has done most for the life and character of the men of the River Campus.

THE THETA ETA PRIZE of \$25.00 is awarded annually to the senior woman who through her participation in campus life and by her influence, personality and achievement has contributed most to the River Campus.

THE GAMMA PHI PRIZE of \$25.00 is awarded each year to the sophomore woman who has contributed most to the general advancement of the River Campus.

THE PERCY B. DUTTON PRIZE of \$125 is awarded each year to that male member of the graduating class who in the opinion of the Dean of Students shall have

excelled all his men classmates in wholesome, unselfish, and helpful influence among his fellow students.

THE LOUIS A. ALEXANDER ALUMNI AWARD, in the form of a trophy, is to be presented annually to a male member of the senior class who has made an outstanding contribution to student life through his significant achievements in athletics and general student activities; and whose character and leadership qualities have been a wholesome influence on his fellow students.

THE JOSEPH P. O'HERN SCHOLARSHIP for Travel and Study in Europe was endowed by the late Joseph P. O'Hern, of the Class of 1892. This scholarship was awarded in 1954 and thereafter in alternate years will be awarded to a graduate who has been elected to Phi Beta Kappa, and who wishes to prepare for a career in teaching. A committee, composed of the Dean of Students as chairman and the President and Secretary of the New York Iota Chapter of Phi Beta Kappa will select the recipients. The selection for 1962 will be made from eligible persons in the Classes of 1960, 1961, and 1962. The stipend will be \$2000.

THE JANET HOWELL CLARK PRIZE of \$40.00 is to be awarded yearly in recognition of the esteem held for Dr. Clark, former Dean of the College for Women, by the Class of 1953. This Prize is to be given yearly to the Senior woman who has shown the greatest promise in creative work in one of the following fields—Physics, Chemistry, Biology, Astronomy—and who has shown outstanding versatility in the mastery of allied fields. She is to be chosen by the Dean of Students upon recommendation of the Chairmen of the Departments of Physics, Chemistry, Biology, and Astronomy.

THE JOSEPH O'CONNOR GRADUATE STUDY ENDOWMENT FUND, endowed by a bequest from Evelyn O'Connor, is awarded annually to a woman in the graduating class who has shown marked ability in Original Writing, in English Literature, in Classical Languages and Literature, or in Archaeology. A committee composed of the Dean of Students, the Chairman of the English Department, the Chairman of the Foreign Language Department, Miss Eleanor Gleason, and Mrs. Alling Clements will select the recipient.

THE FANNIE R. BIGELOW ALUMNAE AWARDS, silver trays bearing the insignia of the University, endowed by a fund contributed to the University in Mrs. Bigelow's memory by members of her family, will be presented to an undergraduate woman on Susan B. Anthony Day, and to an alumna by the Alumna Association. These awards will be given in recognition of the importance of the contributions made by women to the cultural, intellectual, and civic life of their communities.

THE DELNO G. SISSON PRIZE FUND of \$25 is awarded annually to the freshman who in the opinion of the faculty has shown the most improvement not only in college work but in adjusting himself to university life and the student body.

SCHOLARSHIP CUPS, one for men and one for women, are awarded annually to that fraternity and to that sorority whose average scholarship for the preceding year has been the highest.





## *Special Services* FOR UNDERGRADUATES

**T**HE aim of the Office of the Dean of Students is to provide each student with an opportunity to develop to his fullest intellectual, spiritual, and social capacity. The student services are coordinated in the staff of the Office of the Dean of Students which includes the Associate Dean of Students, the Assistant Dean of Students, the Director of Men's Residence Halls, the Director of Women's Residence Halls, the Director of Student Activities, the Director of Testing and Counseling Service, Vocational Counselors, and Placement Officers.

Service is provided to students through a variety of persons and agencies many of which are described elsewhere in this bulletin. Each student, upon admission, is assigned to a member of the faculty who serves as his academic adviser during his first two years, and is available to counsel him on non-academic matters as well. Students are often referred by their advisers to other members of the staff of the University for assistance. During his last two years each student is assigned a faculty member in the department of his field of concentration for academic guidance. The staff of the Office of the Dean of Students will counsel juniors and seniors who seek assistance in non-academic matters.

Additional counseling services are available to students in the following persons or agencies:

Medical Officers, members of the Departments of Physical Education, Director of Religious Activities, adviser to the University Protestant Fellowship, adviser to Jewish students, adviser to Catholic students, Directors of Student Aid, Placement Office, Vocational Counselor, the Testing and Counseling Service, the Psychological Clinic and the Department of Psychiatry.

**Placement** The Placement Officers help current graduates to obtain suitable positions. Placement assistance continues to be available to graduates of former years whenever they are seeking new employment. There is no charge for this service.

Each student is urged to register with the Placement Office early in the senior year in order to take advantage of both on-campus and off-campus interviews before and after graduation.

Good contacts are maintained with business firms, governmental agencies and educational and social institutions for the purpose of obtaining information concerning the general employment situation and specific opportunities open to students and graduates. Personnel representatives from approximately 200 firms come to the Placement Office each year to interview graduating students.

Placement credentials compiled in the senior year are kept in a permanent file for use by potential employers of seniors and alumni.

Students who desire assistance in obtaining summer employment may register with the campus Placement Office early in the spring. Whenever it is possible, summer placements are made with the aim of helping the student gain work experience in line with his career objective.

### *Educational Placement Bureau*

The Bureau is maintained to assist University of Rochester students and graduates in securing teaching positions and to assist school officials in filling vacancies.

Students in all schools, colleges, or departments of the University of Rochester may register with the Bureau by paying a permanent registration fee of \$2.00. The office of the Bureau is in Room 205, Dewey Hall.

### *The Testing and Counseling Service*

The Testing and Counseling Service, sponsored by the Office of the Dean of Students, is available for the students and faculty of the University of Rochester. Requests for testing and counseling of high school students and recent high school graduates will be accepted as staff and time permit. The typical fee for testing and counseling individuals outside the University seldom exceeds \$25.00.

Student counseling which supplements the services provided by the faculty, Faculty Advisers, religious advisers and the Deans is available. Special attention is given to study skills, reading difficulties, and vocational and educational planning. Complete testing service is provided to aid in appraising students' aptitudes, interests, personality traits and related factors. Emphasis is placed upon counseling initiated by the student and every effort is made to assist each individual in accepting responsibility for his decisions and actions.

Group activities for both men and women, sponsored by students, counselors and alumni, include career coffee hours, and discussion meetings in lounges on campus and in alumni homes. Students thus meet representatives of various vocations and professions while they are forming their vocational goals.

The tests given to all entering students during Freshman Week are administered and scored by the staff of the Testing and Counseling Service. Other tests administered periodically during each year include the Graduate Record Examination, Medical College Admissions Test, the Navy College Aptitude Test, Law School Admission Test, tests of the National League for Nursing, and the National Selective Service Test.

The Testing Service renders assistance, upon request, to the faculty in the construction, scoring and interpretation of course examinations.

Area colleges, high schools, and elementary schools may obtain information regarding the cost of test scoring and other statistical services by contacting the Testing and Counseling Service, The University of Rochester, River Campus Station, Rochester 20, New York.

## *Health Service*

The health of the student body is under the care of physicians at the Student Health Service. The out-patient department for men and women students is housed in the medical office in the men's gymnasium. Infirmary patients, both men and women, are housed in the Women's Residence Halls. The infirmary is open twenty-four hours daily for the treatment of all types of illness; complicated cases are admitted to the University Medical Center directly or by transfer from the infirmary on the recommendations of the student health physicians. Short term psychiatric care is available through the Department of Psychiatry in the Medical School.

All full-time students are entitled to the services of the medical officers and to such infirmary, dispensary or hospital care as may be thought necessary by the medical officers provided the cost does not exceed \$80.00 in any one academic year. Hospital service is limited. It is expected that students will pay for unusual medications or prolonged hospitalization. Elective surgery, refractions, and dental care are not provided under the program. No care is provided resident students during vacation periods.

If a student prefers to go to a private physician or hospital for treatment, the cost of such treatment and care becomes his or her responsibility.

All entering students must be vaccinated, or submit evidence of recent successful vaccination. Before matriculation, a preliminary medical examination is required, and the correction of remedial defects is urged.





## *Student Life* AND INTERESTS

**S**TUDENT LIFE on the River Campus is centered around the students place of residence and the student activities building. A flexible program of activities is encouraged to meet the varying interests of the student body. This program offers an opportunity to develop both vocational and avocational interests, to learn leadership skills, to foster friendships, and to promote opportunities for wider acquaintance between faculty and students.

Todd Union, the student activities building, provides a popular gathering place for students in its Snack Bar and main lounges. The building is the center of the organized activities program housing the offices of student government, college publications, the campus radio station, and other groups as well as being the headquarters for the musical and religious organizations. Also, in Todd Union is a branch of the United States Post Office, and student mail boxes. Rooms are available for scheduling meetings and social events.

The Women's Residence Halls includes an attractive co-educational recreation room and snack bar as well as lounges for use of groups and individuals.

**Students Association** Every full-time student on the River Campus is a member of the Students Association which is governed by a cabinet of eighteen elected student delegates. The Cabinet has general responsibility for the development and supervision of the extracurricular activities and for the maintaining of high standards of student life. The government bodies in the residence halls are the Interhall Council for men and the Women's

Council. The Hellenic Council and the Intersorority Council handle the special problems of the fraternities and sororities.

In addition to the opportunities for participation in extracurricular life through the student government program, there are many areas in which individual interests and skills can be fostered.

In publications, students obtain editorial, business and advertising experience. Publications include the *CAMPUS TIMES*, a bi-weekly newspaper; *INTERPRES*, a yearbook edited by the Junior Class; *PROLOGUE*, a bi-annual literary magazine; *UGH*, a bi-annual humor magazine; a directory; a handbook; calendar; and the *ROCHESTER INDICATOR*, the publication of the engineering students.

Dramatics productions include the *Stagers*, an organization under the direction of a faculty member, which provides two plays yearly; an experimental theatre group under student directorship; and *Co-Kast*, a student group, which produces a recent Broadway musical show each fall. In the spring the men and women students each put on their own student written, student directed musical comedy show. The Debate program as participated in by the Forensic Society is both intercollegiate and intramural.

Social Service organizations, the Outing Club, Sailing Club, Organization on International Affairs and others including the Bridge Club provide a wide range of outlets for the individual student's personal interests. Departmental clubs give students the opportunity to become acquainted with faculty and with other students with similar academic interests.

*Athletics* Ample provision is made for athletic interests. Intercollegiate sports include baseball, basketball, football, golf, soccer, tennis, swimming, track, wrestling, squash, and sailing. Intramural contests are an important part of the program.





*The athletic policy of The University of Rochester has been developed to further the best interests of the students who participate in intercollegiate athletics.*

The definite objectives are to afford as many men as possible experience in intercollegiate sports; to devote only as much time to athletics as is necessary to give the participants all the worthwhile values that are derived from such participation, with as little interference with their scholastic endeavors as is possible; to arrange schedules, the playing of which entails only a minimum loss of time from classes, and, as far as practical, with teams of approximately the same ability, representing institutions not only of about the same enrollment of men but also of similar educational standards and athletic ideals; to have the membership of all varsity teams composed of students successfully carrying a full program of work and who play for recreation.

To this end, the University does not subsidize its teams. Members of all athletic squads must meet the same entrance requirements and scholarship standards required of the student body in general, and they enjoy the same privileges as are granted other qualified students.

Women's sports are sponsored by the Women's Athletic Association and include archery, badminton, baseball, basketball, dancing, fencing, hockey, riding, swimming, tennis and volleyball. Women students participate in Play Days with women's groups from other colleges. Dancing is an important part of the program and is sponsored through a Dance Club.

### *Honorary Societies*

Honorary societies include Phi Beta Kappa, Sigma Xi, Tau Beta Pi, Delta Phi Alpha and Phi Sigma Iota. There are, in addition, the following local honorary organizations: Marsiens for senior women, Keidaeans for senior men, Mendicants for junior men, Yellow Key for sophomore men and D'Lions for sophomore women.

### *Fraternities, Sororities*

There are eleven social fraternities for men and five for women. Ten of the eleven men's fraternities are national; the eleventh, and all of the sororities are local groups. The fraternities are Alpha Delta Phi (1851), Delta Upsilon (1852), Delta Kappa Epsilon (1856), Psi Upsilon (1858), Theta Delta Chi (1867), Kappa Nu (1911), Theta Chi (1920), Beta Delta Gamma (1926), Sigma Chi (1932), Tau Kappa Epsilon (1954), and Sigma Alpha Mu (1954). The sororities are: Theta Eta (1903), Alpha Sigma (1903), Theta Tau Theta (1906), Gamma Phi (1909), Sigma Kappa Upsilon (1923). The Hellenic Council and the Intersorority Council deal with the common interests of the respective groups.

Careful thought is given to social life on the River Campus. Social functions are sponsored each weekend by residence and social groups and are coordinated through a social calendar.



## Student Residence

*Housing for Men* Undergraduate men from outside the Rochester area are provided with housing in residence halls and fraternity houses on the River Campus. Six residence units provide living quarters for about 1,000 students. About 150 upperclassmen live in eight fraternity houses. Tiernon and Gilbert halls house freshmen.

Each of the residence halls is operated as a unit. The students in each residence unit plan and participate in a social program within the hall. Student government is largely responsible for both social life and conduct. The facilities within the halls include lounges, game rooms, typing rooms, kitchenettes, and laundry equipment. Dances, student-faculty coffee hours, intramural sports competition, ping-pong tournaments, and group discussions of current issues are typical of the social program within the residence units. Through activity of this sort each student is given experience in group living which will supplement his academic training.

Selected students for advanced degrees live in the residence halls as advisers. They are aided by a group of undergraduates who also serve as advisers. A close contact is maintained between the residence advisers and other counselors. It is the duty of the residence hall advisers to help individual students with their problems, direct students to other advisory agencies in the University, and develop the individual halls as social units which will reflect the social and intellectual spirit of the University. The advisory program within the halls is coordinated by the Director of Residence Halls for Men.

Annual room rentals in the residence halls range from \$306 to \$351 per academic year. Both single and double rooms are available. The Men's Dining Hall is located across the street from the residence quadrangle. Additional recreational and activities facilities are provided in Todd Union, which is also where students receive their mail.

Student rooms are equipped with desks, lamps, desk chairs, lounge chairs and beds. Linens (two sheets, one pillow case, two bath towels) are furnished and a weekly exchange provided. Students furnish their own blankets, bedspreads, and drapes.

Full-time students on the River Campus, except residents of the city, live on campus unless excused by the Dean of Students. Freshmen must live in the residence halls and upperclassmen in the residence halls or fraternity houses. Students who reside in or near the city who wish to live on campus will be accommodated to the extent that space is available.

Unique and adequate facilities for non-resident men students are provided in the Men's Residence Halls. City students affiliate themselves with a Residence, have full use of the city men's lounge and locker room, and take full part in all the activities and social functions of the Residence. All non-resident freshmen participate in these programs as well as upperclassmen who wish to do so. There is a \$5.00 fee for those in the program which also covers the expenses for non-resident freshmen who stay in the residence halls during Freshmen Week. Several rooms are provided in the Residence for non-resident men. These rooms are furnished with bunk beds and dressing facilities. Men may stay overnight in these rooms at any time at a cost of fifty cents per night, with linen furnished for an additional fifty cents.

Detailed information regarding the residence halls will be sent with the room application which is mailed upon payment of the entrance deposit fee. Any questions concerning the residence halls should be addressed to the Director of Residence Halls for Men, River Campus.

**Housing for Women** Excellent accommodations for women students are provided in the Women's Residence Halls on the River Campus. This modern seven-story building, built in 1955, offers many new and unique features for student living and social activities. There are spacious lounges and terraces on the main floor, music rooms and libraries, and a dining room which may be divided into four smaller dining rooms for a more intimate atmosphere. On the ground floor there is a coeducational recreational room with a snack bar. Situated on the seventh floor is a modern automatic laundry, solarium and sun-deck for the use of the women residents, and on each of the living floors there are two lounges, kitchenettes, and small laundry rooms.

Both single and double rooms are provided. The rate for a single room is \$350 per academic year, and the rate for a double room is \$310 for the academic year. All undergraduate women from outside the Rochester area are expected to live in residence. Students who reside in or near Rochester will be accommodated to the extent that space is available.

Student rooms are spacious and fully furnished with desks, beds, chairs, lamps, bookcases, chest of drawers, and built-in closet units for each occupant. The interiors of the rooms are furnished in contemporary style, decorated in warm colors, and highlighted by large picture windows with harmonizing draw-curtains.

Students furnish their own blankets, bedspreads and pillows. Freshman women are advised to wait until they arrive on campus to purchase bedspreads.

Linens (2 sheets, 1 pillow case, 2 bath towels) are furnished and a weekly exchange of 1 sheet, 1 pillow case, 2 bath towels is provided.

The advisory system of the Residence Halls is under the administration of the Dean of Women, and includes a Director of Women's Residence, a Head Resident and graduate Assistants. Their duties include the supervision of the four wings of the residence hall, personal counseling, advising of women students in their activities and social affairs, and supervision of the coeducational recreation program in the halls. Specially selected upper class women serve as Freshman Counselors and live on the freshman corridors throughout the year.

The social program of the Residence Halls is planned and carried out mainly by the Women's Council and its standing committees, and includes a variety of women's activities and coeducational events. Throughout the year there is a full calendar of social occasions such as traditional women's college suppers, conferences, faculty coffee hours, formal and informal dances and parties, teas and receptions, pajama parties, picnics, open houses, and game nights.

All phases of community living, standards and regulations for women are also under the jurisdiction of the Women's Council, which is the legislative and administrative body in the Women's Residence Halls. This Council is made up of an executive board, elected corridor representatives, and standing committees. Women students at Rochester operate on an Honor System in matters of standards of conduct and community life, and every woman is considered to be a participant in this form of government. Administration of the Honor System is under the jurisdiction of an Honor Board.

Unique and adequate facilities for non-resident women students are provided in the Women's Residence Halls. City students affiliate themselves with the

Residence, have full use of all social areas in the building, and take part in all the activities and social functions of the Residence. Several rooms are provided on the corridors of the Residence for the use of non-resident women. These rooms are furnished with bunk beds and dressing facilities. Non-resident women may stay overnight in these rooms at any time at a cost of fifty cents per night, with linen furnished for an additional fifty cents. Non-resident women are welcome in the dining room at all times and may buy their meals on a cash basis.

Further information will be sent with the application for a room, or may be had by writing to the Director of Women's Residence Halls.

**Room Deposits** Both men and women students who live in residence halls are required to deposit the sum of \$10.00 with the Accounting office against which charges may be made for damage to the halls. For new students, this deposit is taken from the \$50.00 deposit fee paid prior to entrance. During the period of residency occupancy charges of \$2.00 or less are held against the deposit. Charges amounting to more than \$2.00 are billed through the Accounting Office after advance notification to the resident.

**Men's Dining Hall** The Men's Dining Hall provides dining facilities for men students and their guests. In addition to the beautiful and gracious main dining hall, there are several small private dining rooms for special parties. Breakfast and lunch are served cafeteria style; dinner is served by student waiters. A board plan is compulsory for all students. Additional facilities for student recreation and social life as well as the Faculty Club are housed in the building.

**Women's Dining Hall** All women residents are expected to take their meals in the residence dining room. The board plan includes all meals during the week except Sunday evening supper. Breakfast and lunch are served cafeteria style; dinner is served by student waitresses. A snack bar is open in the residence Sunday evenings for students wishing to buy supper on the campus.





## Religion

The University of Rochester was founded by men of strong religious convictions. Although the school has no tie with any particular denomination, it recognizes the importance of religion in campus life.

A Director of Religious Activities is appointed by the University to counsel with students and to coordinate the activities of all religious groups. He serves as chaplain to Protestant students on an interdenominational basis, assisted by chaplains or advisers to Protestant denominational groups. Working with him are chaplains for Roman Catholic and Jewish students, provided by their own organizations for work at the University.

### *Religious Organizations*

Voluntary student religious interest finds its expression through the activities of various campus organizations. Protestant students are organized through a University Protestant Fellowship which meets bi-weekly for study and discussion and which sponsors many

other activities. Working closely with the Student Christian Association and operating as part of its total ministry are the Baptist Student Association, the Canterbury Club, the Lutheran Student Association, the Wesley Foundation, and the United Campus Christian Fellowship. A Christian Science group, a Unitarian-Universalist group, and an Inter-Varsity Fellowship meet during the month. Catholic students are organized through a Newman Club which meets every other week for a talk and discussion, holds retreats, and provides social fellowship. Study groups are held for freshman students, and for upper-classmen. Jewish students are organized through a chapter of the Hillel Foundation which sponsors cultural meetings, breakfasts, religious discussions, and social activities. All of the religious groups on campus are represented on an inter-religious council which coordinates programs and sponsors joint activities, such as brotherhood dinners, coffee hours, and the Campus Conference on Religion. It also takes an active interest in campus life, social service, and international affairs.

**Chapel** University Protestant Chapel services are held each Sunday morning at 11 o'clock in Strong Auditorium. The University Chaplain preaches at all services except one each month when a distinguished clergyman, recognized for national leadership, is invited to bring the message. The University Chapel Choir sings at these services.

Mass is celebrated each Sunday morning at 11 o'clock in the West Lounge of Todd Union.

Jewish services are held on Friday evening in the upper lounge of Todd Union.

Holy Communion is served by the Episcopalian Chaplain each Sunday at 9:30 A.M. in the Men's Dining Center Lounge.

**Religious Center** Offices for the Director of Religious Activities and for the various chaplains are provided on the second floor of Todd Union. A lounge is available there for group meetings and other facilities of Todd Union are available for use. Opposite the lounge is located a room set aside for prayer and meditation, open to all students.

## Musical Activities

The program of musical activities is designed to contribute to the artistic and aesthetic development of the student. Opportunity is provided for students with musical interests to participate in active choral and instrumental organizations.

**The Men's Glee Club** A group with over seventy years of activity behind it, sings at numerous functions of the University and makes a significant contribution to the cultural life of the city of Rochester through its appearances with the Rochester Philharmonic Orchestra, in concerts for high schools, local industries, and service clubs. Television appearances and spring tours that take the Glee Club to cities and communities in many parts of this country and Canada round out the activities of one of the University's most outstanding organizations.

*The Women's Glee Club* With a membership of one hundred girls selected for their vocal ability, appears locally and for special events at the University. In addition, the organization sings with the Men's Glee Club in a joint program each year and presents a pair of concerts with some outstanding men's chorus from another Eastern university.

*The University Chapel Choir* Functions primarily in connection with the Protestant Chapel and is open to students from all schools and colleges of the University. In addition to providing choral support to the weekly worship service, the University Chapel Choir from time to time presents special musical programs of a religious nature. The finest literature selected from the *a cappella* music of the sixteenth century, the great cantatas and oratorios of the masters, and contemporary sacred compositions are studied and performed.

*The All-University Symphony Orchestra* Draws its membership from the student bodies, faculties, and alumni of all schools and colleges of the University. Outstanding soloists are occasionally featured in the several concerts which are presented each year in Strong Auditorium.

*The Marching Band* Open to both men and women, provides music and "half-time" spectacles for home football games. The band accompanies the football team to at least one out-of-town game. During the second semester the CONCERT BAND is organized and prepares musical presentations for other University functions. Repertoire includes original music for band, arrangements of the symphonic masterpieces, and marches.

## Student Conferences

Among the most stimulating events of the college year are the student conferences held on subjects of wide interest and significance, such as recent ones on "Freedom to Dissent," "The New India," "Human Rights," "The Western Impact on Contemporary Africa", "Social Nonconformity: Studies in Deviant Behavior" and "The Open and Closed Society." Men and women of national and international reputation in various fields are invited as speakers, and formal sessions are followed by coffee hour discussions at which students may question the speakers. The undergraduates take a prominent part in the planning and conduct of the programs. Costs of the conferences are defrayed from funds for public lectures provided by the late Jesse L. Rosenberger, of the Class of 1888, and the late James G. Cutler of Rochester, and from general funds of the University.



# *General Regulations*

**General Responsibility** Each student is expected to abide by such rules as the University and its faculties may enact but he also assumes the responsibility to conduct himself in such a manner as is consistent with accepted standards of good citizenship, honesty, and propriety; with proper regard for the rights of others and the obligations of a member of the academic community. At its discretion, the University may delegate to student groups certain judicial and disciplinary responsibilities and the student must abide by the decisions of such groups as if made by the University itself.

**Terms and Vacations** Terms and vacations of the college year are indicated on the calendar printed on page 2.

**Attendance** All teachers are required to keep a record of attendance and to report absences to the Faculty Advisers. Responsibility for attendance of juniors and seniors is assumed to rest directly upon the student.

This privilege is extended for each term to those members of the sophomore and freshman classes whose names appear on the Dean's List.

**Report of Illness** Absence from any college exercise on account of illness should be promptly reported to the Medical Officer even though the student is under treatment by another physician.

**Marriage** If a student plans to be married during an academic year, the Office of the Dean of Students should be notified at least two weeks in advance. It is also expected that parents or guardians have been fully informed.

A student in the residence halls who marries during an academic year must obtain permission from the appropriate dean in order to retain a room in the residence halls. Marriage and withdrawal from the residence halls does not release a student from a room contract.

**Student Cars** Students driving cars on campus are required to register them. Freshman and sophomore resident students are not permitted to bring cars to the University.

**Resident Requirement** The minimum residence requirement for the bachelor's degree is one full academic year, according to the requirements of the New York State Department of Education.

**Program Approval** During the second term of each year at a specified time each student must obtain approval from his adviser for the studies he intends to pursue in the following year. A special fee of \$5 is charged each student who fails to obtain program approval by the prescribed date.

**Dropping of Courses** 1. During the first four weeks of any semester, a student may drop a course if the elimination of such course does not drop his program below a minimum of fourteen semester hours of registration and if he has the consent of the instructor of the course and also of his faculty adviser or departmental counselor. He may drop a course even though his academic program is reduced to fewer than 14 hours if the instructor, the adviser, and the Dean of Students give their approval. Such dropping shall be without penalty.

2. Only during the first four weeks of each semester may a student change his registration from one course to another. Such change requires the approval of the faculty adviser, the instructor of the course being dropped, and the instructor of the course being added. Such change shall be without penalty.

3. After the Friday of the fourth week of each semester, no changes in registration shall normally be permitted. Exceptions to this rule may be defined as follows:

a. The student whose grade in a given course by mid-term is *E* may, with the permission of the instructor in the course, the faculty adviser or departmental adviser, and the Dean of Students, be permitted to drop the course. In such cases, the permanent grade of *E* will be recorded for the student in the course dropped.

b. Students who, due to circumstances beyond their control (sickness, family difficulties, etc.), have not been able to participate fully in the academic exercises of the University during any given semester may be permitted to

drop one or more courses in order to make their work in the remainder of the term of a realistic quantity, if they have the permission of the faculty adviser or departmental counselor and the Dean of Students. In such cases, no penalty shall be assessed.

c. Students who are permitted to withdraw from the University are permitted to drop their courses with or without penalty as seems advisable to the academic adviser and the Dean of Students.

**Junior Year Abroad** Superior students who receive the permission of their departments of concentration and of the Administrative Committee may apply for admission to a foreign university for study abroad in the junior year or for admission to one of the foreign-study programs conducted by an American college or university. Students who study abroad under this plan are retained on the rolls of the University of Rochester and receive full credit for work successfully completed abroad provided the student's registration has been approved in advance by the University. Students interested in the program of study abroad must apply to the Office of the Dean of Students early in the autumn of their sophomore years. A fee of \$50.00 is charged to students who retain their status as Rochester undergraduates while studying abroad.

**Marking System** A student's work in any course will be rated in accordance with the following definitions: Grade A, Excellent; Grades B+ and B, Good; Grades C+ and C, Satisfactory; Grades D+ and D, Poor; Grade E, Failure. The official definitions of these grades as adopted by the faculty may be inspected on application to the Registrar's Office.

Grades in Physical Education are given as Cr-Credit, P-Pass, NC-No Credit, and E-Failure. Two points of credit are given for each hour of credit for a grade of Cr and no points for a grade of P.

**Hours of Credit and Points of Credit** Two units are employed in fixing the total requirements for graduation, the hour of credit and the point of credit. The hour of credit represents a passing grade (D or higher) in a course of one hour a week for one term. For each hour of credit the student will receive four points of credit if his grade is A; three and one-half points of credit if his grade is B+; three points of credit if his grade is B; two and one-half points of credit if his grade is C+; two points of credit if his grade is C; one and one-half points of credit if his grade is D+; or one point of credit if his grade is D.

In laboratory courses at least two hours of attendance in laboratory are required to gain one hour of credit.

**Examinations and Failure** A student whose work during the term has not been satisfactory to the instructor in charge may, at the discretion of the instructor, be excluded from the final examination, and be reported as *failed*.

The instructor's report at the close of the course includes a grade indicating the combined result of term work and examination. Any student who is absent from a regular examination through causes beyond his control may, by special permission of the Dean of Students, be allowed make-up examination to be taken at a time appointed by the instructor.

**Requirements for  
Bachelor's Degree  
with Distinction**

The Bachelor degrees are awarded in three grades of distinction: with *distinction*, with *high distinction*, and with *highest distinction*.

This award is based primarily on a point-hour ratio: at least 3.25 for distinction, 3.60 for high distinction, and 3.85 for highest distinction. However, a piece of creative work or a paper (critical or creative, or a report of the results of original research) may be offered in support of a recommendation for a distinction award not more than one level higher than would be indicated by the point-hour ratio. Students interested in submitting such a project should consult their departmental counsellors not later than February 1 of the year in which they plan to graduate.

Except in unusual cases, no student shall be considered for a degree with distinction who has not had at least two years of academic work at the University of Rochester. Ordinarily nothing higher than a degree *with distinction* will be given in such cases.

**Deficiency in  
Academic Work**

The Committee of Faculty Advisers and Deans periodically reviews the academic records of first and second year students; departmental counsellors review the records of juniors and seniors. Students who do not make satisfactory progress towards the completion of requirements for a degree may be warned, placed on probation, or dropped from college.

It is not the policy of the University to apply rigid numerical criteria in determining when warning, probation, or dismissal action is warranted. However, freshmen whose point-hour ratios are below 1.7 (D plus average) normally are subject to academic action. Sophomores, juniors, and seniors are expected to maintain a cumulative point-hour ratio of 2.0 (C average) or better. An upper-class student may be warned or placed on probation for an exceptionally poor term record, even though his cumulative record is 2.0 or better. All factors relevant to a student's academic progress are considered in making decisions regarding academic action.

A student on probation (1) may not be absent from classes, (2) may hold no class or other office or participate in extracurricular activities, (3) may not represent the University in any public function, and (4) should expect dismissal at the end of the period of probation if his work has not shown marked improvement.

**Withdrawal**

The continuance of each student upon the rolls of the University, the receipt by him of academic grades, his graduation, or the conferring of any degrees or the granting of any certificate, shall be strictly subject to the discretionary powers of the University. The University expressly reserves the right, and each student expressly concedes to the University the right, to require his withdrawal at any time for any reason; no reason for requiring such withdrawal need be given.

If a student withdraws on his own initiative while his academic standing is unsatisfactory, he may be recorded as *dropped*. A student who withdraws early in a college term may be excused from payment of a part of his tuition for that term. After five weeks the student must pay full tuition. Up to that time he pays a percentage of his tuition based on the length of his attendance.

**Firearms** The following regulations apply to the possession and use of firearms:

1. No student may possess a firearm or airgun on the River Campus without registering his weapon in the Office of the Dean of Students within twenty-four hours after it is brought on campus.
2. Weapons registered with the Dean of Students must be deposited with the appropriate dormitory head or fraternity president. If such deposit is inconvenient the student may retain the firearm but deposit a major operating piece of the mechanism such as a bolt or a cylinder with the dormitory adviser or fraternity president.
3. No student may fire a rifle, shotgun, pistol or airgun on the River Campus except in places specifically designated for this purpose, i.e. the rifle range.
4. Students who are found with an unregistered firearm (including an airgun) in their possession or who are apprehended shooting a firearm or airgun on the River Campus or riverbank adjacent thereto are subject to expulsion from this University.

**Master Keys** The unauthorized possession or use of a key to a University lock is forbidden, and students violating this regulation are subject to a fine and/or expulsion.





# *Degree Programs*

OFFERED BY THE COLLEGES  
AND SCHOOLS LOCATED  
ON THE RIVER CAMPUS

THE responsibilities which a complex civilization places upon the citizen of today remind him that narrow fields of specialization prepare him for only a small portion of his life. The best education should prepare him morally, physically, intellectually, and spiritually to live to his fullest capacities. He must know not only himself but also the world about him; he must be trained to make judgments based on a sense of values, not on prejudices and misconceptions. In the study of the liberal arts he learns that science, literature, history, philosophy, the social sciences, and all the other arts can free his mind from the limits of narrow interests. Knowledge of the past enriches his experience and affords wisdom for the future. Education in the humanities helps a student to answer the question, "What am I to live for?"

Mastery of a chosen field of professional competency is often essential to material success, but the demands of every important profession increasingly require broad social vision as well. The best schools of law, medicine, and theology, positions in the world of industry, government, journalism, and many other spheres, call for men and women with understanding, not only in the areas of specialization, but also in subjects which prepare them to accept their wider responsibilities in life.

For these reasons The University of Rochester urges the importance of the liberal studies in both the degrees which it offers, Bachelor of Arts and Bachelor of Science.

## Courses for the Bachelor's Degree

Candidates for the Bachelor's degree will normally complete two years of liberal studies in the College of Arts and Science and the final two years of preparation will be completed in the College of Arts and Science, the College of Engineering, the College of Education, the School of Business Administration, the Department of Nursing, or the Institute of Optics. A summary of the programs offered by the respective colleges and schools located on the River Campus follows:

### *College of Arts and Science*

Arts Course with a major in:  
 Anthropology and Sociology  
 Biology  
 Chemistry  
 Economics  
 English  
 Fine Arts  
 Foreign Languages  
 General Science  
 Geology and Geography

History  
 Mathematics  
 Music  
 Non-Western Civilizations  
 Philosophy  
 Physics  
 Political Science  
 Psychology

### *Degree*

Bachelor of Arts

Program of Honor Studies with a major in:

Economics  
 English  
 Foreign Languages

History  
 Philosophy  
 Political Science

Bachelor of Arts

Course of Study with a major in:

Astrophysics  
 Biology  
 Chemistry

Geology  
 Optics<sup>1</sup>  
 Physics

Bachelor of Science

### *College of Education*

Course of Study with a major in:  
 Elementary Education  
 Secondary Education  
 Nursing Education

Bachelor of Science

### *College of Engineering*

Course of Study with a major in:  
 Chemical Engineering  
 Electrical Engineering  
 Mechanical Engineering

Bachelor of Science

### *School of Business Administration*

Course of Study with a major in:  
 Accounting (C.P.A.)  
 Business Administration  
 Industrial Management<sup>2</sup>

Bachelor of Science

### *School of Medicine and Dentistry*

Course of Study with a major in:  
 Nursing

Bachelor of Science

<sup>1</sup>Work offered by the Institute of Optics; degree awarded by the College of Arts and Science.

<sup>2</sup>Administered by the School of Business Administration in cooperation with the College of Engineering.

## *Graduate Studies*

The University offers opportunities for graduate and professional instruction leading to the degrees Doctor of Philosophy, Doctor of Musical Arts, Doctor of Education, Master of Arts, Master of Science, Master of Education, Master of Business Administration, and Master of Music.

The College of Arts and Science offers graduate work leading to the degree of Doctor of Philosophy in the following departments: Biology, Chemistry, Economics, English, Geology, History, Mathematics, Optics, Philosophy, Physics, and Psychology. The degrees Master of Arts and Master of Science also are given for work in these departments, and in the following departments of the College: Fine Arts, Foreign Languages, and Political Science.

The College of Engineering offers work leading to the Doctor of Philosophy and the Master of Science degrees in Chemical Engineering, and to the Master of Science degree in Electrical and Mechanical Engineering.

The College of Education offers work leading to the degrees Master of Education, Master of Arts in Education and Master of Science in Nursing Education and Doctor of Education.

The School of Business Administration offers work leading to the degrees Master of Science with a major in Business Administration, and Master of Business Administration.

The Eastman School of Music offers work leading to the degrees Doctor of Philosophy, Doctor of Musical Arts, Master of Arts, and Master of Music.

The School of Medicine and Dentistry offers work leading to the degrees Doctor of Medicine, Doctor of Philosophy, and Master of Science. Information on the program for the degree Doctor of Medicine may be obtained from the Dean of the School of Medicine and Dentistry, University of Rochester, Rochester 20, New York.

Detailed information on graduate programs offered on the River Campus, as well as on the programs leading to graduate degrees in the other Schools of the University, is given in the bulletin "Graduate Studies," which may be obtained on request from the Associate Dean for Graduate Studies in each School. Students requesting application forms, bulletins, and additional information should write to the Secretary of Graduate Admissions, Administration Building, University of Rochester, Rochester 20, N.Y.



# Officer Candidate Programs

## *Naval Reserve Officers' Training Corps*

THE University of Rochester is one of fifty-three colleges or universities at which a permanent Naval Reserve Officer's Training Corp Unit has been established. A Department of Naval Science under a Professor of Naval Science and a staff of Naval instructors is an integral part of the College of Arts and Science; a permanent building, Harkness Hall, has been constructed by the University to house the Department.

The Naval Science sequence, consisting of one course per term, complements the University's regular academic courses in arts and science. Those enrolled in the NROTC program may fulfill the requirements for a Baccalaureate degree in either arts or science, as well as the requirements for a commission in the Naval Reserve for a period of such length as to total six years of commissioned service.

There are two types of students enrolled in the NROTC program:

1. *Regular NROTC Students* are subsidized by the Navy for tuition, fees, textbooks, uniforms, and retainer pay of \$600 per year. In return for these benefits, regular NROTC students obligate themselves to attend three cruises or summer training periods of six to eight weeks; to accept a commission as ensign, USN, or second lieutenant, USMC; and to serve for four years on active duty after graduation, with the ultimate option of applying for a permanent commission or of transferring to the Naval Reserve for a period of such length as to total six years of commissioned service.
2. *Contract NROTC Students* agree to make one summer practice cruise of three to six weeks, to accept a commission for two years in the Naval Reserve or for three years in the Marine Corps Reserve, if offered, to serve for two years on active duty, if called, and not to resign such commission before six years from its original date. Contract students may, if granted permission by the Chief of Naval Personnel, delay their reporting for active duty in order to pursue (at their own expense) graduate study in Engineering, Chemistry, Physics, or Mathematics. Delay will not be granted for work beyond the Master's Degree, nor for a period longer than two years. Contract NROTC students are issued a complete uniform and Naval Science textbooks by the government and are paid subsistence allowance during their last two academic years.

Regular NROTC students are selected after nationwide competitive aptitude and screening tests and certified to the University by the Navy Department.



Contract students are selected from applicants from the incoming freshman class, the number being limited to a quota set by the Navy Department.

With the approval of the Professor of Naval Science and the academic authorities, civilian students, citizens of the United States, who have not entered into any contract with the Navy may be permitted to pursue Naval Science courses for college credit. They will be designated as Naval Science students. Since they are not members of the NROTC, either as regular or contract students, they will not be eligible to make NROTC practice cruises, to be issued uniforms, to have access to classified information or to be paid any compensation or benefits. Naval Science students may become eligible for enrollment as Contract NROTC students, provided they comply in every respect with the requirements for such enrollment. They may also participate in the annual competition for entrance into the NROTC as regular students.

The requirements for enrollment in the NROTC program for both regular and contract students are that they: (1) must be unmarried male citizens of the United States and must agree to remain unmarried until commissioned or disenrolled; (2) must be not less than seventeen years of age nor more than twenty-one years of age on July 1 of the year in which they enter college (contract students may be accepted at age sixteen if considered of sufficient maturity by the Professor of Naval Science); (3) must meet all of the entrance requirements of the University, and be granted admission by the University; (4) must agree to remain in college for at least four years; (5) must be physically qualified.

In addition to the requirements for a Baccalaureate degree and those for a commission in the Naval Service, the following must be fulfilled: (1) By the end of the sophomore year, every regular NROTC student must have satis-

factorily completed one year of college physics and one year of college mathematics; Contract students are encouraged but not required to take physics. (2) All Contract students must have completed mathematics through trigonometry by the end of the sophomore year. Contract students who have completed the mathematics requirements in secondary school need not take more mathematics unless it is required by the courses they are pursuing in the University. (3) Every student must achieve proficiency in written and oral expression. The University will prescribe standards of proficiency and determine procedures necessary to achieve them. (4) Physical training will be taken by every student. (5) Each student shall take instruction in swimming as to qualify him as a First Class Swimmer. Both Regular and Contract NROTC students are deferred from the draft while enrolled in the NROTC Unit. Naval Science students are not deferred from the draft by the Navy.

## *Air Force Reserve Officers' Training Corps*

The Air Force Reserve Officers' Training Corps at The University of Rochester is one of 176 such units located at colleges and universities throughout the United States. Its purpose is to prepare selected male college students to qualify for commissions as second lieutenants in the Air Force Reserve at the same time that they graduate from college. The training program is conducted by personnel assigned from the United States Air Force to the University, where they are organized into the Department of Air Science.

The Air Science program is divided into two parts, the basic course (freshman and sophomore years), and the advance course (junior and senior years). The Air



Science courses listed on page 110 must be successfully completed in order to qualify for a commission in the Air Force Reserve upon graduation.

Requirements for enrollment in the basic course (freshman and sophomore years) are that the student: (1) be a citizen of the United States (2) be over fourteen years of age upon entering the course and be less than twenty-eight years of age at the time of completing the program (3) be physically qualified for entrance to the University. Selection for enrollment in the advanced course (junior and senior years) requires that the student: (1) complete the basic course or equivalent thereof (2) meet the physical requirements for general military service in the scientific or administrative categories or for flight training (3) have successfully completed such general survey or screening tests prescribed for entering into each of the categories (4) must possess the overall academic average of "C" (2.0).

Accepted students are eligible for draft deferments after completing the first semester of the freshman year.

Basic students are issued a uniform from the University's stock, while advanced students receive a complete Air Force Officers uniform which becomes theirs upon graduation. Including summer training session, advanced students are paid about \$600.00 for their two years' training. One summer training period of four weeks duration is required between the junior and senior years which consists of practical exercises in Survival Training, Air Base Defense, Aircraft and Aircrew Indoctrination and Junior Officer duties. The Summer Training Units are held at several different United States Air Force bases.



### *Platoon Leaders' Class U.S. Marine Corps*

Qualified undergraduates may enroll in this course, which consists of two summer training periods of six weeks each. There is no military training during the academic year. Undergraduates who are enrolled in this program are draft deferred. Applications or requests for further information may be submitted to the Marine Officer instructor in the Department of Naval Science.





## Course Leading to Bachelor of Arts Degree

THE ARTS COURSE leading to the degree Bachelor of Arts offers the student the opportunity to formulate an educational program best fitted to his own needs, interests, and abilities. This will include, usually during the first two years, a general introduction to the main branches of knowledge: literature and the arts, the social sciences, and the biological and physical sciences. During the last two years the student will pursue more intensive study in some chosen field of special interest to him. Programs of concentration in the Arts Course are as follows:

Anthropology and Sociology	History
Biology	Mathematics
Chemistry	Music
Economics	Non-Western Civilizations
English	Philosophy
Fine Arts	Physics
Foreign Languages	Political Science
General Science	Psychology
Geology and Geography	

The Arts Course, because of its flexibility, enables the student to secure a liberal education in the fullest sense of the term.

The requirement for the degree Bachelor of Arts is not less than 124 hours of approved credit (see page 69 for definition of hours and points) and a minimum cumulative point-hour ratio of 2.0. An arts student normally takes five courses in addition to the physical education prescribed for the freshman and sophomore years. Normal progress toward the degree implies a program of fifteen hours each term excluding physical education. Programs involving either fewer or more than five courses will require special permission of the Dean of Students. In general, no arts student is permitted to take more than eighteen hours a term.

It is the expectation in the Arts Course that each student will plan for himself, with the assistance of his advisers, the program best suited to his needs and interests.

Physical Education and English 101, 102 are prescribed for all freshmen. Upon the recommendation of the Department of English, students who show unusual proficiency in English on the basis of the secondary school record and the freshman entrance tests may be excused from English 101, 102.

Beginning with the class of 1963 every student must successfully complete the equivalent of at least the first two years of college instruction in a foreign language or pass a language proficiency examination. Entering students with three or more years of a single foreign language in High School or its equivalent in foreign language background normally take the proficiency examination during Freshman Week; others take foreign language courses at the appropriate levels no later than the junior year.

In addition each student begins in his freshman year to meet the requirements of distribution but is not expected to complete them until later in his course.

REQUIREMENTS OF DISTRIBUTION. The fields of instruction in which work is offered through the College are divided into three groups as follows:

GROUP I  
*Literature and Other Arts*

English  
Fine Arts  
Foreign Languages  
Music

GROUP II  
*Social Sciences*

Anthropology  
and Sociology  
Economics  
Geography  
History  
Philosophy  
Political Science  
Religion

GROUP III  
*Natural Sciences*

Astronomy  
Bacteriology  
Biology  
Chemistry  
Geology  
Mathematics  
Naval Science  
Optics  
Physics  
Psychology<sup>1</sup>

To meet the requirements of distribution, all students must take in addition to Physical Education and English 101, 102 two full-year courses or their equivalent in each of the two groups other than that in which their field of concentration or their major lies. One of the two courses chosen to fulfil the distribution requirements in each of the two groups with which the student is concerned must be selected from the following list:

IN GROUP I

English 103, 104 or  
131, 132  
<sup>2</sup>French 131, 132  
<sup>2</sup>German 131, 132  
<sup>2</sup>Spanish 131, 132

IN GROUP II

Economics 101-102  
Political Science 101, 102  
History 101, 102  
Philosophy 101, 102  
Anthropology and  
Sociology 101-102

IN GROUP III

Biology 101-102  
Chemistry 111, 112 or  
121, 122 or  
123, 124  
Geology 101-102  
Physics 101-102  
Physics 107-108

The second course in each group required for distribution may be any course in the group without restriction other than that prescribed by the departments themselves.<sup>3</sup>

**Requirement  
for a Field of  
Concentration**

In the sophomore year at the time of program approval each student shall consult with his advisers and submit to them for approval a tentative *plan of study* for the junior and senior years. This general plan will be the basis for preparing a specific program of courses to be taken. For students whose aims and interests are not yet clear, the program for the junior and senior years may be left in a tentative general form subject to more specific formulation by the spring of the sophomore year.

The preparation of this plan of study will be carried out in cooperation with the advisers and must be approved by them and by the Dean of Students. To be approved the student's program must meet the following regulations:

<sup>1</sup>The courses offered by the Department of Psychology fall within both Group III and Group II. Those classified as Group III, the Biological Sciences, are: Psychology 101-102, 201-202, 203, 205, 209, 297, 293. Those classified as Group II, the Social Sciences, are: Psychology 242, 247, 207, 210, 211, 213, and 214.

<sup>2</sup>Students entering college with sufficient training in French, German, or Spanish to admit them to literature courses more advanced than French 131, 132, German 131, 132, or Spanish 131, 132 may count such courses as meeting the distribution requirements.

<sup>3</sup>English 113 may not be counted as satisfying the Group I distribution requirement unless prior approval is obtained from the Chairman of the English Department. Non-Western Civilizations 201-202 may be counted either as a Group I or II course.

A. It must include a total of 124 semester hours of work, including physical education in the first two years, and meet the requirements for English composition and foreign language as well as the requirements of distribution in the various groups as stated in the previous section.

B. It must include a group of approximately six year-courses in the main field or fields of interest which are sufficiently unified and sufficiently advanced so that, in the judgment of the heads of the departments concerned, the work covered may be made the basis of a senior comprehensive examination. Of the six courses to be taken in the field of concentration during the junior and senior years, not more than five nor less than three may be in the principal department, without special permission of the Dean of Students and the chairman of the department concerned. No introductory course from the principal department of concentration may be included in a concentration program. In general, introductory courses in an allied department shall not be included in the concentration program, but one such course may be taken with the consent of the department adviser and the Faculty Adviser; inclusion of two such courses must be approved by the Dean of Students.

C. The plan of study shall include courses outside the field of concentration which will contribute breadth to the whole program.

D. Every candidate for the Bachelor of Arts degree is required to demonstrate a comprehensive grasp of the subject matter of his field of concentration. In some departments this is done chiefly by means of comprehensive examinations, which are described below; in others by an approved substitute for the comprehensives which the student must perform during his junior and senior years. The student is recommended for the degree by the department of concentration on the basis of satisfactory completion of all requirements. The comprehensive examinations or the approved substitute constitute one element in the total program of the student. Whichever test of comprehensive knowledge is used could be overbalanced by other elements in the student's record in determining whether the student is to be recommended for the degree.

The requirement that the student shall demonstrate a comprehensive knowledge of his field of concentration is applicable to all candidates for the Bachelor of Arts degree, whether this knowledge is tested by the comprehensive examinations or by an approved substitute.<sup>1</sup> The principles which guide the departments in recommending their concentrating students for the degree are as follows:

The accepted goal for students who are candidates for the Bachelor of Arts degree is a comprehensive grasp of the subject matter represented by the field of concentration. In addition, therefore, to earning at least 124 hours in approved courses with a minimum cumulative point-hour ratio of 2.0 and satisfying the requirements of distribution and concentration, the student must demonstrate on a comprehensive examination or such substitute as is approved by the Committee on Academic Policy, that he or she has met that goal and may be recommended for the award of the degree.

<sup>1</sup>Candidates for the Bachelor of Arts degree with a concentration in music, and premedical students admitted to an approved medical school at the end of the junior year are not required to take comprehensive examinations or to complete an approved substitute therefor. Comprehensive examinations are not normally required for the Bachelor of Science degree, but divisions or departments concerned with this degree may require comprehensive examinations of students graduating in their fields if they regard such examinations as feasible and educationally desirable.

It rests with the individual department to evaluate the student's performance on the comprehensive examination or approved substitute as a part of his or her total record and to recommend on that basis whether or not the student may be graduated and the level of distinction earned, if any.

Passing the comprehensive examination or approved substitute is evidence that the student has a sufficiently comprehensive grasp of the subject matter of his field of concentration to qualify for the degree of Bachelor of Arts.

**The Comprehensive Examination.** Since the term *comprehensive* is construed to mean more than merely *inclusive*, these examinations will do more than test the student's knowledge of work covered in his courses of concentration. They will be so designed as to evoke a demonstration of his intellectual maturity, of his ability to correlate material derived from different courses, to evaluate the relative importance of the facts and principles presented in different courses on the basis of his wider knowledge of the general field, and to appreciate the significance and permanent value of the material of his field of concentration. Course work should therefore give a student practice in judging as well as in acquiring information.

**Administration of the Comprehensive Examination.** There shall be not less than three nor more than four three-hour examinations, given normally at the end of the senior year. In other respects, departments using the comprehensives are free to determine the kind of examinations most suitable to their field.

The three or four examination sessions which compose the comprehensive examination shall be given at the rate of not more than one a day and shall normally be three-hour written examinations. Only one of the written examinations may be replaced by an oral examination. Comprehensive examinations cover only courses included in the program of concentration. All questions, including those on allied fields, are to be made up and graded by members of the principal department of concentration.

A candidate for the degree with distinction may expect a more searching comprehensive examination than that for the ordinary degree, and an oral examination may also be included if the department so desires.

Seniors taking the final comprehensive examination shall be excused from all final course examinations in the term in which the comprehensive is taken. Their term grades shall be determined by the average of such things as previous hour-examinations, quizzes, papers, and laboratory work; in the department of concentration, the instructor may also take into consideration the rating obtained on the comprehensive examination or pertinent portions thereof.

If desired by the instructor, hour examinations may be given at any time prior to the last week of classes. Instructors may give hour examinations during the last week of classes but seniors taking comprehensive examinations are not expected to take these examinations.

The comprehensive examinations shall be given on or after the fourth day of the regular examination period in order to give at least a one-week reading period.

Students shall be informed of the departmental requirements for the comprehensive examinations as early as possible, certainly not later than the beginning of their junior year.

*The Approved Substitutes for the Comprehensive Examination.* The substitutes for the comprehensive examination by which certain of the departments test the student's knowledge of his field of concentration are approved by the Committee on Academic Policy.<sup>1</sup> A subcommittee of the Committee on Academic Policy is concerned with the supervision and evaluation of the operation of substitutes for the comprehensive examination.

Seniors concentrating in departments which use an approved substitute for the comprehensive examination will normally take the final examination in all of their courses.

*Failure to Demonstrate Comprehensive Knowledge.* The failure of a student to demonstrate by the comprehensive examination or by the approved substitute procedure of his department that he possesses comprehensive knowledge of his field of concentration does not prevent his department from recommending him for the degree if he has met all of the other requirements. As stated above, the department of concentration may recommend such a student if, in the opinion of the department, other elements of his total program counterbalance this deficiency. If the department concerned does not recommend such a student for the degree, he shall not graduate with his class.

If the department is one which uses the comprehensive examination, the student may take the examinations again in the following autumn in order to qualify for the degree. If, however, in the opinion of the department concerned, it is not feasible for him to take them again at that time, or if he fails the comprehensive examination a second time, he shall have the privilege, by arrangement with his department of concentration, of completing a project in a part of the field of concentration in which he has failed to show adequate knowledge or understanding, and one which he may correlate with other parts of his field of concentration. The project must be under the direction of and approved by the department concerned and should be of such a nature as to permit its completion by September 1 following the June in which the degree would have been awarded; in no event may the time for its completion be extended beyond May 15 of the ensuing academic year. A recommendation for or against granting the degree shall then be made by the department to the Administrative Committee. A fee of \$10.00 will be charged for each re-examination.

In the event that a department which uses an approved substitute for the comprehensive examination does not feel at the end of the student's degree program that it can certify that the student has the desired comprehensive knowledge, the department shall specify what additional work shall be required of the student at some later date as evidence that he has acquired the required comprehension. On the completion of such work, the department shall recommend to the Administrative Committee for or against granting the degree.

<sup>1</sup>The following departments use approved substitutes for the comprehensive examinations: Biology, Chemistry, Economics, General Science, Geology, Mathematics, Non-Western Civilizations, and Psychology.

## THE CONCENTRATION IN GENERAL SCIENCE

For a concentration in General Science, nine year-courses or their equivalent must be taken in the departments of biology, chemistry, geology, mathematics, physics or psychology. (Only the following Group III courses in psychology may be included in this concentration: Psychology 101-102, 201-202, 203, 205, 209, 211, 297, 220, 293. Chemistry 101 and 102 may not be included in this concentration.) Of these nine courses at least four shall be elementary, at least four shall be advanced courses, and at least one of these advanced courses shall be a third-year course. For example, a General Science program may consist of a three-year sequence in one department, two-year sequences in two departments, and single courses in two departments. In addition to this 3:2:2:1:1 sequence, the General Science committee will approve a 3:3:2:1, 3:3:1:1:1, 3:2:2:2, 4:3:1:1, or 4:2:1:1:1 sequence of courses. Term courses in separate fields or departments may not be used toward the concentration. Philosophy 252 (Philosophy of Science) must be taken, without academic credit, during the second term of the senior year as the approved substitute for the comprehensive examination.

The concentration program should be worked out by the student together with Mrs. Nowlis, the General Science Counselor. The committee in charge of the concentration in General Science: Messrs. Muchmore (chairman), Childs, Gunderson, Nowlis, Sutton and Wiig.

## THE CONCENTRATION IN NON-WESTERN CIVILIZATIONS

The concentration in Non-Western Civilizations gives the student a broad understanding of the history, cultures, philosophies and contemporary political, economic and social problems of the Middle East, Asia, Africa and Latin America, and of the relations, past and present, of these areas with the Western nations. Participation in this program requires knowledge of the development of the Western world as background for evaluating the impact of the West on Non-Western Civilizations. Careful selection of electives may also provide the student with the equivalent of concentration in a particular subject. The concentrator in Non-Western Civilizations receives aid, through seminars and other means, in correlating what he learns.

*Requirements for Concentration.* A student who plans to concentrate in Non-Western Civilizations should, if possible, take the introductory course, Non-Western Civilizations 201-202. The student would then be expected to take the following courses listed under Category I: (1) courses covering four non-Western areas (choosing Russia, China, Japan, the Middle East, Latin America, Africa or India); (2) one course in government (choosing The British Commonwealth of Nations or Government and Politics in Contemporary Africa); (3) one course in economics; (4) one course in geography; and (5) a course in anthropology, history of religions or comparative non-Western humanities. The student taking honors can enlarge the range of work by selecting courses from Category II, and in Category III has a choice of four to six honors seminars, among them Political Science 350, History 361, 362 and 367, and Economics 325.

*Category I* (Courses dealing with non-Western areas)

<b>History:</b>	261	China Since 1800
	262	Japan Since 1800
	265, 266	A History of Russia to the Present Time
	267	The Middle East in Modern Times
<b>Political Science:</b>	253	Contemporary India
	260	Government and Politics in Contemporary Africa
<b>Economics:</b>	225	Economic Development
	249	Comparative Economic Development
<b>Geography:</b>	252	Geography of South America
	260	Geography of Asia
<b>Anthropology and Sociology</b>	210	Culture Contact and Social Change
	230	Social Anthropology of South Asia
	240	Culture Areas of Negro (Sub-Saharan) Africa
	270	Comparative Political and Legal Systems
<b>Religion:</b>	103	History of Religions
<b>Literature:</b>	285, 286	European Literature in Translation
<b>Non-Western Humanities:</b>	203	Oriental Civilizations

*Category II* (Related Courses)

<b>History:</b>	222	British History
	281	World Communism
<b>Political Science:</b>	251, 252	International Politics
<b>Economics:</b>	249	Comparative Economics Systems
	269	International Economic Relations
<b>Science: Chem.</b>	261	Science in National and International Affairs
<b>Anthropology and Sociology:</b>	201-202	The Culture History of Man
	205	The Social Institutions of Modern Industrial Society
	206	Departmental Seminar for Senior Anthropology-Sociology Concentrators
	210	Culture Contact and Social Change
	220	Culture and Personality
	260	Peasant Society and Culture
	280	Social Organization and Bureaucracy in Modern Industrial Society

*Category III* (Honors Seminars)

<b>Political Science:</b>	250	India
<b>History:</b>	362	Southeast Asia
	367	Middle East
	361	Japan and China
<b>Economics:</b>	325	Economic Development

The committee in charge of the concentration in Non-Western Civilizations: Professor DEAN (Political Science), Chairman; Professor HAROOTUNIAN (History), Coordinator; Professor CANFIELD (Foreign Languages); Professor CHRISTOPHER (History); Professor COHN (Anthropology, Southeast Asia); Professor DIEZ (Political Science); Professor DOHANIAN (Fine Arts); Professor HALL (Geography); Professor ECKSTEIN (Economics); DEAN HAZLETT, represented by Professor HOFFMEISTER (Geology); Professor SANGREE (Anthropology, Africa); Professor VAN DEUSEN (History).

# The Honors Program

**PURPOSE AND NATURE OF HONORS WORK.** The Honors Program provides an unusual opportunity for capable juniors and seniors who wish to work independently and to receive a large amount of individual instruction. The seminars of the Honors Program offer students frequent and extensive participation in discussion by small groups as well as directed training in the techniques of analysis, criticism, and research. Honors work furnishes a useful background for post-graduate study in many fields. The Program, however, by no means aims exclusively at specialized training. It provides a general education by increasing the student's knowledge both in depth and in breadth, and it supplies valuable experience in the arts of writing and of evaluating ideas.

Honors students in their junior and senior years normally take two seminars each term instead of four or five regular courses. Each seminar carries eight hours of credit and is normally limited to an enrollment of eight students. Each meets once a week for approximately three hours, usually in the afternoon, and in an informal atmosphere designed to promote the ready interchange of ideas. The work in each seminar generally centers on the presentation and discussion of written papers and oral reports.

**EXAMINATION AND GRADES.** Quizzes and hour examinations are not held in seminars. At the end of the junior year Honors students take a three-hour written examination in the work of each seminar in which they have been enrolled during the year. At the end of the senior year they take both written examinations and brief oral examinations in the work of the seminars of that year. Honors seniors also take a comprehensive examination (usually written, for three hours) covering the field of concentration, and set and graded by the department of concentration. The written seminar examinations are set and graded, and the senior orals administered, by a Board of Outside Examiners ordinarily drawn from the faculties of other universities and colleges. In no case will they have taken part in the instruction of the students they examine. As a basis for the examinations the examiners receive information about the work in the seminars from the instructors. After the examiners evaluate the examinations the instructors have the privilege of communicating to the examiners any serious dissatisfaction with the rating of any student. The final decision rests with the examiner, unless the Executive Committee of the Honors Program unanimously disagrees.

For each seminar a student receives one of the following grades:

Highest Honors

High Honors

Honors

Pass (credit, but not toward the degree with Honors)

Fail (no credit)

The final ranking of seniors—Honors, High Honors, etc.—is made by the Committee of Examiners who examine them orally in the seminars of their senior year. This oral examination is intended solely to give the student a chance to improve his standing. In this final ranking, the Committee of Examiners may draw upon the counsel of the instructors and the Honors Committee.

OFFERINGS AND CONCENTRATION. Honors seminars are offered in the following fields:

Comparative Literature	Foreign Languages	History
Economics	Political Science	Philosophy
English		

An Honors student may offer any one of these as his field of concentration, with the exception of Comparative Literature. Normally a student chooses four of the eight seminars during the junior and senior years in his field of concentration.

PLANNING AN HONORS PROGRAM. A good deal of flexibility is possible in the planning of an Honors program. The Honors Committee may permit students to take an Honors degree with fewer than eight seminars. Students preparing to be teachers, for instance, may take the necessary courses in Education along with a somewhat reduced number of seminars. Premedical students can arrange schedules allowing them to complete their science courses and begin Honors work at the same time. Honors students may be able to take a regular course or two in fields not offering seminars, in order to round out their education. In regular courses Honors students take the usual quizzes and examinations and receive a letter grade.

Honors students who wish to withdraw from the program and resume regular course work may do so at the close of either term during the junior year or of the first term of the senior year. Conversely, the student wishing to enter the program at the beginning of the second term of the junior year may usually do so. Enrollment in seminars is not restricted to students formally enrolled in the Honors program. Seminars which do not have their full complement of eight generally admit both qualified juniors and seniors majoring in regular course work and qualified graduate students.

Students planning to enter the Honors Program are generally expected to have demonstrated their capacity for successful individual work by obtaining an average of B or higher in their regular courses. Each application for admission to the program, however, is considered by the Committee on its own merits. Freshmen and sophomores planning to go into Honors work should aim to meet the requirements for group distribution by the end of the sophomore year. They are urged to take general survey courses which will furnish a useful background for seminars in the fields of their choice. Examples are: English 111, 112 or 103, 104, French 131, 132, German 131, 132, Political Science 101, 102, History 101-102 and 231, 232, Philosophy 103, 104.

The Director of the Honors Program is Mr. Robert France. The Executive Committee for the year 1960-61 includes: Messrs. Beck, Hill, Wiltsey, Christopher and Gollin.

The Director and the members of the Executive Committee welcome inquiries concerning the Honors Program. Interested students should also consult their Faculty Advisers.

## Courses Leading to Bachelor of Science Degree

Four-year courses of study are offered leading to the degree Bachelor of Science: Astrophysics, Biology, Chemistry, Geology, Optics, and Physics. The course requirements for the degree are indicated in the synopses on the following pages. In addition, students must earn a point-hour ratio of 2.0. In each course English 101, 102 is prescribed in the freshman year, physical education is prescribed for the first two years and it is expected that two years of foreign language or the equivalent will have been completed during the first two years.

The distribution requirements for the Science Courses are the same as for the Arts Courses. These are outlined in detail on page 83. In some cases the courses counted for distribution are prescribed and appear in the synopses on the following pages; in others elective courses are chosen to meet the requirements.

**REGISTRATION FOR STUDIES.** The registration for studies in each year should be approved by the chairman of the department before being presented for the approval of the Faculty Adviser.





## Preparation for Advanced and Professional Study

**T**HE College of Arts and Science believes that the maximum of liberal studies possible is the best foundation on which to build a thorough specialized training. The curriculum is so arranged, therefore, that the student has a wide choice of courses designed to help him gain the broad knowledge and discipline indispensable to a full professional life, as well as of courses which will furnish the necessary basis for technical professional study.

Students who intend to enter graduate or professional schools should consult with their Faculty Advisers, departmental advisers, and vocational counselors as early as possible in their undergraduate courses to plan programs of study that will provide the best preparation for advanced and professional training in their chosen fields.

**MEDICINE.** Students who are planning a professional career in medicine should realize clearly what is required—a broadly educated person with an adequate grounding in science. Since the accomplishment of this objective is somewhat involved, the opportunities offered to the student are presented in considerable detail. Two plans of study are open:

(1) Premedical students may pursue a program leading to the Bachelor of Arts degree. A concentration in any department of study is acceptable, provided that the requirements for admission to medical school are fulfilled. This plan satisfies the entrance requirement of a college degree set by a few medical schools, and gives to the student the opportunity for concentration in a particular field of learning.

Premedical students may study for the degree in the Honors Program.

(2) Capable and mature students are admitted to some medical schools after three years of college work. The University of Rochester will accept the first year courses in an approved medical school, as equivalent to the work of the fourth year in college, provided that:

- (a) distribution requirements have been met.
- (b) at least 94 credit hours have been completed and at least 248 points of credit have been earned before entrance to medical school.
- (c) the first year of medical school has been completed satisfactorily.

The Bachelor of Arts degree will be granted to a student meeting these requirements upon application by the student.

Premedical students should understand that completion of three years of college study and a meeting of stated requirements does not insure their admission to a medical school. The program of study should be so planned, therefore, that it may be adapted after the three years to the College's requirements for concentration in some department of study.

Although medical schools vary somewhat in their admission requirements, the following courses represent the minimum commonly required for a premedical program:

Biology 101-102, and an additional year in this field.

Chemistry 121, 122 (or 123, 124), 142, 161-162.

Physics 101-102.

Mathematics, one year.

English 101-102, and a year in literature.

Modern foreign language, two years.

The catalogues of particular medical schools should be consulted for their specific requirements for admission. (also see "Admission Requirements of American Medical Colleges" by the Association of American Medical Colleges.) Student should be careful to meet the entrance requirements of the medical schools to which they may apply.

The special premedical synopses should be followed in the registration of students in the ROTC and those whose high school records indicate that they should not undertake two laboratory courses in the freshman year.

It is recommended that the more able students, particularly those planning to qualify for admission to a medical school at the end of the junior year, adhere so far as possible to the following sequence in taking the science courses listed:

FRESHMAN YEAR	SOPHOMORE YEAR	JUNIOR YEAR
Chemistry 121, 122 (or 123, 124)	Biology 101-102 Chemistry 161-162	Biology 125 Chemistry 142
Mathematics 100, 101 (or 105) Physics 101-102		

It is imperative that students residing in New York State and planning to compete for the Regents Scholarships for Medicine and Dentistry should have

completed their study of organic chemistry (Chemistry 161-162) by the end of the third year of college.

It will be difficult, and in some cases impossible, to fulfill these and the requirements listed under (2) above unless the student notifies the College of his intention before the beginning of the freshman year.

The student's interest may make it desirable to include further training in natural sciences and mathematics than that provided by the courses indicated. This should not, however, be done to the exclusion of courses in social sciences and the humanities. It is not wise to anticipate medical school courses.

The Premedical Advisory Committee assists students in the preparation of their programs of study and aids them in application for admission to medical schools. The members of this committee are: Mr. Muchmore, Chairman; Miss French; Messrs. Andreas, Kaufmann, Sutton and White.

**DENTISTRY.** The recommendations given above for premedical study apply also for the pre-dental student, except that some dental schools admit students upon the completion of two years of college work and the course requirements are somewhat less stringent.<sup>1</sup> The Premedical Advisory Committee also advises pre-dental students in the arrangement of their programs of study and in their applications for admission to dental schools.

**NURSING.** An outline of courses normally taken in preparation for the nursing profession is given on pages 251-252.

**TEACHING.** Suggestions for students planning to enter the teaching profession will be found on pages 198-206 of this catalogue.

**LAW.** There is no one field in which a student preparing for the study of law is advised to concentrate. Mr. Wiltsey, Chairman of the Pre-Legal Advisory Committee, will be glad to consult with students preparing for entrance to law school.<sup>2</sup>

<sup>1</sup>See catalogues of particular dental schools for their specific requirements for admission.

<sup>2</sup>See catalogues of particular law schools for their specific requirements for admission.

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304 Morey Hall

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302 Morey Hall

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Clinical Associate in Psychology
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414 Bausch and Lomb Building  
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Professor of Optics

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Senior Research Associate of Optics

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Research Associate and †Assistant Professor  
of Optics

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Research Associate in Optics

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Research Associate in Optics

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Lecturer in Optics

†William P. Ewald, B.S.  
Lecturer in Optics

†Fred Perrin, PH.D. (Rochester)  
Lecturer in Optics

†Fordyce Tuttle, M.A. (Wisconsin)  
Lecturer in Optics

# *Courses of Instruction*

## EXPLANATION OF COURSE NUMBERING SYSTEM

1-99	Non-credit courses.
100-199	Introductory courses—usually at the freshman and sophomore level—no graduate credit.
200-289	Courses at the junior and senior level carrying graduate credit unless otherwise specified.
290-299	Undergraduate reading or research courses.
300-399	Courses in the Honors Division.
400-489	Graduate courses at the master's level or the first-year of graduate study. Open to undergraduates only by special arrangement.
490-499	Master's level, reading or research courses.
500-589	Advanced or specialized graduate courses, usually at the doctoral level.
590-599	Ph.D. reading or research courses.

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## HONORS SEMINAR

(All Honors courses have eight hours credit.)

### COMPARATIVE LITERATURE

301. *Contemporary Literature.* A study of some of the more important European novelists of the twentieth century: Kafka, Gide, Proust, D. H. Lawrence, Thomas Mann, Koestler, Sartre, Malraux, Camus, Joyce.

Omitted 1960-61.

310. *Modern European Drama.* Leading European dramatists since 1870: Ibsen, Hauptmann, Strindberg, Chekhov, Gorki,

Molnar, Toller, Pirandello, Lenormand, Lorca, Shaw.

Fall term.  
Mr. Ashley

320. *Modern European Novel.* Masterpieces of the European novel in the nineteenth century: Balzac, Stendhal, Flaubert, Zola, E. Brontë, Butler, James, Turgenev, Tolstoy, Dostoevsky.

Omitted 1960-61.

### ECONOMICS

Students majoring in Economics are required to take course work in Economics 207, 209, and 231 as a substitute for one Honors Seminar. Normally, Economics 207 and 231 will be taken in the fall semester of the junior year along with an Honors Seminar. In the spring semester of the junior year, Economics 209 will be taken in addition to two Honors Seminars.

*Prerequisite:* Economics 101-102.

307. *Economic Theory.* A study of the theories of value, production and distribution, with emphasis on modern work in these areas. An analysis of market structures. An

introduction to general equilibrium theory and Keynesian modern income analysis. Economics majors should include this course in their Junior year program.

Omitted 1960-61.  
Mr. Jones

323. *Labor Economics.* A study of labor in a modern, industrial economy. Emphasis is placed on economic analysis of such problems as wages, labor productivity, employment and unemployment. Attention is also given to the history and growth of trade unions and to their relations with the government.

Spring term.  
Mr. France

325. *Economic Development.* Selected problems in the theory and strategy of economic development will be intensively explored with particular emphasis upon criteria for investment allocation, the concept of balanced growth, the theoretical and empirical aspects of underemployment, and agrarian reform and its economic effects. The seminar will be oriented towards discussion based on assigned readings, papers by each member and by visiting lecturers.

Fall term.  
Mr. Eckstein

363. *Public Finance and Fiscal Policy.* The subject matter in this seminar will include governmental expenditures, taxation and debt at the federal, state and local levels. Administrative, historical and theoretical as-

pects will be investigated. A major emphasis will be the economic effects of fiscal policies. American institutions will provide the main illustrative examples, but student papers may be based on experience in other countries.

Omitted 1960-61.  
Professor Jones

367. *Economic Fluctuations.* Economic instability will be studied in its long- and short-run manifestations. The role of business, government and the banking system as causes will be investigated as well as the stabilization policies which each of these sectors of the economy might follow. Theory and history will be emphasized.

Omitted 1960-61.  
Mr. Dunkman

369. *International Economics.* The theory of international trade and balance of payments problems. Commercial policy is examined in its effects on the export-import pattern, the distribution of income, and the gains from trade. A discussion of postwar monetary institutions and the problems they are designed to solve.

Spring term.  
Mr. Tsiang

## ENGLISH

It is expected that English majors will have taken English 111, 112 or English 103, 104 before beginning seminar work. They are required to take English 104 and at least one seminar covering material from the periods before 1800.

301. *Chaucer.* A study of the chief literary works, with emphasis on *The Canterbury Tales* and *Troilus and Criseyde*.

Fall term.  
Mr. Hinman

304. *Shakespeare.* A study of the complete works of Shakespeare.

Each term.  
Mr. Kaufmann, Mr. Hunter

307. *Renaissance Literature.* A consideration of the main themes of Renaissance Literature as expressed by the leading writers of the age in poetry and prose.

Fall term.  
Mr. Frank

310. *Milton.* A study of the works of Milton.  
Omitted 1960-61.

313. *Eighteenth Century Literature.* A study of the poetry and prose from the Restoration to the death of Johnson with special

emphasis on the literary and social criticism of the Neo-classical movement.

Spring term.  
Mr. Schilling

316. *Romantic Poetry.* A study of the major writers.

Omitted 1960-61.

319. *Victorian Poetry.* Poetry and prose of the Victorian period.

Fall term.  
Mr. Gollin

322. *Modern Poetry.* The theories and techniques of modern British and American poets.

Omitted 1960-61.

325. *American Literature to the Civil War.* A study of authors who have made important contributions to American thought with emphasis on Emerson, Hawthorne, Melville, and Whitman.

Omitted 1960-61.

328. *American Literature from the Civil War to the Present.* Major works of the chief American writers of the modern period. Novel: Mark Twain to Thomas Wolfe; poetry: Emily Dickinson to T. S. Eliot; drama: O'Neill to Arthur Miller.

Omitted 1960-61.

331. *The English Drama.* A study of the drama both as a social force and as an

artistic form, using representative plays from classical, Renaissance and modern literatures.

Omitted 1960-61.

336. *The English Novel.* The development of English prose fiction from Defoe to the present.

Each term.

Mr. Johnson, Mr. Ford

## FOREIGN LANGUAGES

Honors Seminars in French and German will be conducted in English. However, students enrolling in French or German Seminars should have a reading knowledge of the language involved.

301. *French Thought.* The Renaissance: Montaigne. Seventeenth century rationalism: Descartes; mysticism: Pascal. The Idea of Progress: Montesquieu, Voltaire, Rousseau. Scientific positivism vs. intuition in the nineteenth century: Comte, Taine, Bergson, Sartre. Knowledge of French not required.

Spring term.

Mr. Harvey

311. *The Age of Goethe.* A study of the work of Goethe and important contemporaries traditionally associated with him under the designation of German classicism. Knowledge of German not required.

Spring term.

Mr. Clark

321. *French Drama from the Renaissance to the Revolution.* Masters of classical drama: Corneille, Racine, Molière. Social and psychological comedy in the eighteenth century: Lesage, Marivaux. Political satire: Beaumarchais. Voltaire and tragedy.

Omitted 1960-61.

332. *Leading Contemporary French Novelists.* The psychological novel: Proust, Gide, Mauriac, Lacretelle, Alain-Fournier, Duhamel. The social novel: Malraux, Jules Romains, Aragon, Martin du Gard.

Omitted 1960-61.

Miss Hill

341. *Modern French Drama and Poetry.* Romantic drama: Hugo, Vigny, Musset. Realism: Augier, Dumas fils, Brieux. Psychological drama: Cœuret, Sarment, Lenormand. Lyric poetry: Hugo, Baudelaire, Verlaine, Verhaeren.

Omitted 1960-61.

351. *Modern German Thought and Literature.* An examination of the contributions of representative authors from 1880 to the present. No German required.

Omitted 1960-61.

Mr. Braun

## HISTORY

Students taking Seminars in American History must have completed History 231, 232; those taking Seminars in European History must have completed History 101, 102.

322. *The British Empire and Commonwealth.* A historical study of the British Empire and Commonwealth with attention given to both Western and non-Western peoples and with particular emphasis on the incentives, problems, expedients, political forms, and ideals within the Empire-Commonwealth since the American Revolution. Some previous knowledge of the political and social history of Britain since the Revolution of 1688 will be expected.

Omitted 1960-61.

Mr. Coates

327. *Seventeenth Century.* A study of seventeenth century history, primarily in England, dealing with the political, economic, social, intellectual, and religious aspects of the period.

Spring term.

Mr. Coates

328. *Canada-United States Relations.* This seminar will deal with problems in the relations of Canada and the United States from 1763 to the present and will afford students an opportunity to study the analogies and

differences in developments in Canada and the United States or Canada and other members of the British Commonwealth. The approach will be largely in terms of history and literature. Previous knowledge of British Commonwealth or American History will be expected.

Spring term.  
Mr. Mason Wade

333. *American Economic History*. This seminar will discuss the economic evolution of the United States from the simple agrarian nation of 1789 to the complex industrial society of today. Topical questions to be treated are: the development of American agriculture; the growth of business organization; and the role of government in economic change.

Omitted 1960-61.  
Mr. VanDeusen

335. *American Diplomatic History*. This seminar will deal with the problems of American foreign policy from the American Revolution to the present day. Special attention will be paid to the Monroe Doctrine, American imperialism, and American policy in the World Wars.

Omitted 1960-61.

340. *The Social History of American Thought*. This seminar will deal with the development of American thought from 1865 to the present day. Special attention will be given

to the social background of intellectual currents.

Fall term.  
Mr. Richard Wade

345. *The Renaissance*. A study of Western Europe from about 1300 to 1527, with equal emphasis upon Italy and the North.

Omitted 1960-61.

351. *Eighteenth and Early Nineteenth Centuries*. A comprehensive study of European history, 1715-1815. Particular stress is placed on the shifting balance of power, the evolution of arts and letters, the Enlightenment, and the era of the French Revolution and Napoleon.

Fall term.  
Mr. Christopher

356. *European Diplomacy since 1919*. A study of the diplomatic history of Europe and the wider world from the Paris Peace Conference to the present.

Spring term.  
Mr. May

361. *The Modern History of China and Japan*. Comparative studies in the social, political and ideological development of China and Japan, with especial emphasis on the last one hundred years.

Omitted 1960-61.

362. *The Modern History of Southeast Asia*. Comparative studies in the evolution of Southeast Asian social, political and ideologi-



cal developments beginning with the era of modern Western colonialism in the area.

Fall term.  
Mr. Harootunian

366. *Russia since Waterloo*. This seminar will emphasize diplomatic history, with some attention paid to domestic policy.

Omitted 1960-61.  
Mr. May

367. *The Modern Middle East*. After a rapid survey of the historical background, this seminar will stress the period since 1800. Particular attention will be given to the genesis of Turkish and Arab nationalism, to problems of economic development, and to the changing relations between the Middle Eastern states and the Western powers.

Omitted 1960-61.  
Mr. Christopher

See also Philosophy 340.

## PHILOSOPHY

There is no prerequisite for Philosophy 303. Before taking any other Philosophy Seminars, students should have completed Philosophy 101 or 104.

303. *Plato*. Intensive analysis of the early and middle dialogues, especially the *Republic*. Particular attention to the ethical and political doctrines. The influence of Plato upon Western thought and culture, and contemporary criticisms of his philosophy.

Fall term.  
Mr. Stolnitz

306. *Recent Philosophy*. Studies of some of the chief philosophical movements and their leading representatives.

Omitted 1960-61.  
Mr. Stewart

310. *The Structure and Scope of Knowledge*. An introduction to theories of knowledge, with special emphasis upon the various views of the origin, conditions of growth, criteria, and limits of knowledge.

Omitted 1960-61.  
Mr. Beck

320. *The Theory of Value*. Common philosophical problems in the study of values in art, morals, religion, economics; distinction between value and factual judgments, and the possibility of confirming value judgments in these fields. Readings in important recent theorists of value.

Omitted 1960-61.  
Mr. Stolnitz

340. *Philosophy of History*. A study of certain explicit theories of history such as those of Marx, Spengler, Toynbee, Niebuhr and others, with a consideration of problems of historical knowledge and the views implicit in varieties of historical writing.

Omitted 1960-61.  
Mr. Coates

341. *Aesthetics*. Intensive analysis of the problems of "truth" and "knowledge" in art: In what sense, if any, does art convey

"truth" or embody "knowledge"? What is the relation between "artistic truth" and the value or greatness of the work of art? How does artistic discourse differ from scientific discourse? Concrete reference to specific works of art, particularly in literature.

Spring term.  
Mr. Stolnitz

350. *Concepts of Mind*. A study of the metaphysical and psychological problem of the relation of mind and consciousness to bodily conditions, the foundations of psychological theory, the concept of human freedom, and philosophical disputes about immortality. The study will be based on important works in philosophy and psychology from Aristotle to Gilbert Ryle.

Fall term.  
Mr. Stolnitz or Mr. Turbayne

352. *Philosophy of Science*. A study of the methodology of science, and the nature of scientific proof and reasoning, designed to explain the significance of science in the modern world. No specific knowledge of science is presupposed.

Spring term.  
Mr. Stewart

380. *American Philosophy*. European and American cultural influences on American philosophical thought; philosophical tradition and innovation in American culture; the problems of philosophy as dealt with by leading American thinkers of the past two centuries.

Omitted 1960-61.

390. *British Empiricism*. Studies particularly in the philosophy of Locke and Berkeley.

Omitted 1960-61.  
Mr. Turbayne



## POLITICAL SCIENCE

All students registering for Honors Seminars in Political Science must have completed Political Science 101 and 102 unless excused by the instructor.

300. *The Role of War in International Politics.* An examination of war as an institution and its relation to the policy making process.

Omitted 1960-61.  
Mr. Diez

310. *Problems of Democratic Policy Formulation.* A study of the legislative and administrative processes as instruments of policy formulation in a democratic state. Attention will be given to the strengths and weaknesses of each and the relationships between the two. British and American experience will be used as the basis of the study.

Omitted 1960-61.  
Mr. Fenno

320. *Constitutional Issues.* A study in the growth of governmental power as determined by judicial interpretation of the Constitution. Emphasis will be placed upon the economic, social and political background of court cases as well as upon court decisions.

Fall term.  
Mr. Wiltsey

330. *The Theory of Revolution.* A study of the causes, agents, and typical forms of political revolution. Critical examination of some important theories of revolutionary change through their application to the data of selected recent revolutions.

Omitted 1960-61.  
Mr. Bluhm

340. *Political Leadership.* A consideration of leadership as it affects the political process. Personal characteristics and the functions of political leaders will be examined in the context of various political institutions.

Omitted 1960-61.  
Mr. Scher

350. *Contemporary India and Its Role in World Affairs.* This seminar will discuss the emergence of independent India from centuries of historical struggle to achieve a united country, beginning with the earliest times. It will also analyze political, economic, social and cultural developments in contemporary India, and the effect of these developments on India's foreign policy.

Spring term.  
Mrs. Dean

## Air Science

MAJOR R. W. TRIBOLET; CAPTAINS R. W. ABRAHAM, A. F. CREIGHTON; TECHNICAL SERGEANTS G. T. TEKELY, J. M. STROUT; STAFF SERGEANT R. A. BAETZEL.

101. *Air Force Leadership Laboratory I.* Elementary indoctrination in the manual of the airman, customs and courtesies of the service, maintenance of military manner and appearance, and the fundamentals of military drill.

*Credit—none.*

One one-hour Leadership Lab a week.  
Fall term.

102. *Foundations of Air Power I.* A general survey of air power to include the military instruments of national security, the elements and potentials of air power, the evolution of air warfare, and the study of air

vehicles. The leadership laboratory begun in the first semester is continued.

*Credit—two hours.*

Two lecture-recitations  
One one-hour Leadership Lab a week.  
Spring term.

111. *Foundations of Air Power II.* A general survey of air power to include the evolution of air warfare, the elements of air warfare such as targets, weapons, bases, and air vehicles, the employment of air forces, and the present and future capabilities and implications of operations in space. Leadership laboratory begun in the first year is



continued with emphasis on leadership at the element level.

*Credit—two hours.*

Two lecture-recitations

One one-hour Leadership Lab a week.

Spring term.

112. *Air Force Leadership Lab II.* A continuation of Air Force Leadership Laboratory I with emphasis on proficiency in instructing and directing the laboratory activities of subordinate cadets. Includes military organization and functions up to wing level. Military exercises in use of the command voice and conducting personal inspections are also included.

*Credit—none.*

One one-hour Leadership Lab a week.

Spring term.

201. *Air Force Officer Development I.* Knowledge and skills required of a junior officer in the Air Force. This includes staff organization and functions, communicating, instructing, and techniques of problem solving.

*Credit—three hours.*

Four lecture-recitations.

One one-hour Leadership Lab a week.

Fall term.

202. *Air Force Officer Development II.* Principles and practices of leadership. This in-

cludes basic psychology of leadership, the military justice system, and application of problem-solving techniques and leadership theory to simulated and real Air Force problems.

*Credit—three hours.*

Four lecture-recitations.

One one-hour Leadership Lab a week.

Spring term.

211. *Global Relations I.* A study of global relations of special concern to the Air Force officer with attention to such aspects as weather, navigation, geography, and international relations.

*Credit—three hours.*

Four lecture-recitations.

One one-hour Leadership Lab a week.

Fall term.

212. *Global Relations II.* Treatment of global relations is continued with attention to the concepts of the military aspects of political geography; maps and charts; factors of power; and the geographic influences upon political problems with a geopolitical analysis of the strategic areas.

*Credit—three hours.*

Four lecture-recitations.

One one-hour Leadership Lab a week.

Spring term.

## Anthropology and Sociology

Associate Professor COHN; Assistant Professors HARPER, SANGREE.

A program of concentration in Anthropology and Sociology requires the satisfactory completion of a minimum of 21 and a maximum of 30 course hours beyond Anthropology Sociology 101-102. Eighteen hours of required courses comprise the core of the anthropology and sociology program of concentration. At least three, and preferably six to nine hours, of the additional courses offered by the department are also expected of all concentrators. In addition every Anthropology and Sociology concentrator is expected to complete a substantial course of study in a related field in the social sciences, biological sciences, or the humanities, consisting of at least a six hour, and preferably a twelve to fifteen hour, related field.

**SAMPLE A.B. PROGRAM IN ANTHROPOLOGY AND SOCIOLOGY**

**Freshman Year**

		HOURS	
		<i>1st Term</i>	<i>2nd Term</i>
Engl. 101, 102	English Composition	3	3
Anthro. 101-102	Introduction to Anthropology and Sociology	3	3
Elective	Foreign Language	3	3
Elective	Group II	3	3
Elective	Group III	3 or 4	3 or 4
Phys. Ed.	Physical Education	1	1
		<hr/>	<hr/>
		16 or 17	16 or 17

**Sophomore Year (1960-61)**

Engl. 103, 104	Introduction to Literature	3	3
Anthro. 230	Social Anthropology of South Asia	3	
Elective	Group II	3	3
Psych. 101-102	Introduction to Psychology	3	3
Elective	Group III	3	3
Anthro. 240	Culture Areas of Negro (Sub-Saharan) Africa		3
Phys. Ed.	Physical Education	1	1
		<hr/>	<hr/>
		16	16

**Junior Year (1961-62)**

Anthro. 201-202	Culture History of Man	3	3
Anthro. 204	Development of Contemporary Social Theories	3	
Anthro. 280	Social Organization and Bureaucracy in Modern Industrial Society		3
Psych. 242	Social Psychology		3
Elective	Group III	3	3
Anthro. 220	Culture and Personality	3	
Electives		3	3
		<hr/>	<hr/>
		15	15

**Senior Year (1962-63)**

Anthro. 205	Social Institutions of Modern Industrial Society	3	
Anthro. 203	Methods of Social Research	3	
Anthro. 206	Departmental Seminar for Seniors		3
Psych. 201-202	Experimental Psychology	3	3
Psych. 205	Comparative Psychology		3
Electives		6	6
		<hr/>	<hr/>
		15	15

101-102. *Introduction to Anthropology and Sociology.* The nature and development of culture; cultural patternings; the holistic approach; cultural universals and cultural diversity; the individual and society, the socialization of the individual; types of social groups—the family, the community, the state or nation; ascribed and achieved status and role; elements of social organization.

*Credit—six hours.*

Three hours a week.

Fall through Spring.

Mr. Harper, Mr. Sangree

Required of all concentrators (except the Class of 1961)

201-202. *The Culture History of Man.* The development of culture and the dawn of civilizations in the old and new worlds as revealed primarily from an examination of the archaeological evidence; the major culture areas of the world and their relationship to these early "cradles" of civilization; problems of historical reconstruction; theories of diffusion; context and comparability; utilization of linguistic evidence. The holistic approach to the study of cultures; the social organization of selected contemporary cultures.

*Credit—six hours.*

Three hours a week.

Fall through Spring.

Mr. Cohn, Mr. Sangree

203. *Methods of Social Research.* Approaches to the understanding of society and culture; community study techniques; surveys; small group research; review of the methodology employed in selected research studies; formulation of research designs.

*Credit—three hours.*

Three hours a week.

Fall term.

Mr. Harper

204. *Development of Contemporary Social Theories.* An examination of writings of some of the men who have commented on the nature of society: L.H. Morgan, Boas, Spencer, Simmel, Durkheim, Max Weber, Radcliffe-Brown, Malinowski, Parsons, Merton.

*Credit—three hours.*

Three hours a week.

Fall term.

Mr. Cohn

205. *The Social Institutions of Modern Industrial Society.* The description of the general patterns of behavior of modern industrial society; social class behavior; political

behavior; religious behavior; industrial behavior; the interrelationships of institutions; change in institutions.

*Credit—three hours.*

Three hours a week.

Fall term.

Mr. Harper

206. *Departmental Seminar for Senior Anthropology-Sociology Concentrators.* The primary purpose of this seminary will be to review the major contemporary trends in Social Anthropology and Sociology in an effort to formulate an integrated picture of social processes.

*Credit—three hours.*

Three hours a week.

Spring term.

Mr. Harper

#### Electives:

In addition to the 18 hours of required courses listed above, concentrators in the field of Anthropology and Sociology must take no less than three hours and no more than twelve hours of the following subjects.

210. *Culture Contact and Social Change.*

Problems of cultural diffusion; analysis of types of culture contact and cultural interchange; the nativistic movement; the charismatic leader and the legitimization of authority.

*Credit—three hours.*

Three hours a week.

Spring term.

Mr. Sangree

220. *Culture and Personality.* Relation of culture and social structure to the development of personality; analysis of national character; relation of subcultures and personality traits.

*Credit—three hours.*

Three hours a week.

Omitted 1960-61.

230. *Social Anthropology of South Asia.*

Ethnology of South Asia with emphasis upon the relationship between tribal and village cultures and the high civilizations of the area.

*Credit—three hours.*

Three hours a week.

Fall term.

Mr. Cohn

234. *Special Sociological Field Investigations.*

Supervised field work; skills in gathering of data in real social situations; placements in



selected community social agencies. Limited to senior concentrators only.

*Credit—three hours.*  
Fall and Spring terms.  
Staff

240. *Culture Areas of Negro (Sub-Saharan) Africa.* Major culture areas of negro Africa; detailed ethnographic studies; nature and diversity of the indigenous social structure.

*Credit—three hours.*  
Three hours a week.  
Spring term.

260. *Peasant Society and Culture.* Peasant Society as an ideal type midway between folk and urban society; a review of selected peasant communities in Europe, Asia, Middle America, etc.; the relationship between peasant communities and urban centers.

*Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.

270. *Comparative Political and Legal Systems.* An analysis of the mechanisms for sanctioning an arbitrating social behavior in selected non-European cultures. Primarily South Asian and African political and legal

systems will be examined.

*Credit—three hours.*  
Three hours a week.  
Spring term.  
Mr. Cohn

280. *Social Organization and Bureaucracy in Modern Industrial Society.* Social organization of large organizations such as schools, factories, hospitals, governmental agencies, etc.; development and growth of bureaucracy; problems of bureaucracy; the impact of the bureaucratic organization on the individual; the emergence of small informal groups in large organizations; the recruitment of personnel to the organization; the socialization of personnel.

*Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.

291. *Special Problems.* The investigation, under guidance, of a special problem in selected areas of anthropology and sociology. By special permission of instructor only.

*Credit—three hours.*  
Fall and Spring terms.  
Staff



## Biology

PROFESSOR CASPARI (Chairman), HOLTFRETER; Visiting Professor TRUEMAN; Associate Professors \*COLEMAN (on leave Term I), LEWONTIN, MUCHMORE, RAVIN (on leave); Assistant Professors BANNISTER, CAMPBELL, KAYE, PUNNETT; Senior Research Associate KRIVSHENKO; Research Associate IYER; Graduate Assistants.

Students who wish to prepare for an academic or research career in biology may consider the program leading to the degree of Bachelor of Science (described on p. 117), or else plan to concentrate in biology under the regular course leading to the Bachelor of Arts degree. In the latter case students should consult the departmental adviser as early as possible, preferably at the start of the freshman year, to ensure arrangement of a suitable program.

*Concentration Program.* Students proposing to concentrate in the biological sciences under the Bachelor of Arts program should obtain a broad foundation in chemistry, physics, and mathematics, and—if feasible—acquire a reading knowledge of German or French. It is recommended that such students take *two* Group III courses from among Biology 101–102, Chemistry 121–122 (or 123–124), and Mathematics 100, 101. Chemistry should be one of the two selected *if* the student has not had high school Chemistry. It is also recommended that the Freshmen take a foreign language (French, German or Russian).

Ordinarily the schedule for the sophomore year would then include Chemistry (121–122 or 123–124 or 142 or 213), Physics 101–102, and two or more of the following: Biology 122, 125, 131, 132, 221. The program for the junior and senior years is arranged, with the aid of the departmental adviser, to include advanced courses in biology as well as related courses from the departments of chemistry, geology, mathematics, physics, and psychology.

The sample A.B. program in Biology shown below is based on the case of the incoming student who elects Biology and Mathematics in his Freshman Year.

Senior concentrators take Biology 295–296 as a substitute form of comprehensive examination.

*Education Program.* Requirements for secondary school teaching are given on page 201. The courses beyond Biology 101–102 which are particularly recommended as preparation for secondary school teaching are: Biology US116, 117, 122, 125, 131, 132, 220, and either 221 or US115.

\*Part-time.

## SAMPLE A.B. PROGRAM IN BIOLOGY

### Freshman Year

		HOURS	
		<i>1st Term</i>	<i>2nd Term</i>
Biol. 101-102	General Biology	4	4
Math. 100	Introductory College Mathematics	4	
Math 101 (or 105)	Elementary Calculus		4
Elective	Group I*	3	3
Elective	Group II	3	3
Engl. 101, 102	English Composition	3	3
Phys. Ed.	Physical Education	1	1
		<hr style="width: 100%;"/>	<hr style="width: 100%;"/>
		18	18

### Sophomore Year

Biol. 131	The Plant Kingdom	3	
Biol. 122	Invertebrate Zoology		3
Chem. 121, 122	General Chemistry	4	4
Physics 101-102	General Physics	4	4
Elective	Group I* or II	3	3
Phys. Ed.	Physical Education	1	1
		<hr style="width: 100%;"/>	<hr style="width: 100%;"/>
		15	15

### Junior Year

Biol. 125	Comparative Anatomy	4	
Biol. 221	Genetics	3	
Chem. 142	Quantitative Analysis		4
Chem. 161-162	Organic Chemistry	4	4
Elective	Group I* or II	3	3
Elective	Any group	3	3
		<hr style="width: 100%;"/>	<hr style="width: 100%;"/>
		17	14

### Senior Year

Biol. 241	Embryology	4	
Biol. 265	Cellular Physiology and Metabolism	3	
Biol. 220	Cellular Biology		3
Biol. 242	Experimental Embryology		
	or		
Biol. 270	Plant Physiology		
	or		
Biol. 272	Comparative Microbiology		3-4
Biol. 295-296	Senior Seminar	0	0
Electives	Any groups	8-9	8-9
		<hr style="width: 100%;"/>	<hr style="width: 100%;"/>
		15-16	14-16

\*It is strongly recommended that a foreign language be one of the Group I courses taken, so that a student acquires a reading knowledge of at least French, German or Russian by the Senior Year.

## B.S. IN BIOLOGY

Enrollment is restricted to students of high standing or promise in mathematics and science, and is thereafter subject to approval by the Department of Biology.

### Freshman Year

		HOURS	
		<i>1st Term</i>	<i>2nd Term</i>
Biol. 101-102	General Biology	4	4
Chem. 123, 124	General Inorganic Chemistry	4	4
Math. 100	Introductory Math.	4	
Math. 101	Elementary Calculus		4
Engl. 101, 102	English Composition	3	3
Ph. Ed.	Physical Education	1	1
		<hr style="width: 100%;"/>	
		16	16

### Sophomore Year

Biol. 131	The Plant Kingdom	3	
Biol. 132	Invertebrate Zoology		3
Chem. 213	Quantitative Analysis I	4	
Physics 101-102	General Physics A	4	4
Engl. 103, 104	Introduction to Literature <sup>1</sup>	3	3
	or		
Engl. 111-112	Survey of English Literature <sup>1</sup>		
Elective	Modern Foreign Language <sup>2</sup>	3	3
Elective			3
Ph. Ed. 11, 12	Physical Education	1	1
		<hr style="width: 100%;"/>	
		18	17

### Junior Year

Biol. 125	Comparative Chordate Anatomy	4	
Biol. 132	Botany of Flowering Plants		3
Biol. 220	Cellular Biology		3
Biol. 221	Genetics	3	
Chem. 161, 162	Organic Chemistry	4	4
Elective	Modern Foreign Language <sup>2</sup>	3	3
Elective	Group II	3	3
		<hr style="width: 100%;"/>	
		17	16

<sup>1</sup>Either Engl. 103, 104 or Engl. 111-112 is required for the program, but it may be postponed until the third or fourth year if this seems desirable. In this event a Group II course will be taken during the second year in place of English.

<sup>2</sup>At least two full-year courses in a modern foreign language (usually French, German or Russian) must be taken. This will insure that the student acquires a reading knowledge of at least one language other than English. In the event a student enters college with advanced standing in a language, study of a second language can be begun in the second or third year.

## Senior Year

		HOURS	
		1st Term	2nd Term
Biol. 265	Cellular Physiology and Metabolism	3	
Biol. 241	Embryology	4	
Two of:			6-8
Biol. 242	Experimental Embryology		
Biol. 270	Plant Physiology		
Biol. 272	Comparative Microbiology		
Biol. 291	Readings in Biology		
Biol. 293	Problems in Biology		
Biol. 295-296	Senior Seminar	0	0
Elective	Group II	3	3
Elective		6	6
		16	15-17

101-102. *General Biology*. An examination of the principles unifying modern biological knowledge through study of a variety of plants, animals, and microorganisms. The ways in which observations and experiments have led to present-day concepts and interpretations are considered, with the aim of arriving at an appreciation of the problems facing the biologist at the frontiers of his science. The course is offered to serve the needs of all students wishing to acquire a biological base for their cultural and intellectual education, and is an essential foundation for those who wish to pursue careers in the biological sciences.

*Credit—eight hours.*

Three lectures, one three-hour lab a week that includes conferences and demonstrations.

Fall through Spring.

Mr. Caspari, Staff, and Assistants

122. *Invertebrate Zoology*. A survey of the anatomy, physiology, behavior, life histories and evolution of animals constituting the principal groups of invertebrates. Biology 101-102 prerequisite.

*Credit—three hours.*

Three lectures or demonstrations, one three-hour lab a week.

Spring term.

Mr. Trueman

125. *Comparative Chordate Anatomy*. A study of the structural changes in the line of descent leading from primitive jawless fish to modern mammals, principally as a background for the understanding of human anatomy. The structure of a series of fossil vertebrates and the development and structure of a number of modern chordates are dealt with by laboratory observation, dissec-

tion or lecture. Biology 101-102 is prerequisite.

*Credit—four hours.*

Two lectures or conferences, two three-hour labs a week.

Fall term.

Mr. Muchmore

131. *The Plant Kingdom*. A study of the general biology of plants, with a survey of the plant kingdom. The structural, developmental, and ecological adaptations of plants are examined, and provide the basis for an understanding of the evolution of plants, of their distribution, and of their roles in the organic world. Biology 101-102 is prerequisite.

*Credit—three hours.*

Three lectures or conferences, one three-hour lab or field trip a week.

Fall term.

\*Mrs. Coleman

132. *Biology of Flowering Plants*. An introduction to plant anatomy, systematics, ecology and field work by study of the most advanced and dominant plants of the earth's vegetation. The evolutionary success of flowering plants is interpreted in terms of the advantages conferred by the vascular system and seed habit, two notable specializations which historically have linked plants to man. Biology 101-102 is prerequisite, as is Biology 131, or permission of the instructor.

*Credit—three hours.*

Three lectures or conferences, one three-hour lab or field trip a week.

Spring term.

\*Mrs. Coleman

\*Part-time.

213. **Statistical Analysis in Biology.** Elements of probability and combinatorial analysis. Principles of statistical inference and the testing of hypotheses as applied to biological problems. The design of experiments. Prerequisites: Mathematics 100, 101 (or equivalent).  
*Credit—three hours.*  
 Fall term.  
 Mr. Lewontin
220. **Cytology.** An introduction to the study of cells. Topics discussed will include the morphology and chemistry of chromosomes, mitochondria, the Golgi apparatus, centrioles, and the ergastoplasm. Prerequisite: Biology 101-102, Chemistry 121 and 122 (or 123 and 124) and Physics 101-102.  
*Credit—three hours.*  
 Three lectures or demonstrations, one three-hour lab a week.  
 Spring term.  
 Mr. Kaye
221. **Genetics.** Genes and cytoplasmic factors as the units of heredity; a general introduction to modern genetics including physiological, morphogenetic and evolutionary implications. Biology 101-102 is prerequisite.  
*Credit—three hours.*  
 Three lectures, one lab a week.  
 Fall term.  
 Mr. Lewontin
241. **General Embryology.** The early stages of development, including maturation and fertilization, cleavage and the formation of the primary germ layers. Development of tissues, organs and systems in vertebrates. Biology 101-102 and Biology 125 prerequisite.  
*Credit—four hours.*  
 Two lectures or conferences, two three-hour labs a week.  
 Fall term.  
 Mr. Holtfreter
242. **Experimental Embryology.** A practical and theoretical introduction to the experimental analysis of embryogenesis. Open, on approval of the instructor, to students who have satisfactorily completed Biology 241.  
*Credit—four hours.*  
 Two lectures or conferences, six hours lab a week.  
 Spring term.  
 Mr. Holtfreter
265. **Cellular Physiology and Metabolism.** A study of organisms from the point of view of cell function. Emphasis will be placed on properties of permeability, the chemical and physical properties of protoplasm, cellular metabolism, etc. Biology 101-102 is prerequisite; Organic Chemistry is prerequisite, or may be taken concurrently, unless instructor's permission is granted.  
*Credit—three hours.*  
 Two lectures, one three-hour lab a week.  
 Fall term.  
 Mr. Bannister
270. **Plant Physiology.** A study of physiological phenomena peculiar to higher plants. Topics will include water relations, translocation, growth and differentiation, tissue culture, plant hormones, germination, flowering and fruit development. Students will be required either to write a term paper on a selected problem or to perform some selected experiments under supervision in laboratory. Prerequisite: Biology 265.  
*Credit—three hours.*  
 Three lectures a week.  
 Spring term.  
 Mr. Bannister
272. **Comparative Microbiology.** An analysis of the physiological patterns of certain algae, bacteria and protozoa, and the evolutionary trends in these patterns. Topics considered are growth curves and their interpretation, adaptation and mutation, the evolution of metabolic pathways, the limitation imposed by size, and the evolution of structure. Biology 221, Biology 265 and Chemistry 161-162 (which may be taken concurrently) are prerequisite. Biology 131 is strongly recommended.  
*Credit—four hours.*  
 Three lectures, three hours lab a week.  
 Spring term.  
 Mr. Punnett
291. **Readings in Biology.** A special program of reading in advanced topics may be arranged according to the needs and interests of individual students. Biology 101-102 prerequisite. *Registration upon approval of departmental adviser.*  
*Hours and credits to be arranged.*  
 Fall and Spring terms.  
 Staff
293. **Problems in Biology.** Special problems may be arranged for advanced students wishing individual instruction in the methods of general biological, botanical, or zoological investigation. Biology 101-102 prerequisite.

Registration upon approval of departmental adviser.

Hours and credits to be arranged.  
Fall and Spring terms.  
Staff

295-296. *Senior Seminar.* A required course for all senior students concentrating in Biology, in which several questions related to important problems in modern biology will be considered. After a series of conferences and seminars with the staff, each senior is expected to write essays which will evaluate the significance of these problems and the methods by which the problems are being or may be explored.

No credit.  
One hour per week.  
Fall through Spring.  
Staff

COURSES OFFERED IN THE SCHOOL OF MEDICINE, with approval for college credit in certain cases.

117. *Microbiology.* A course in which bacteria, fungi, and viruses are studied from the point of view of their biological characteristics and of their importance in public health, industry, and agriculture. Biology 101-102 and Chemistry 121 and 122 or 123

and 124 prerequisite.

Credit—three hours.  
Lectures, two three-hour labs a week.  
Medical School.  
Fall term.  
Dr. Ritterson

COURSES OFFERED IN THE EVENING SESSION, with approval for college credit in the case of undergraduates other than Biology concentrators and pre-medical students.

US115. *Genetics and Human Heredity.* A study of the principles of inheritance with emphasis on genetically-determined human characteristics. Prerequisite: Biology 101-102 or the instructor's permission.

Credit—two hours.  
Two lectures a week.  
Mrs. Punnett

US116. *Survey of Mammalian Embryology.* A study of the normal embryonic development of mammals, including consideration of the mechanisms of development. Illustrations will be drawn largely from the normal and abnormal development of man, although other species will be used to illustrate the evolutionary and experimental aspects of embryology. Prerequisite: Biology 101-102 or the instructor's permission.

Credit—two hours.  
Two lectures a week.  
Mr. and Mrs. Berg

# Chemistry

Professors WIIG, DUNCAN, FRENCH, \*GATES, NOYES, TARBELL, WALTERS;  
Associate Professors BUFF, SAUNDERS (on leave); Assistant Professor  
WILSON; INSTRUCTORS AUTREY, BAKER, BLANN, KAMPMEIER.

Students planning to enter the Chemistry Course should present high school chemistry for admission in order to be prepared to take Chemistry 123 and 124 in the freshman year. If high school chemistry is not offered for admission, the student may find it necessary to take additional work in the subject in the Summer Session following the freshman year. A breakage deposit of \$10.00 each semester is required for all laboratory courses in Chemistry except Chemistry 161-162 for which the breakage deposit is \$12.00 per semester. Any surplus over the actual amount charged for breakage will be refunded.

\*Part-time.

## SAMPLE A.B. PROGRAM IN CHEMISTRY

NOTE: Students concentrating in Chemistry for the A.B. degree will take, as a minimum requirement, courses 121 and 122 or 123 and 124, 141, 142 and 214 or 213 and 214, 161-162, 251 and 252, 295, 296. The program of the junior and senior years should include approximately six year courses in the main field or fields of concentration and should meet all other general requirements for concentration stated on page 84. If a student wishes to meet the requirements for membership in the American Chemical Society upon graduation he should take, in addition to the minimum requirements, an advanced lecture course and an advanced laboratory course in chemistry.

Freshman Year		HOURS	
		<i>1st Term</i>	<i>2nd Term</i>
Chem. 123, 124 <sup>1</sup>	General Inorganic Chemistry	4	4
Math. 100, 101	Introduction to College Mathematics, Elementary Calculus	4	4
Engl. 101, 102	English Composition	3	3
Electives	Groups I and II	6	6
Phys. Ed.	Physical Education	1	1
		18	18

Sophomore Year		HOURS	
		<i>1st Term</i>	<i>2nd Term</i>
Chem. 161-162	Organic Chemistry	4	4
Phys. 101-102	General Physics A	4	4
Math. 150, 151	Intermediate Calculus		
or			
Math. 160, 161	Analytic Geometry, Calculus and Differential Equations	4	4
Elective	Modern language (German or Russian recommended)	3	3
Phys. Ed.	Physical Education	1	1
		16	16

Junior Year			
Engl. 103, 104	Introduction to Literature	3	4
Chem. 213, 214	Quantitative Analysis I & II	4	3
Chem. 251, 252	Physical Chemistry (or Senior Year)	4 or 0	4 or 0
Elective	Modern Language (German recommended)	3	3
Electives	Groups II and III	3 or 6	3 or 6
		17 or 16	17 or 16

Senior Year			
Chem. 251, 252	Physical Chemistry (or Junior Year)	0 or 4	0 or 4
Chem. 295-296	Senior Seminar	0	0
Electives		15 or 12	15 or 12
		15 or 16	15 or 16

<sup>1</sup>If Chemistry 121, 122 is taken, this is to be followed by Chemistry 141, 142; Chemistry 161-162; Chemistry 214; Chemistry 251, 252.

To satisfy the A.B. concentration requirement two year courses in Chemistry or related fields must be elected during the junior and senior years.

## B.S. IN CHEMISTRY

The B.S. in Chemistry devotes about one-half the time to required work in chemistry and closely related subjects; one-fourth to general college subjects, and leaves about one-fourth to be elected by the student. It is distinctly a professional course in chemistry, but may be taken with advantage by those wishing a broad education with the emphasis laid on this science. The synopsis of the course follows:

### Freshman Year

		HOURS	
		<i>1st Term</i>	<i>2nd Term</i>
Chem. 123, 124	General Inorganic Chemistry	4	4
Engl. 101, 102	English Composition	3	3
Math. 100 and 101	Introductory College Mathematics, Elementary Calculus	4	4
Physics 101-102 or Physics 107-108	General Physics A	4	4
Phys. Ed.	Physics I Physical Education	1	1
		16	16

### Sophomore Year

		HOURS	
		<i>1st Term</i>	<i>2nd Term</i>
Chem. 161-162	Organic Chemistry	4	4
German 101-102 or German 105, 106	Elementary German Scholarly and Technical Prose, Special Technical Readings	3	3
Math. 150, 151 or	Intermediate Calculus	4	4
Math. 160, 161	Analytic Geometry, Calculus and Differential Equations		
Physics 111-112 or Physics 117-118	General Physics B Physics II		
Elective	Group I (English 103, 104)	3	3
Phys. Ed.	Physical Education	1	1
		19	19

### Junior Year<sup>1</sup>

Chem. 213, 214	Quantitative Analysis I and II	4	4
Chem. 251, 252	Physical Chemistry	4	4
German 105, 106	Scholarly and Technical German Prose, Special Technical Readings	3	3
Electives	At least one Group II	6	6
		17	17

### Senior Year

Chem. 295, 296	Seminar	0	0
Chem. 291, 292	Thesis (research)	3	5
<b>One of the following:</b>			
Chem. 415	Advanced Analytical Lab.	2	
Chem. 435	Advanced Organic Lab.	4	
<b>Two of the following:<sup>2</sup></b>			
Chem. 412	Advanced Inorganic Chemistry		3
Chem. 413	Advanced Organic Chemistry	3	
Chem. 451	Advanced Physical Chemistry I	2	
Electives <sup>3</sup>	Complete Group II requirements	3-7	7-8
		15-16	15-16

<sup>1</sup>In the second term of the junior year, each student should select a thesis advisor and possibly the general area in which he will plan to do his thesis research. His advisor should be consulted with regard to registration for the senior year.

<sup>2</sup>Courses in Biology, Mathematics or Physics approved by the Department of Chemistry may be substituted.

<sup>3</sup>Students who intend doing graduate work in Physical Chemistry should make every effort to include Mathematics 200 and Physics 231 (Senior Year). For students planning to do graduate work in Organic Chemistry, Biochemistry 401 is recommended.

101. *Introductory General Chemistry I.* A terminal course for students who do not intend to continue with the study of Chemistry. The fundamental principles of Chemistry are developed and illustrated by application to the more common elements and compounds. The relationship of Chemistry to the other sciences and to the arts, history, economics, etc. is shown. This course is not an acceptable prerequisite for advanced courses.

*Credit—three hours.*

Two lectures, one recitation,  
one two-hour lab a week.

Omitted 1960-61.

Mr. Noyes and assistants

102. *Introductory General Chemistry II.* A continuation of Chemistry 101. That course or its equivalent prerequisite.

*Credit—Three hours.*

Two lectures, one recitation,  
one two-hour lab a week.

Omitted 1960-61.

111. *Elementary Chemistry.* An introduction to basic chemical theories and the chemistry of the important common elements and their compounds. The course is designed specifically for students in the Course in Nursing.

*Credit—four hours.*

Three hours, one lab a week.  
Fall term.

Miss French and assistants

112. *Elementary Organic Chemistry.* An introduction to the more important classes of organic compounds and reactions with special attention to those of biological interest. The course is designed specifically for students in the Course in Nursing but does meet the Organic Chemistry requirements of some dental schools. Prerequisite: Chemistry 101, or 111, or 121 or 123.

*Credit—four hours.*

Three hours, one lab a week.

Spring term.

Mr. Kampmeier and assistants

121. *General Chemistry I.* A careful study of the fundamental principles of chemical science and of the chemistry of several important metals and non-metals and their compounds. This course, less advanced than Chemistry 123, is primarily intended for pre-medical students and others who may plan to follow with Chemistry 141, 142 and for mechanical and electrical engineers and others not planning to continue work in Chemistry. Upon recommendation of the department, students may be transferred to Chemistry 123 during or at the end of the first term.

*Credit—four hours.*

Two lectures, two recitations,  
one lab a week.

Fall term.

Mr. Baker, Mr. Blann and assistants

122. *General Chemistry II.* A continuation of the concepts introduced in Chemistry 121 with more emphasis placed on the descriptive chemistry of the various elements of the periodic table. Organic chemistry is discussed briefly. An abbreviated scheme of semi-micro qualitative analysis is carried out in the laboratory. Emphasis is placed on structure of the atom and related topics. Prerequisite: Chemistry 121.

*Credit—four hours.*

Two lectures, two recitations,  
one lab period a week.

Spring term.

Mr. Baker, Mr. Blann and assistants

123. *General Inorganic Chemistry.* A more advanced course than Chemistry 121 designed primarily for students majoring in Chemistry, Chemical Engineering and Physics. The general principles underlying chemistry and some of the important non-metals and their compounds are considered. Upon recommendation of the department, students may be transferred to Chemistry 121 during the semester. Entrance Chemistry prerequisite.

*Credit—four hours.*

Two lectures, two recitations and  
two labs a week.

Fall term.

Mr. Wiig and assistants

124. *General Inorganic Chemistry and Qualitative Analysis.* A continuation of Chemistry 123. The chemistry of the metals and their compounds, atomic structure, natural and artificial radioactivity and the principles underlying qualitative analysis are studied. The laboratory work is devoted entirely to semi-micro qualitative analysis. Upon recommendation of the department, students may be transferred to Chemistry 122 during the semester. Chemistry 123 or its equivalent prerequisite.

*Credit—four hours.*

Two lectures, two recitations and  
two labs a week.

Spring term.

Mr. Wiig and assistants

141. *Qualitative Analysis.* A study of the physio-chemical principles of aqueous solutions of electrolytes which are of importance in qualitative analysis. Semi-micro methods are used in the laboratory. Chemistry 121 or 123 and Chemistry 122 prerequisite.

*Credit—four hours.*

Two hours, two labs a week.

Fall term.

Miss French and assistants

142. *Elementary Quantitative Analysis.* A course designed for students preparing for medicine and dentistry and for those who may wish to take a one-term elementary course in the subject. Biology, geology, or general science majors may wish to take this course. The principles, stoichiometry and techniques of quantitative analysis are developed and applied. Chemistry 121 and 122 or 123 and 124 prerequisite.

*Credit—four hours.*

Two hours, two labs a week.

Spring term.

Miss French and assistants

161-162. *Organic Chemistry.* A study of the more important classes of carbon compounds and the fundamental theories of organic chemistry. Chemistry 121, and 122 or 123 and 124 prerequisite.

*Credit—four hours.*

Three hours, two labs a week.

Fall through Spring.

Mr. Tarbell and assistants

213. *Quantitative Analysis I.* A course designed primarily for chemists and chemical engineers. The theories, fundamental principles and stoichiometry of quantitative analysis, and the techniques of quantitative methods are developed and applied. The course is more rigorous and exacting than Chemistry 142. Chemistry 123 and 124 prerequisite.

*Credit—four hours.*

Two lectures and two labs a week.

Fall term.

Mr. Noyes and assistants

214. *Quantitative Analysis II.* This course is a continuation of Quantitative Analysis I. A more comprehensive study is made of the principles of the science. Some of the laboratory work will involve the quantitative separation and determination of constituents in materials of industrial importance. Electrochemical, colorimetric, and other photometric methods will be included.

*Credit—four hours.*

Two lectures and two labs a week.

Spring term.

Mr. Wilson and assistants

251. *Physical Chemistry I.* The first semester's work consists of an introduction to thermodynamics and its interpretation from the molecular standpoint. The ability to apply these concepts is developed both by a large variety of problems, which the student is required to solve, and by laboratory work. Prerequisites: Physics (111-112 or 117-118):



Mathematics (115-116 or 117-118). Students who have had only Physics 101-102 must consult the instructor.

*Credit—four hours.*

Three lectures, one lab a week.

Fall term.

Mr. Buff, Mr. Duncan, assistants

**252. Physical Chemistry II.** The second course continues the application of thermodynamics to heterogeneous and homogeneous chemical equilibria and concludes with a treatment of chemical kinetics. Prerequisite: Chemistry 251.

*Credit—four hours.*

Three lectures, one lab a week.

Spring term.

Mr. Buff, Mr. Duncan, assistants

**\*261. Science in National and International Affairs.** The way important scientific advances have affected national affairs and international relations will be illustrated by selected examples. The scientific activities of the United States government and their relation to the national economy and the national defense will be discussed. The relation of government agencies to industry and to education will be emphasized. The scientific activities of the United Nations and its specialized agencies and their relation to the foreign policy of the United States will be considered. Without restriction for juniors and seniors; does not carry graduate credit.

*Credit—one hour.*

One hour a week.

Mr. Noyes

**291-292. Laboratory Problems in Chemistry.** Each student selects a topic the investigation of which will teach him how to attack a problem involving laboratory and library

\*Taken with the consent of the instructor.

work. Chemistry 415 or 435 prerequisite for Chemistry 292.

*Credit—three hours first semester,  
five hours second semester.*

Fall through Spring.

Staff

**\*293. Senior Reading Course in Chemistry.**

Students majoring in chemistry who are unable to register for other regularly scheduled, advanced courses may with special permission of the department register for this course.

*Credit—three hours.*

Three hours a week.

Fall term.

Staff

**\*294. Senior Reading Course in Chemistry.**

A continuation of 293.

*Credit—three hours.*

Three hours a week.

Spring term.

Staff

**295-296. Senior Seminar.** A seminar required of all senior students majoring in chemistry. Papers requiring journal or other library research are prepared under supervision of the staff members and presented orally before the seminar group. Satisfactory participation in this seminar is the approved substitute for a comprehensive examination in chemistry.

*No credit.*

One hour a week.

Fall through Spring.

Mr. Noyes, Mr. Autrey

**401. General Biochemistry.** This course will be given at the River Campus by members of the Biochemistry Department of the Medical School provided at least ten students register for credit. The course is designed primarily for graduate students and senior year undergraduate students in Chemistry who have had Organic Chemistry 161, 162 and Physical Chemistry 251, 252 or their equivalents, but other students may attend by special permission. Topics to be emphasized include the reaction sequences and cycles involved in the metabolism of carbohydrate, fat, nucleic acids, and amino acids, biosynthetic pathways, enzymatic mechanism, biological oxidation, and energy considerations. Less emphasis will be placed on biological and physiological aspects and on areas of the chemistry of natural products offered in other courses.

*Credit—two hours.*

Two hours a week.

Fall term.

Staff—Department of Biochemistry

\*412. *Advanced Inorganic Chemistry.* An advanced course in systematic inorganic chemistry taken up from the standpoint of the periodic law and supplemented by the study of special topics illustrative of recent advances in the subject.

*Credit—three hours.*  
Three hours a week.  
Spring term.  
Mr. Baker

\*415. *Advanced Analytical Laboratory.* The study of recently developed analytical procedures, colorimetry, spectrophotometry, spectroscopy, electrical methods, and other physico-chemical methods of analysis. The lectures, credit one hour, may be taken by graduate students who are not registered for the laboratory.

*Credit—four hours.*  
Fall term.  
Mr. Wilson

\*431. *Advanced Organic Chemistry.* An advanced study of the reactions of carbon compounds and the theories of organic chemistry.

*Credit—three hours.*  
Three hours a week.  
Fall term.  
Mr. Autrey

\*435. *Advanced Organic Laboratory.* The identification of organic compounds, organic semi-micro quantitative determinations, and

advanced preparations. Open to students who have had or are taking Chemistry 431.

*Credit—four hours.*  
Fall term.  
Mr. Kampmeier

\*451. *Advanced Physical Chemistry I.* Thermodynamics and its application to chemical systems.

*Credit—two hours.*  
Two hours a week.  
Fall term.  
Mr. Duncan

\*452. *Advanced Physical Chemistry II.* Emphasis will be placed primarily on those parts of Physical Chemistry which usually receive inadequate emphasis in a first course in the subject: (1) introduction to quantum problems such as the laws of radiation, photoelectric effect, energy levels of atoms and simple molecules, heat capacities, ionization and resonance potentials; (2) nuclear phenomena; (3) reaction kinetics including photochemistry and radiation effects; (4) surface phenomena.

*Credit—two hours.*  
Two hours a week.  
Mr. Noyes

For Industrial Chemistry and other courses in Chemical Engineering see pages 257, 255-256.

\*Taken with the consent of the instructor.

## Economics

Professors MCKENZIE, DUNKMAN, ECKSTEIN; Visiting Professors TSIANG, TSURU (Term II); Associate Professor FRANCE; Assistant Professors FOGEL, JONES (on leave), ROSETT, ZABEL; Visiting Assistant Professor CHOUDHRY; Research Associate CHAO; Technical Associate LI.

The Department of Economics offers a program of study for Bachelor of Arts candidates. Students majoring in economics are required to present six hours of mathematics. Economics 101-102 is prerequisite for all other courses in economics except with the special approval of the Department. Students who plan to concentrate in economics will normally be expected to have completed Economics 101-102 with a grade of C or better. This will not, however, assure admission to the concentration program unless the Department is confident that the student shows promise of successful academic work in this field of study.

Departmental requirements for concentration include Economics 207, 209, 281, and 285. Twenty-seven of the thirty-six hours specified by the College of Arts and Science for a concentration program must be courses in economics.

## SAMPLE A.B. PROGRAM IN ECONOMICS

### Freshman Year

		HOURS	
		<i>1st Term</i>	<i>2nd Term</i>
*Engl. 101, 102	English Composition	3	3
Math. 100, 101	Introduction to College Mathematics, Elementary Calculus	4	4
German 103-104	Introduction to German Civilization	3	3
Phil. 101, 102	Introduction to Philosophy, Ethics	3	3
Gov. 101, 102	European Political Systems American Political Systems	3	3
*Phys. Ed.	Physical Education	1	1
		<hr style="width: 50%; margin: 0 auto;"/>	<hr style="width: 50%; margin: 0 auto;"/>
		17	17

### Sophomore Year

*Econ. 101-102	Principles of Economics	3	3
Germ. 269	Goethe I	3	
Germ. 286	Modern German Prose Literature II		3
Physics 101-102	General Physics A	3	3
Hist. 101-102	Introduction to Contemporary Civilization	3	3
Math. 150, 151	Intermediate Calculus	4	4
*Phys. Ed.	Physical Education	1	1
		<hr style="width: 50%; margin: 0 auto;"/>	<hr style="width: 50%; margin: 0 auto;"/>
		17	17

### Junior Year

*Econ. 207	Intermediate Economic Theory	3	
*Econ. 209	National Income Analysis		3
*Econ. 231	Economic Statistics	3	
*Econ. 291	Junior Reading Course		1
Econ. 213	Monetary and Central Banking Policy		3
Phil. 216	Formal Logic	3	
Phil. 252	Philosophy of Science		3
Hist. 233, 234	American Economic History	3	3
Music 101, 102	Music Appreciation	3	3
		<hr style="width: 50%; margin: 0 auto;"/>	<hr style="width: 50%; margin: 0 auto;"/>
		15	16

### Senior Year

*Econ. 293	Senior Reading Course	2	
Econ. 225	Economic Development	3	
Econ. 269	International Economic Relations	3	
Econ. 223	Labor Problems		3
Econ. 267	Business Cycles		3
Math. 231	Vectors & Matrices	3	
Hist. 266	The History of Russia II		3
Gov. 251, 252	International Politics	3	3
Engl. 163	18th Century English Novel	3	
Engl. 164	19th Century English Novel		3
		<hr style="width: 50%; margin: 0 auto;"/>	<hr style="width: 50%; margin: 0 auto;"/>
		17	15

\*Required courses for Economics majors.

- 101-102. Principles of Economics.** A survey course of economic principles and problems. Economics 101-102 is prerequisite for all advanced courses in economics. *A student must receive a passing grade in Economics 101 to continue in Economics 102.*
- Credit—six hours.*  
Three hours a week.  
Fall through Spring.  
Mr. Dunkman, Mr. Rosett, Mr. Zabel, Mr. France, Mr. Choudhry, Mr. Fogel, Mr. Chao
- 207. Intermediate Economic Theory.** An analysis of economic equilibrium. Analyses will include conditions of free competition and various degrees of monopoly control. Some attention also is given to the theory of distribution dealing with wages, rent, interest, and profits.
- Credit—three hours.*  
Three hours a week.  
Spring term.  
Mr. Zabel
- 209. National Income Analysis.** The family of national income concepts, the distinction between intermediate and final products, the social accounting framework and approach, and national income as a measure of economic structure and growth will be analyzed. National income accounts will be used as a tool for examining the economic structure and rates of growth of the United States and other countries.
- Credit—three hours.*  
Three hours a week.  
Fall term.  
Mr. Rosett
- 211. Money, Credit and Banking.** An introduction to the study of money and credit. Major emphasis is placed on those institutions in which the money supply is generated and on the influence of monetary and fiscal policy on economic stability and growth. Descriptions, statistics and historical experiences are taken mainly from internal problems of the United States.
- Credit—three hours.*  
Three hours a week.  
Fall term.  
Mr. Dunkman
- 213. Monetary and Central Banking Policy.** Building upon Economics 211, a more intensive study of monetary policy is undertaken in which the interrelations of money, incomes, expenditures, price levels, interest rates, and foreign exchange rates are emphasized. Federal Reserve and fiscal policies are reviewed with attention to post-World War II problems. Economics 211 prerequisite.
- Credit—three hours.*  
Three hours a week.  
Spring term.  
Mr. Dunkman
- 221. Labor and the Government.** A study of the growth and development of trade unions and legislation concerning their activities. Attention is given to both state and federal control of unionization, collective bargaining, and labor disputes. Social security, wages and hours regulation, and antidiscrimination legislation are also covered.
- Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.  
Mr. France
- 223. Labor Problems.** An analysis of the problems raised in the process of determining wages and other conditions of employment in an industrial society. Emphasis is placed on the impact of the policies and practices of unions on workers, management and the public. Consideration is given to economic factors and other issues involved.
- Credit—three hours.*  
Three hours a week.  
Spring term.  
Mr. France
- 225. Economic Development.** Part I of this course will deal with problems of underdeveloped areas and with the strategy of development. This will involve an examination of the stimulants to economic change and growth, and the conditions and prerequisites for industrialization. Part II will survey and appraise contemporary development theories against the background of factors discussed in Part I. Prerequisite Economics 207 or the permission of the instructor.
- Credit—three hours.*  
Three hours a week.  
Spring term.  
Mr. Tsuru
- 227. Major Factors in American Economic Development.** An analysis of the main features of American economic growth since 1800. Recent statistical studies of national product, industrial structure and capital formation will be evaluated. Considerable use will be made of price theory and modern growth theory.
- Credit—three hours.*  
Three hours a week.  
Fall term.  
Mr. Fogel

231. **Economic Statistics.** The basic ideas and methods of descriptive statistics and statistical inference. Subjects covered are sampling distributions, statistical tests, estimation of parameters, regression, and time series. The size of this class may not exceed 25.

*Credit—three hours*  
Three hours a week.  
Fall term.  
Mr. Choudhry

245. **Government and Business.** This course examines, against the historical background and in relation to general economic theory, the problems created for the American economy by the intervention of government in the workings of the free enterprise system especially in the fields of business enterprise, finance, foreign trade, labor, and agriculture. Particular attention is given to recent legislation and judicial decisions.

*Credit—three hours.*  
Three hours a week.  
Spring term.  
Mr. Fogel

249. **Comparative Economic Systems.** Analysis of the functioning and comparative performance of the American and Soviet economies in terms of the pattern of resource allocation, degree of economic control and planning, market structure, and stagnation or growth. This will involve the definition of theoretical criteria for model economic systems by which the actual American and Soviet experience may be appraised.

*Credit—three hours.*  
Three hours a week.  
Fall term.  
Mr. Eckstein

253. **The Canadian Economy.** This course, conducted by the seminar method, will study the development and structure of the expanding Canadian economy in terms of population growth, gross product and other basic characteristics. The critically important economic relations of the United States and Canada will receive special attention. With consent of the instructor.

*Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.

263. **Taxation and Fiscal Policy.** A study of the principles, practices and economic effects of government expenditure, revenue, and debt with special reference to taxation in the United States.

*Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.  
Mr. Dunkman



267. **Business Cycles.** A course in the history and theory of business cycles. Some knowledge of statistical methods is desirable but not prerequisite. Special consideration is given to present conditions and the control of future cycles.

*Credit—three hours.*  
Three hours a week.  
Spring term.  
Mr. Choudhry

269. **International Economics.** An examination of trade patterns according to comparative advantage. The use of commercial policy in altering the gains from trade and distribution of income. Balance of payments, problems of adjustment. The role of the United States in the world trading community.

*Credit—three hours.*  
Three hours a week.  
Fall term.  
Mr. Tsiang

285. **Senior Seminar.** Required of all seniors concentrating in economics, with the exception of Honors majors. Students will write short essays on particular problems in economics which will serve as a basis for discussion in seminar meetings.

*Credit—three hours.*

291. **Junior Reading Course.** By arrangement with the department to permit work beyond regular course offerings and to prepare junior majors for completion of the junior essay.

*Credit—one to three hours.*  
Spring term.

293. *Senior Reading Course.* By arrangement with the department to permit work beyond regular course offerings and to prepare senior majors for completion of the senior essay.

*Credit—two to three hours.*  
Fall term.

471-472. *Modern Value Theory.* A treatment of leading topics in value theory since 1870 with attention to the theories of pure competition, monopolistic competition, oligopoly, and general equilibrium. The works of major economists are given special emphasis. The subjects are developed to their present state in economic theory. Prerequisites: Economics 207 and 209.

*Credit—three hours.*  
Three hours a week.  
Fall through Spring.  
Mr. McKenzic

481. *Introduction to Mathematical Economics.* An elementary survey of topics in economic theory. Mathematical concepts are used to facilitate the understanding of these topics. Macro-economic as well as micro-economic models but an introduction to dynamic models is also presented. Prerequisites: Mathematics 151, Economics 207, Economics 209.

*Credit—three hours.*  
Three hours a week.  
Fall term.  
Mr. Zabel

485. *Introduction to Econometrics.* Application of statistics to economics. Design and estimates of economic models. Estimation of simultaneous equation systems. Prerequisites: Mathematics 105, Economics 231, 207, 209.

*Credit—three hours.*  
Three hours a week.  
Spring term.  
Mr. Rosett

## English

Professors FORD, DUNKEL (on leave), GILMAN (on leave), KOLLER (on leave Term II), SCHILLING; Visiting Professors HUNTER (Term II), SCHWARZ (Term I); Associate Professors FRANK, HINMAN, JAMISON, KAUFMANN, PLUTZIK; Assistant Professors GOLLIN, HAZLETT, HORSFORD, JOHNSON, RAUSCHENBUSCH; Instructors ASHLEY, \*BICKEL, GRAHAM, HADAS, McLEAN, MOORE, \*ROSENBLUM.

Clear and correct English is expected of students in papers and examinations throughout the college course. Students notably defective in English may be reported by any department to the Chairman of the Department of English for corrective work.

Students who expect to concentrate in English are advised to take History 221, 222 (The History of England and Greater Britain), preferably in the sophomore year. Other allied courses for juniors and seniors concentrating in English are History 231, 232, 245, 246, and 251, 252, Philosophy 103, 104, 241, 242, 282, Fine Arts 101, 102, 121, 205-206, 231-232, 241, 242, 244 and advanced courses in German, French, classical, and comparative literature.

In the junior and senior years English majors select not less than twenty-four credit hours from English and American literature and six to twelve hours from the allied fields of history, philosophy, fine arts, and foreign literatures. In addition to Shakespeare (six hours), majors take one course (three hours) from each of the following periods of literature: (1) medieval or renaissance, (2) Restoration or Milton or eighteenth century, and (3) nineteenth century. Concentrators thus have an opportunity to emphasize earlier or later periods and also to select courses in the drama, novel, and American literature in accord with their individual interests.

\*Part-time.

## A SAMPLE A.B. PROGRAM IN ENGLISH

### Freshman Year

		HOURS	
		<i>1st Term</i>	<i>2nd Term</i>
Engl. 101, 102	English Composition	3	3
Hist. 101-102	Introduction to Contemporary Civilization	3	3
Phil. 101	Introduction to Philosophy	3	
Phil. 102	Ethics		3
Elective	Group I (Foreign Language)	3	3
Elective	Group III (Laboratory Science)	4	4
Phys. Ed.	Physical Education	1	1
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		17	17

### Sophomore Year

Engl. 111-112 or	Survey of English Literature		
Engl. 103, 104	Introduction to Literature	3	3
Hist. 121, 122 or	History of England and Greater Britain		
Hist. 131, 132	The History of the United States	3	3
Phil. 103	Plato	3	
Phil. 104	History of Modern Philosophy		3
Fine Arts 101, 102	Introduction to the History of Art	3	3
Elective	Group I (Foreign Literature)	3	3
Phys. Ed.	Physical Education	1	1
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		16	16

### Junior Year

Engl. 231-232	Shakespeare	3	3
Engl. 226 or	Chaucer		3
Engl. 234	Seventeenth Century Literature		
Engl. 235	Milton	3	
Engl. 117, 118 or	Survey of American Literature		
{ Engl. 261	Renaissance Drama		
{ Engl. 262	Modern Drama		
or			
{ Engl. 263	Eighteenth Century English Novel		
{ Engl. 264	Nineteenth Century English Novel	3	3
Electives	Group III if requirements are not already satisfied	6	6
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		15	15

### Senior Year

Engl. 237 or	Dryden and the Restoration		
Engl. 241	Eighteenth Century Literature	3	
Engl. 251 or	Romantic Poetry		
Engl. 253	Victorian Poetry		3
Electives	English	6	3
Electives	Allied fields (Group III if requirements not already satisfied)	6	9
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		15	15

**101. English Composition I.** Instruction and practice in expository and argumentative writing; a study of discursive prose with exercises in logic and critical analysis of essays. Required of all freshmen except those exempted by the department on the basis of previous school record and high standing in placement tests.

*Credit—three hours.*  
Three hours a week.  
Fall term.  
Staff

**102. English Composition II.** Instruction and practice in critical writing, including the preparation of research papers; an introduction to forms and types of creative literature. Required of all freshmen except those exempted by the department on the basis of previous school record and high standing in placement tests. Prerequisite English 101 or its equivalent.

*Credit—three hours.*  
Three hours a week.  
Spring term.  
Staff

**103. Introduction to Literature I.** English 103, 104 is an introduction to the understanding and enjoyment of literature through the reading of great works. It considers them not only for their expression of the enduring problems of mankind but also for structure and style. The great works studied in English 103 extend from the Bible to *Don Quixote*. Open to all freshmen and sophomores, and to upper-class students concentrating in departments other than English. Either English 103, 104 or English 111-112 is prerequisite to all other literature courses in the department except for students who have had equivalent preparation elsewhere.

*Credit—three hours.*  
Three hours a week.  
Fall term.  
Staff

**104. Introduction to Literature II.** A continuation of English 103, this course extends the study of world masterpieces from *Hamlet* to contemporary literature. Prerequisite English 103.

*Credit—three hours.*  
Three hours a week.  
Spring term.  
Staff

**111-112. Survey of English Literature.** A historical survey of English literature from the beginning to 1900. Recommended but not

required as an alternative to English 103, 104 for freshmen or sophomores planning to concentrate in English or to do honors work in English. Either English 103, 104 or English 111-112 is prerequisite to all other literature courses in the department except to students who have had equivalent preparation elsewhere.

*Credit—six hours.*  
Three hours a week.  
Fall through Spring.  
Miss Koller, Mr. Johnson

**113. Speech.** A "fundamentals course," designed especially to clarify the principles underlying sound and effectual speaking of all sorts, in all circumstances. Supervised practice in, for example, group discussion, individual speeches, and reading aloud. Each section is limited to 15 students.

*Credit—three hours.*  
Three hours a week.  
Fall and spring terms.  
Miss Rauschenbusch

**115. Advanced Expository Writing.** Principles and practice of expository and narrative writing; frequent papers and exercises, with class discussion of student work. Generally open to juniors and seniors with grades of B or better in English 101, 102, Sophomores by special arrangement with the instructor.

*Credit—three hours.*  
Three hours a week.  
Fall term, Mr. Plutzik.

**116. Advanced Narrative Writing.** Short story workshop. Each student will be expected to write from 18,000 to 20,000 words during the term. The class will meet once a week for three hours for criticism and discussion. Frequent conferences with individual students will be held. The student will be encouraged to improve by constant comparison of his work with the best achievements in fiction. May be repeated for credit with the consent of the instructor. English 115 prerequisite.

*Credit—three hours.*  
Three hours a week.  
Spring term.  
Mr. Plutzik

**117. A Survey of American Literature from Colonial Times to 1865.**

*Credit—three hours.*  
Three hours a week.  
Fall term.  
Mr. Horsford

118. *A Survey of American Literature from 1865 to 1920.* English 117 is a prerequisite for English concentrators. (Offered in alternate years with English 119.)  
*Credit—three hours.*  
 Three hours a week.  
 Spring term.  
 Mr. Horsford
119. *A Survey of American Literature from 1920 to the Present.* English 117 is a prerequisite for English concentrators. (Offered in alternate years with English 118.)  
*Credit—three hours.*  
 Three hours a week.  
 Omitted 1960-61.  
 Mr. Gilman
122. *Drama and Theatre.* Designed primarily to enable students to "hear" and "see" plays as they read them. A close study of plays of various kinds, with reading aloud by the students and discussion of the relations of the written drama to its suitable production.  
*Credit—three hours.*  
 Three hours a week.  
 Spring term.  
 Miss Rauschenbusch
220. *Modern English Literature.* A study of English novels, poems, and plays from 1914 to the present.  
*Credit—three hours.*  
 Three hours a week.  
 Spring term.  
 Mr. Ford
221. *Modern Poetry.* A brief introduction to the background of contemporary poetry, followed by intensive study of the major figures from Gerard Manley Hopkins to Dylan Thomas.  
*Credit—three hours.*  
 Three hours a week.  
 Fall term.  
 Mr. Plutzik
222. *Modern Prose.* A close study of representative authors who have been particularly significant in expressing the consciousness of our time. Selected fiction and criticism, and also works of scientific prose important for their impact on imaginative writing.  
*Credit—three hours.*  
 Three hours a week.  
 Spring term.  
 Mr. Plutzik
225. *Medieval Literature.* A study of the principal English poems and prose works (exclusive of Chaucer) from the beginnings of English literature to 1500.  
*Credit—three hours.*  
 Three hours a week.  
 Omitted 1960-61.
226. *Chaucer.* The works of Chaucer, principally the *Canterbury Tales* and *Troilus and Criseyde*, and their linguistic and literary background.  
*Credit—three hours.*  
 Three hours a week.  
 Spring term.  
 Mr. Hinman
- 231-232. *Shakespeare.* Required for all students concentrating in English, and open to all sophomores, juniors, and seniors who have had English 103, 104 or its equivalent. Students expecting to enter honors work in English in the junior year are advised to take Shakespeare in the sophomore year.  
*Credit—six hours.*  
 Three hours a week.  
 Mr. Kaufmann
233. *Sixteenth Century Literature.* A study of the influence of Petrarch, Boccaccio, Castiglione, Erasmus, and Montaigne on the writers of the English Renaissance from Sir Thomas More to Edmund Spenser.  
*Credit—three hours.*  
 Three hours a week.  
 Fall term.  
 Miss Koller
234. *Seventeenth Century Literature.* A study of the leading poets and prose writers from the time of Spenser to 1660.  
*Credit—three hours.*  
 Three hours a week.  
 Omitted 1960-61.  
 Miss Koller
235. *Milton.* A study of the prose and poetry.  
*Credit—three hours.*  
 Three hours a week.  
 Spring term.  
 Mr. Frank
237. *Dryden and the Restoration.* A study of the poetry, drama, and selected prose of Dryden and his contemporaries.  
*Credit—three hours.*  
 Three hours a week.  
 Omitted 1960-61.  
 Mr. Johnson



241. *Eighteenth Century Literature.* A study of the poetry, drama, and prose (excluding the novel) between 1700 and 1798.  
*Credit—three hours.*  
 Three hours a week.  
 Fall term.  
 Mr. Johnson
247. *Study in the History of Ideas.* Analysis of literary works that reveal man's changing attitudes toward various ideas that have affected his destiny or revealed his nature.  
*Credit—three hours.*  
 Three hours a week.  
 Omitted 1960-61.
251. *Romantic Poetry.* A study of the major poetry of the early part of the nineteenth century.  
*Credit—three hours.*  
 Three hours a week.  
 Spring term.  
 Mr. Gollin
253. *Victorian Poetry.* A study of the major poetry of the Victorian era.  
*Credit—three hours.*  
 Three hours a week.  
 Omitted 1960-61.  
 Mr. Ford
255. *Nineteenth Century Prose.* A study of the most significant prose works of the century, not including the novel.  
*Credit—three hours.*  
 Three hours a week.  
 Omitted 1960-61.
257. *The Concept of the Comic Spirit.* The concepts of the comic spirit in great literature from the classics to the present.  
*Credit—three hours.*  
 Three hours a week.  
 Fall term.  
 Mr. Schilling
258. *The Concept of the Tragic Spirit.* The concepts of the tragic spirit in great literature from the classics to the present.  
*Credit—three hours.*  
 Three hours a week.  
 Spring term.  
 Mr. Schilling
259. *The Greek Classics in Translation.* The Greek classics in translation with special emphasis on their humanistic influence on later literature.  
*Credit—three hours.*  
 Three hours a week.  
 Omitted 1960-61.  
 Mr. Schilling
260. *The Roman Classics in Translation.* The Roman classics in translation with special emphasis on their humanistic influence on later literature.  
*Credit—three hours.*  
 Three hours a week.  
 Omitted 1960-61.  
 Mr. Schilling
261. *Renaissance Drama.* A study of the great period of English drama from Marlowe

- to Dryden, with special attention to varieties of tragic experience.  
*Credit—three hours.*  
 Three hours a week.  
 Fall term.  
 Mr. Hadas
262. *Modern Drama.* A study of great modern dramas from Ibsen to Eliot as reflectors of the main currents in modern thought and feeling.  
*Credit—three hours.*  
 Three hours a week.  
 Omitted 1960-61.
263. *The Eighteenth Century English Novel.* A study of the major novels of the period.  
*Credit—three hours.*  
 Three hours a week.  
 Fall term.  
 Mr. Hadas
264. *The Nineteenth Century English Novel.* A study of the major novels of the period.  
*Credit—three hours.*  
 Three hours a week.  
 Spring term.  
 Mr. Gollin
265. *History of the English Language.* This course is intended to acquaint the student with the methods and results of modern linguistic study, with special emphasis upon the nature of present-day English. Recommended for all students preparing to teach English.  
*Credit—three hours.*  
 Three hours a week.  
 Omitted 1960-61.  
 Mr. Hinman
271. *The Nineteenth Century American Novel.* An historical and critical study of the American novel from the beginning through Henry James, with attention to technique and form as well as to theme and social context.  
*Credit—three hours.*  
 Three hours a week.  
 Fall term.  
 Mr. Horsford
272. *The Modern American Novel.* An historical and critical study of the American novel from the rise of naturalism to the present, with attention to technique and form as well as to theme and social context.  
*Credit—three hours.*  
 Three hours a week.  
 Omitted 1960-61.
273. *Special Studies in American Literature.* A critical and historical examination of the literature of special periods, topics or genres, such as colonial literature, poetry, criticism, and Transcendentalism.  
*Credit—three hours.*  
 Three hours a week.  
 Omitted 1960-61.
- For Honors Seminars in English, see page 105.

## Fine Arts

PROFESSORS HERSEY, SUHR (on leave Term II); ASSOCIATE PROFESSOR MERRITT;  
 ASSISTANT PROFESSORS DOHANIAN, MENIHAN.\*

A concentration program in Fine Arts consists of from eighteen to thirty hours of Fine Arts courses, not including Fine Arts 101, 102, plus approved related courses to make a total of thirty-six hours. Of these six hours may be in creative art. Fine Arts 101, 102 are prerequisite to all concentration programs and should be taken not later than the sophomore year.

\*Part-time.

## SAMPLE A.B. PROGRAM IN FINE ARTS

### Freshman Year

		HOURS	
		<i>1st Term</i>	<i>2nd Term</i>
Fine Arts 101 <sup>1</sup>	Introduction to Ancient and Medieval Art	3	
Fine Arts 102 <sup>1</sup>	Introduction to Renaissance and Modern Art		3
Engl. 101, 102	English Composition	3	3
Elective	Group II	3	3
Elective	A foreign language	3	3
Elective	Group III	3 or 4	3 or 4
Phys. Ed.	Physical Education	1	1
		<hr/>	<hr/>
		16 or 17	16 or 17

### Sophomore Year

Fine Arts 111-112 or	Creative Sculpture		
Fine Arts 113-114 or	Drawing and Painting	3	3
Fine Arts 101, 102 <sup>2</sup>	Introduction to Ancient and Medieval Art; Introduction to Renaissance and Modern Art		
Engl. 103, 104	Introduction to Literature	3	3
Elective	A foreign language	3	3
Elective	Group II	3	3
Elective	Group III	3 or 4	3 or 4
Phys. Ed.	Physical Education	1	1
		<hr/>	<hr/>
		16 or 17	16 or 17

### Junior Year

Fine Arts 231-232 or	Italian Renaissance Painting		
Fine Arts 205-206 Fine Arts 203-204	Renaissance and Modern Architecture Medieval Art	3	3
Fine Arts 239-240 Fine Arts 111-112 or	Northern European Painting Creative Sculpture	3	3
Fine Arts 113-114 Electives	Drawing and Painting Group I or II	3 6	3 6
		<hr/>	<hr/>
		15	15

### Senior Year

Fine Arts 201, 202 or	Ancient Art		
Fine Arts 215, 216 Fine Arts 141	Interrelations of Art, Literature and Philosophy Modern European Painting to 1885	3 3	3 3
Fine Arts 142 Electives	Modern European Painting since 1885 Group I or II	9 9	3 9
		<hr/>	<hr/>
		15	15

<sup>1</sup>May in some cases be postponed until the second year, with substitution of Fine Arts 109-110, Representation and Design with Studio Practice; or Fine Arts 111-112, Creative Sculpture; or Fine Arts 109 and Fine Arts 200, Classical Mythology.

<sup>2</sup>Required if not taken in first year.

NOTE: Fine Arts 231-232, Fine Arts 241-242 and either Fine Arts 203-204, or Fine Arts 205-206 are normally required of all concentrators. Six hours of studio work are strongly recommended.

101. *Introduction to Ancient and Medieval Art.* This course and its sequel aim to introduce the student to the subject of western art through the interpretation of selected works of architecture, sculpture, and painting presented in relation to the historical and cultural forces that influence them. The aesthetic and expressionistic aspects of the visual arts are stressed, as well as their historical development. This course is devoted to Egyptian, Greek, Roman, Early Christian and Medieval art.

*Credit—three hours.*  
Three hours a week.  
Fall term.  
Mr. Hersey

102. *Introduction to Renaissance and Modern Art.* This course is a general introduction to Renaissance and modern art with special emphasis on the Italian, Flemish, Dutch and French schools of painting. It is a sequel to Fine Arts 101, but may be taken separately.

*Credit—three hours.*  
Spring term.  
Mr. Hersey

103. *Introduction to the Art of India and the Far East.* A selective survey of the art of India, China, and Japan. Examples of architecture, sculpture, painting, and metal work are discussed in their historic sequence and interpreted with regard to form and content.

*Credit—three hours.*  
Three hours a week.  
Fall term.  
Mr. Dohanian

109-110. *Representation and Design with Studio Practice.* Lectures on the theory of design and on the modes of drawing and painting, supplemented by actual practice in drawing and painting, including a systematic study of color relations. The course is concerned with the analysis of different methods of artistic expression, and seeks to develop personal standards for judging quality. It is designed primarily for freshmen. No previous art training is necessary.

*Credit—six hours.*  
Two labs of two hours  
and one lecture a week.  
Fall term (109).  
Mr. Merritt

111-112. *Creative Sculpture.* An introductory course in modelling and sculpture based upon a study of the living model. Consideration is given to such fundamentals as space

relations, rhythm, plasticity, and the relation of material to the sculptural art. The course includes work in clay, wood, stone, and ceramic media. No previous experience is necessary. Registration is limited to fifteen students.

*Credit—six hours.*  
Two three-hour studio periods a week.  
Fall through Spring.

113-114. *Drawing and Painting.* An opportunity to practice basic principles of drawing and painting in various media. The development of natural ability, often present but not recognized, is encouraged. The course consists mainly of studio work from life, supplemented by field trips. Emphasis in the first term is on various phases of line drawing; the second term is devoted mainly to water color. Previous experience in art is not prerequisite. Registration is limited to sixteen students. Admission only by consent of the instructor.

*Credit—six hours.*  
Two three-hour studio periods a week.  
Fall through Spring.  
Mr. Menihan

200. *Classical Mythology.* A study of the outstanding myths of the ancient Greek world, including their origin and their association with early painting, sculpture, and literature. The relation of Greek myths to those of the Orient and the Germanic peoples will also be stressed. Slides and photographs will be used in the classroom for illustration. Prerequisite: Fine Arts 101, English 103-104, or History 101-102, or the equivalent. No graduate credit.

*Credit—three hours.*  
Two hours a week.  
Fall term.  
Mr. Suhr

201. *The Art of Early Civilizations.* The course is devoted to a review of painting, sculpture, and architecture of the Stone Ages, the Aztec, Mayan and Incan civilizations of our own hemisphere, and of Egyptian, Mesopotamian, Persian and Minoan peoples. The lectures, which are illustrated, are designed to throw light on the religion, traditions, society, and cultural values of ancient peoples as they are expressed in their art forms. Prerequisite: Fine Arts 101, or History 101-102, or the equivalent.

*Credit—three hours.*  
Three hours a week.  
Fall term.  
Mr. Suhr

202. *Greek and Roman Art.* The course is devoted to a review of the painting, sculpture and architecture of ancient Greece and Rome. The lectures, which are illustrated, are designed to throw light on the religion, traditions, society, and cultural values of the Greeks and Romans as they are expressed in their art forms. Prerequisite, one of the following: Fine Arts 101, 200, History 101-102, Classics 251, 252, or the equivalent.

*Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.  
Mr. Suhr

203-204. *Medieval Art.* The first semester deals with the origin and development of Romanesque art in Italy, France, Spain, Germany, and England, with emphasis on architecture, sculpture, and manuscript illumination. The second semester is devoted to French Gothic art, especially architecture, and to its spread into other European countries. Fine Arts 101 or History 101-102 prerequisite.

*Credit—six hours.*  
Fall through Spring.  
Mr. Hersey

205-206. *Renaissance and Modern Architecture.* The course aims to develop a knowledge of the theory and problems of Renaissance and modern architectural design and to trace the development of architecture in Europe from the beginning of the Renaissance through the baroque and modern periods. Fine Arts 101, 102 or History 101-102 prerequisite.

*Credit—six hours.*  
Three hours a week.  
Omitted 1960-61.  
Mr. Hersey

215. *Interrelations of Art, Literature, and Philosophy.* The motivating ideals in the viewpoints of the Egyptian, Mesopotamian, Hebrew, Hindu, Chinese, and Greek cultures will be sought through an examination of the interplay of the art, literature, and philosophy of these peoples. Prerequisite, one of the following: History 101-102, Fine Arts 101, 102, or Philosophy 101, 102. No graduate credit.

*Credit—three hours.*  
Two periods a week.  
Fall term.  
Mr. Suhr

216. *Interrelations of Art, Literature, and Philosophy.* The motivating ideals in the

viewpoints of the Roman, Medieval, and Modern cultures will be sought through an examination of the interplay of the art, literature, and philosophy of these peoples. Prerequisite, one of the following: History 101-102, Fine Arts 101, 102, or Philosophy 101, 102. No graduate credit.

*Credit—three hours.*  
Two periods a week.  
Omitted 1960-61.  
Mr. Suhr.

222. *The Painting of China and Japan.* Masterpieces of Far Eastern painting will be studied in their historic contexts and in their relation to each other. Oriental painting techniques as well as individual, period, and national styles will be stressed.

*Credit—three hours.*  
Three hours a week.  
Spring term.  
Mr. Dohanian

231-232. *Italian Painting.* A survey of the principal schools of painting in Italy from the late thirteenth century to the eighteenth century. During the first term emphasis is initially placed on the late medieval artists Giotto, Duccio, and Ambrogio Lorenzetti, and subsequently on the Florentine school of the fifteenth century, where Masaccio, Piero della Francesca, Botticelli, and Leonardo da Vinci receive special consideration. The second term is given to a survey of High Renaissance art, Mannerism, and Baroque painting, as seen especially in the works of Raphael, Michelangelo, Titian, Pontorno, and Caravaggio. Fine Arts 102 or History 101-102 prerequisite.

*Credit—six hours.*  
Three hours a week.  
Fall through Spring.  
Mr. Merritt

239-240. *Northern European Painting.* A study of the development of painting in Europe from about 1400 to 1800. The first term will be devoted to the fifteenth and sixteenth centuries, particularly in the Netherlands, Germany, and France. The second term will deal with baroque and rococo painting in the north, including Spain. The work of El Greco, Rubens, Rembrandt, Poussin, and Watteau will receive particular emphasis. Fine Arts 102 or History 101-102 prerequisite.

*Credit—six hours.*  
Three hours a week.  
Omitted 1960-61.  
Mr. Merritt



241. *Modern European Painting to 1885.* A study of the rise of modern painting in Europe, especially France, from the late eighteenth century to about 1885. Neo-Classicism, Romanticism, Realism, and Impressionism are the main movements considered. Emphasis is placed on outstanding artistic personalities such as David, Delacroix, Goya, Daumier, Manet, Renoir, Degas, Monet, and Seurat. Fine Arts 102 or History 101-102 prerequisite.

*Credit—three hours.*  
Three hours a week.  
Fall term.  
Mr. Merritt

242. *Modern European Painting Since 1885.* A study of European painting from about 1885. After brief consideration of Impressionism, the anti-academic and experimental nature of modern tendencies in art is brought out by examination of the credos and chief exponents of Post-Impressionism, Expressionism, Fauvism, Cubism, Abstractionism, and Surrealism. The works of Cezanne, Gauguin, Vincent van Gogh, Munch, Matisse, and Picasso receive special emphasis. Fine Arts 102 or History 101-102 prerequisite.

*Credit—three hours.*  
Three hours a week.  
Spring term.  
Mr. Merritt

245. *American Architecture.* A study of the colonial, Early Republican, eclectic, and modern styles of American architecture from the seventeenth century to the present, with reference to the historical and cultural back-

ground which explains their character. Special attention will be given to the English colonial tradition, to the spirit of nationalism underlying the architecture of the Early Republic, and to the American contributions to the development of modern architecture. Study will be made of structures in Rochester and vicinity which illustrate phases of American architecture. Fine Arts 101 or History 101-102 prerequisite.

*Credit—three hours.*  
Two periods a week.  
Fall term.  
Mr. Hersey

246. *American Painting.* A survey of the development of painting in America from the seventeenth century to the twentieth century. Relationships with European art and the problems of amateur and artisan painting will be considered. Fine Arts 102 or History 101-102, or an equivalent, prerequisite.

*Credit—three hours.*  
Two periods a week.  
Spring term.  
Mr. Merritt

251-252. *Advanced Sculpture Studio.* The course is concerned with such problems as the portrait and human figure studied from life, creative sketching and composition, including the non-objective approach, execution of projects in various media such as stone, wood, lead, bronze, fired clay, brazed steel, and non-ferrous metals. Included is practice in mold making and casting in plaster of paris, terracotta, and concrete. Foundry practice stresses the lost-wax process from the preparation of the wax model to the final casting and finishing of the work. Prerequisite: Fine Arts 111-112 or previous experience in creative art. Admission by consent of the instructor. No graduate credit.

*Credit—six hours.*  
Two supervised periods of three hours and one period of independent work.  
Fall through Spring.

291. *Senior Reading Course.* Independent study under faculty guidance of a limited field of art history, or investigation of a problem related to an area of knowledge already familiar to the student. Open ordinarily only to senior concentrators in Fine Arts.

Fall and Spring terms.  
Staff

*Aesthetics and Art Criticism.* See Philosophy 241, 244.

# Foreign Languages

Professors CANFIELD (on leave Term I), HILL (Acting Chairman, Term I), HANHARDT, HARVEY, TOPAZIO; Associate Professors BETORET-PARIS, CLARK, MOSCRIP; Assistant Professors BRAUN, GIUFFRIDA, KLIMAS, WHITTEMORE; INSTRUCTOR MR. OBRECHT.

Students who enter the University with previous foreign language experience will be placed in courses in which they can make the most satisfactory progress on the basis of demonstrated aptitude and proficiency.

Language laboratories, conducted by native assistants, and limited to groups of about ten students, offer special opportunities for intensive oral-aural training at several levels, and laboratory exercises constitute an integral part of the language and linguistics courses.

The Department of Foreign Languages offers programs of concentration leading to the degree Bachelor of Arts in Classics or Latin, French Language or French Literature, German Language or German Literature and Spanish Language or Spanish Literature. For concentration in either a modern language or a modern literature, both the Composition-Conversation course and the Survey of Literature are required. For concentration in a modern language the course in the History of that Language will be required.

A concentration program in a literature will normally include at least three advanced courses in that literature, and concentration in a language, at least three advanced language-linguistics courses. Allied courses for concentration may be suggested from other foreign languages or literatures, or from the Departments of English, Philosophy, Fine Arts, History or Government.

**JUNIOR YEAR ABROAD.** Recognizing the increasing number of opportunities for study in foreign universities, and in the belief that the interchange of students between the United States and other countries is a contribution to international understanding as well as to the enrichment of the individual, the University of Rochester recognizes the Junior Year Abroad for qualified students of French, German and Spanish. Application should be made in the office of the Dean of Students.

The courses in Foreign Languages prepare a student to undertake graduate work in French, German, Spanish or Latin, or, in combination with certain courses in Education, to meet certification requirements for teaching these languages at the secondary-school level.

It is recommended that all students who plan to concentrate in a foreign language take language laboratory courses during their entire college course, and that they consider the advantages of the Junior Year abroad. For suggestions for Latin concentration, see Departmental Section of Bulletin.

## A SAMPLE A.B. COURSE IN FOREIGN LANGUAGES

### Freshman Year

		HOURS	
		<i>1st Term</i>	<i>2nd Term</i>
Engl. 101, 102 Fr., Ger., or Span. 103-104	English Composition	3	3
	Introduction to French, German, or Hispanic Civilization <sup>1</sup>		
or Fr., Ger., or Span. 121, 122	Composition and Conversation	3	3
or Fr., Ger., or Span. 131, 132	Survey of Literature		
Fr., Ger., or Span. 113-114	Spoken French, German, or Spanish <sup>2</sup>	1	1
Elective	Group II	3	3
Elective	A laboratory science	3 or 4	3 or 4
Elective		3	3
Phys. Ed.	Physical Education	1	1
		<hr style="width: 100%;"/>	<hr style="width: 100%;"/>
		17 or 18	17 or 18

### Sophomore Year

Engl. 103, 104	Introduction to Literature	3	3
Psych. 101-102	Introduction to Psychology	3	3
Fr., Ger., or Span. 121, 122	Composition and Conversation		
or Fr., Ger., or Span. 131, 132	Survey of Literature	3	3
Elective	Group II	3	3
Fr., Ger., or Span.	Advanced Course in Literature or Linguistics	3	3
Fr., Ger., or Span. 117-118	Advanced Spoken Languages	1	1
Elective		3	3
Phys. Ed.	Physical Education	1	1
		<hr style="width: 100%;"/>	<hr style="width: 100%;"/>
		17 or 18	17 or 18

### Junior Year

Fr., Ger., or Span. 119-120	Diction and Discussion	1	1
Fr., Ger., or Span.	Advanced Courses in Literature and Linguistics	6	6
Elective	Allied course (Foreign Language, English, History, etc.)	3	3
Elective	(In education, for prospective teachers)	3	3
Elective	Group III	3	3
		<hr style="width: 100%;"/>	<hr style="width: 100%;"/>
		16	16

### Senior Year

Fr., Ger., or Span.	Advanced Courses in Literature and Linguistics	6	6
Elective	Allied course (Foreign Language, English, History, etc.)	3	3
Elective	(In education, for prospective teachers)	3	3
Elective		3	3
		<hr style="width: 100%;"/>	<hr style="width: 100%;"/>
		15	15

<sup>1</sup>Students who have had more than two years of high school foreign language, and score well on the placement examination will enroll for French, German or Spanish 121, 122 or 131, 132.

<sup>2</sup>The laboratory course will correspond to the student's training and placement test score.

# Classics

Associate Professor MOSCRIP.

## Latin

NOTE: Latin 105 and Latin 104 or its equivalent, are prerequisite to further work in Latin. Allied courses for students concentrating in Classics or in Latin may be chosen from such courses as Art 101, 102, 115-116, 201, 202. Government 285, History 221, 241 or 242, Philosophy 103, and from advanced courses in literature, in English and in modern languages.

104. *The Aeneid of Vergil.* An introduction to epic literature, open to students entering college with three years of Latin.

*Credit—three hours.*  
Three hours a week.  
Spring term.  
Miss Moscrip

105. *An Introduction to Latin Literature.* Selections from various Latin writers.

*Credit—three hours.*  
Three hours a week.  
Fall term.  
Miss Moscrip

206. *Horace: The Odes and Epodes.* A study of Horace as lyric poet.

*Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.  
Miss Moscrip

223. *A Survey of Latin Poetry.* Selections from the principal Latin poets.

*Credit—three hours.*  
Three hours a week.  
Fall term.  
Miss Moscrip

225. *Letters of Cicero and Pliny.* A study of the letters and the historical background.

*Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.  
Miss Moscrip

227. *Tacitus: Agricola and Germania.* A survey of the first century of the Roman Empire.

*Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.  
Miss Moscrip

228. *Roman Comedy.* Reading of several plays of Plautus and Terence, and a study of the relations of Greek and Roman Comedy.

*Credit—three hours.*  
Three hours a week.  
Spring term.  
Miss Moscrip

230. *Vergil: The Eclogues and Georgics.* The earliest writings of Vergil, their literary background and influence.

*Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.  
Miss Moscrip

233. *Roman Satire.* A study of satire in Roman literature as illustrated by selections from Horace and Juvenal.

*Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.  
Miss Moscrip

235. *Roman Philosophy.* Selections from Lucretius and Cicero.

*Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.  
Miss Moscrip

245. *Latin Principles I.* A course designed to meet the needs of prospective teachers of Latin. A thorough review of the principles of Latin syntax and practice in the writing of Latin are combined with lectures and readings on the development of the Latin language and the life and character of the Romans.

*Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.  
Miss Moscrip

246. *Latin Principles II.* A continuation of 245.

*Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.  
Miss Moscrip

## Greek

NOTE 1: It is recommended that students who are preparing to teach Latin in the sec-

ondary schools take two years' work in Greek.

NOTE 2: Advanced courses other than those listed below will be offered by members of the department as the occasion for such courses arises.

101-102. *Elementary Greek*. Easy selections from Greek authors will be read in class.

*Credit—six hours.*  
Three hours a week.  
Fall through Spring.  
Miss Moscrip

211-212. *Introduction to Greek Literature*. More extensive reading in a variety of Greek authors including Homer and Plato.

*Credit—three hours.*  
Three hours a week.  
Fall through Spring.  
Miss Moscrip

221. *Greek Drama*.

*Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.  
Mr. Suhr

222. *Greek History*.

*Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.  
Miss Moscrip

231. *Greek Philosophy*.

*Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.  
Mr. Suhr

241. *Greek New Testament*. Translation and study of passages from the Gospels and Epistles.

*Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.

251. *Classical Civilization I*. A survey of the civilizations of Greece and Rome in the fields of literature, philosophy, history, science, politics, and art. A knowledge of Greek and Latin is not requisite; translations are used. Designed for all students who are interested either in the study of origins or in the Greek and Roman elements in our own civilization. Greece is studied.

*Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.  
Mr. Suhr

252. *Classical Civilization II*. A continuation of 251 with emphasis on Rome.

*Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.  
Mr. Suhr

*Interrelations of Art, Literature and Philosophy*  
(See Fine Arts, p. 138)

#### EUROPEAN LITERATURE IN TRANSLATION

285. *Modern European Novel and Drama from 1850-1900*. Readings in English translation of such representative authors as: Flaubert, Zola, Tolstoy, Dostoyevsky, Ibsen, Strindberg, Hauptmann.

*Credit—three hours.*  
Three hours a week.  
Fall term.  
Mr. Topazio and staff

286. *Modern European Novel and Drama Since 1900*. Readings in English translation of such representative authors as: Chekov, Gide, Mauriac, Sartre, Camus, Pirandello, Silone, Garcia Lorca, Mann.

*Credit—three hours.*  
Three hours a week.  
Spring term.  
Mr. Topazio and staff



# French

PROFESSORS HILL, HARVEY, TOPAZIO;  
ASSISTANT PROFESSOR WHITTEMORE.

101-102. *Elementary French*. An introductory study of the structure of the French Language and its basic vocabulary. Reading of selected graded texts.

*Credit—six hours.*  
Three hours a week.  
Fall through Spring.  
Mr. Harvey, Mr. Whittemore

103-104. *Introduction to French Civilization*.

A study of the important trends in the development of the civilization of France as reflected in representative works of French literature. Prerequisite: French 101-102 or equivalent.

*Credit—six hours.*  
Three hours a week.  
Fall through Spring.  
Miss Hill, Mr. Whittemore

105. *Readings in Scholarly and Technical French Prose*. Controlled readings in technical prose as a preparation for specialized use of the language. Prerequisite: French 101-102 or equivalent.

*Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.

106. *Specialized Technical Readings*. French readings in specialized areas of interest. Prerequisite: French 105 or equivalent.

*Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.

111-112. *Elementary French Conversation*.

An oral approach to basic French. Laboratory exercises in pronunciation, intonation, and general fluency.

*Credit—two hours.*  
Two labs a week.  
Fall through Spring.  
Mr. Whittemore, assistants

113-114. *Spoken French*. Intensive training in the oral aspects of the language toward the achievement of practical fluency in the French of everyday situations. Recommended

for students at the French 103-104 level and for other qualified students by permission of the instructor.

*Credit—two hours.*  
Two labs a week.  
Fall through Spring.  
Mr. Whittemore, assistants

117-118. *Advanced Spoken French*. This course aims toward the achievement of fluency within an extended range of vocabulary and idiom. Recommended for students in French 131, 132 and in French 121, 122 and for other qualified students by permission of the instructor.

*Credit—two hours.*  
Two labs a week.  
Fall through Spring.  
Mr. Whittemore, assistants

119-120. *French Diction and Discussion*. Assignment and discussion of topics from currently pertinent areas of interest. Recommended for juniors and seniors who are concentrating in French, and for other qualified students with permission of the instructor.

*Credit—two hours.*  
Two labs a week.  
Fall through Spring.  
Mr. Whittemore, assistants

121. *French Composition and Conversation*. A practical course in both oral and written composition. Analysis and application of acceptable usage.

*Credit—three hours.*  
Three hours a week.  
Fall term.  
Mr. Whittemore

122. *French Composition II*. A continuation of 121.

*Credit—three hours.*  
Three hours a week.  
Spring term.  
Mr. Whittemore

131. *Survey of French Literature before 1700*. Main currents of French literature from its beginnings to the end of the 17th century.

- Reading and appraisal of poetry, drama and novels typical of each period.  
*Credit—three hours.*  
 Three hours a week.  
 Fall term.  
 Mr. Topazio, Mr. Harvey
132. *Survey of French Literature from 1700 to 1950.* Main currents of French literature of the 18th, 19th and 20th centuries. Reading and appraisal of poetry, drama and novels typical of each period.  
*Credit—three hours.*  
 Three hours a week.  
 Spring term.  
 Mr. Topazio, Mr. Harvey
211. *The Linguistic Structure of French I.* Objective analysis of the phonemic, syntactical and semantic features of present-day French. Dialectal variations.  
*Credit—three hours.*  
 Three hours a week.  
 Omitted 1960-61.  
 Miss Hill
212. *The Linguistic Structure of French II.* A continuation of 211.  
*Credit—three hours.*  
 Three hours a week.  
 Omitted 1960-61.  
 Miss Hill
235. *History of the French Language I.* A study of the formation, development and present state of French as one of the Romance Languages. Examination of Old French texts.  
*Credit—three hours.*  
 Three hours a week.  
 Omitted 1960-61.
236. *History of the French Language II.* A continuation of 235.  
*Credit—three hours.*  
 Three hours a week.  
 Omitted 1960-61.
237. *Introduction to Romance Philology.* A comparative study of the development of the principal Romance Languages from their Latin origins.  
*Credit—three hours.*  
 Three hours a week.  
 Spring term.  
 Mr. Canfield
238. *Examination of Romance Texts.* A study of writings in Old French, Provençal, Italian, Spanish and Portuguese.  
*Credit—three hours.*  
 Three hours a week.  
 Omitted 1960-61.  
 Mr. Canfield
241. *Practicum in French.* Investigation of special linguistic problems under the direction of a member of the departmental staff.  
*Credit—three hours.*  
 Three hours a week.  
 Omitted 1960-61.
251. *French Literature Before 1500.* Chansons de geste, fabliaux, miracle and mystery plays, the Arthurian cycle, Villon.  
*Credit—three hours.*  
 Three hours a week.  
 Omitted 1960-61.  
 Miss Hill
252. *The Renaissance.* Rabelais, Ronsard, Montaigne and other humanists of the sixteenth century. Prose, poetry and theater.  
*Credit—three hours.*  
 Three hours a week.  
 Fall term.  
 Mr. Harvey
255. *Seventeenth Century Prose and Poetry.* Malherbe, Descartes, La Rochefoucauld, Mme de La Fayette, Mme de Sévigné, La Fontaine, Boileau, Pascal, Bossuet, La Bruyère, Saint Simon.  
*Credit—three hours.*  
 Three hours a week.  
 Omitted 1960-61.
256. *The Classical Drama.* The principal plays of Corneille, Molière, Racine.  
*Credit—three hours.*  
 Three hours a week.  
 Omitted 1960-61.  
 Mr. Harvey
265. *The Eighteenth Century.* Montesquieu, Diderot, Rousseau, Voltaire, Beaumarchais.  
*Credit—three hours.*  
 Three hours a week.  
 Spring term.  
 Mr. Topazio
275. *The Nineteenth Century I.* A study of romanticism and realism in French literature: Chateaubriand, Lamartine, Vigny, Hugo, Musset, Stendhal, Balzac.  
*Credit—three hours.*  
 Three hours a week.  
 Fall term.  
 Mr. Topazio

276. *The Nineteenth Century II.* A study of naturalism and symbolism in French Literature: Maupassant, Becque, Zola, France, Verlaine, Mallarmé, Rimbaud.

*Credit—three hours.*  
Three hours a week.  
Spring term.  
Mr. Topazio

285. *The Twentieth Century I.* French literature from 1900 to 1930: the novels of Gide, Proust, Duhamel; the drama of Claudel, Lenormand; the poetry of La Forge, Apollinaire, Valéry.

*Credit—three hours.*  
Three hours a week.  
Fall term.  
Miss Hill

286. *The Twentieth Century II.* French literature since 1930: the novels of Mauriac,

Malraux, Camus; the plays of Giraudoux, Anouilh, Sartre; the poetry of Eluard, St. John Perse.

*Credit—three hours.*  
Three hours a week.  
Spring term.  
Miss Hill

291. *Senior Reading Course I.* Study of special literary problems under the direction of a member of the departmental staff.

*Credit—three hours.*  
Three hours a week.  
Fall term.

292. *Senior Reading Course II.* A continuation of 291.

*Credit—three hours.*  
Three hours a week.  
Spring term.

## German

PROFESSOR HANHARDT; ASSOCIATE PROFESSOR CLARK;  
ASSISTANT PROFESSORS BRAUN, GIUFFRIDA  
and KLIMAS

101-102. *Elementary German.* An introductory study of the structure of the German language and its basic vocabulary. Reading of selected graded texts.

*Credit—six hours.*  
Three hours a week.  
Fall through Spring.  
Staff

103-104. *Introduction to German Civilization.* A study of the important trends in the development of German civilization as reflected in representative works of German literature. Prerequisite: German 101-102 or equivalent.

*Credit—six hours.*  
Three hours a week.  
Fall through Spring.  
Staff

105. *Readings in Scholarly and Technical German Prose.* Controlled readings in technical prose as a preparation for specialized use of the language. In the second semester students will read in their special fields of interest. Prerequisite: German 101-102 or equivalent.

*Credit—three hours.*  
Three hours a week.  
Fall term.  
Mr. Braun, Mr. Giuffrida

106. *Specialized Technical Readings.* German readings in specialized areas of interest. Prerequisite: German 105 or its equivalent.

*Credit—three hours.*  
Three hours a week.  
Spring term.  
Mr. Giuffrida, Mr. Braun

111-112. *Elementary German Conversation.* An oral approach to basic German. Laboratory exercises in pronunciation, intonation, and general fluency.

*Credit—two hours.*  
Two labs a week.  
Fall through Spring.  
Mr. Hanhardt, assistants

113-114. *Spoken German.* Intensive training in the oral aspects of the language toward the achievement of practical fluency in the German of everyday situations. Recommended for students at the German 103-104 level and for other qualified students by permission of the instructor.

*Credit—two hours.*  
Two labs a week.  
Fall through Spring.  
Mr. Hanhardt, assistants

- 117-118. *Advanced Spoken German.* The aim of this course is the achievement of fluency within an extended range of vocabulary and idiom. Recommended for students in German 131, 132 and in German 121, 122 and for other qualified students by permission of the instructor.  
*Credit—two hours.*  
 Two labs a week.  
 Fall through Spring.  
 Mr. Hanhardt, assistants
- 119-120. *German Diction and Discussion.* Assignment and discussion of topics from currently pertinent areas of interest. Recommended for juniors and seniors who are concentrating in German, and for other qualified students with permission of the instructor.  
*Credit—two hours.*  
 Two labs a week.  
 Fall through Spring.  
 Mr. Hanhardt, assistants
121. *German Composition and Conversation I.* A practical course in both oral and written composition. Analysis and application of acceptable usage.  
*Credit—three hours each term.*  
 Three hours a week.  
 Fall term.  
 Mr. Hanhardt
122. *German Composition and Conversation II.* A continuation of 121.  
*Credit—three hours.*  
 Three hours a week.  
 Spring term.  
 Mr. Hanhardt
131. *Survey of German Literature to 1800.* The main currents of German Literature from its beginnings to the present day. Reading and appraisal of poetry, novels and plays typical of each period.  
*Credit—three hours.*  
 Three hours a week.  
 Fall term.  
 Mr. Clark
132. *Survey of German Literature from 1800 to the present.* A continuation of German 131.  
*Credit—three hours.*  
 Three hours a week.  
 Spring term.  
 Mr. Clark
211. *The Syntactic Structure of the German Language.* Objective analysis of the phonemic, syntactical and semantic features of present-day German.  
*Credit—three hours.*  
 Three hours a week.  
 Omitted 1960-61.  
 Mr. Hanhardt
212. *Regional Variations of German.* Dialectal variations in German-language areas of Europe.  
*Credit—three hours.*  
 Three hours a week.  
 Omitted 1960-61.  
 Mr. Hanhardt
235. *History of the German Language to 1500.* A study of the formation, development and present state of German as one of the Germanic Languages. Examination of old German texts.  
*Credit—three hours.*  
 Three hours a week.  
 Fall term.  
 Mr. Hanhardt
236. *History of the German Language from 1500.* A continuation of German 235.  
*Credit—three hours.*  
 Three hours a week.  
 Spring term.  
 Mr. Hanhardt
241. *Practicum in German.* Investigation of special linguistic problems under the direction of a member of the departmental staff.  
*Credit—three hours.*  
 Three hours a week.  
 Omitted 1960-61.
255. *Eighteenth Century Literature I.* A study of the development of German literature during the eighteenth century with emphasis on the works of Lessing and Schiller.  
*Credit—three hours.*  
 Three hours a week.  
 Omitted 1960-61.  
 Mr. Clark
256. *Eighteenth Century Literature II.* A continuation of German 255.  
*Credit—three hours.*  
 Three hours a week.  
 Omitted 1960-61.  
 Mr. Clark
269. *Goethe I.* A study of Goethe's life and works.  
*Credit—three hours.*  
 Three hours a week.  
 Fall term.  
 Mr. Clark.

270. *Goethe II*. A continuation of German 269.  
*Credit—three hours.*  
 Three hours a week.  
 Spring term.  
 Mr. Clark
275. *Nineteenth Century Drama and Poetry*.  
 A study of the most important writers of German Romanticism and Realism with emphasis on the works of Kleist, Grillparzer, and Hebbel.  
*Credit—three hours.*  
 Three hours a week.  
 Fall term.  
 Mr. Braun
276. *Nineteenth Century Prose Literature*. A study of the more important prose writings.  
*Credit—three hours.*  
 Three hours a week.  
 Spring term.  
 Mr. Braun
277. *The German Novella I*. The history and development of the German novella, with special emphasis on the nineteenth century and including works of E.T.A. Hoffman, Eichendorff, Keller, C. F. Meyer, Storm, Thomas Mann, and Hesse.  
*Credit—three hours.*  
 Three hours a week.  
 Omitted 1960-61.  
 Mr. Braun
278. *The German Novella II*. A continuation of German 277.  
*Credit—three hours.*  
 Three hours a week.  
 Omitted 1960-61.  
 Mr. Braun
285. *Modern German Drama and Poetry*. The development of German literature since 1880 with emphasis on the works of Hauptmann, Thomas Mann, Hofmannsthal.  
*Credit—three hours.*  
 Three hours a week.  
 Omitted 1960-61.  
 Mr. Braun
286. *Modern German Prose Literature*. A continuation of German 285.  
*Credit—three hours.*  
 Three hours a week.  
 Omitted 1960-61.  
 Mr. Braun
291. *Senior Reading Course I*. For seniors concentrating in German. The character and scope of these courses are determined by special needs and interests of the individual students. By special permission only.  
*Credit to be arranged.*  
 Fall term.
292. *Senior Reading Course II*. A continuation of German 291.  
*Credit to be arranged.*  
 Spring term.  
 Staff

## Russian

- 101-102. *Elementary Russian*. An introductory study of the structure of Russian and its basic vocabulary. Exercises in pronunciation and intonation. Reading of graded texts.  
*Credit—six hours.*  
 Three hours a week.  
 Fall through Spring.  
 Mr. Klimas
- 103-104. *Introduction to Russian Civilization*. A study of the important trends in the development of the civilization of Russia as reflected in representative works of Russian literature. Prerequisite: Russian 101-102 or equivalent.
121. *Russian Composition and Conversation I*. A practical course in both oral and written composition. Analysis and application of acceptable usage.  
*Credit—three hours.*  
 Three hours a week.  
 Fall term.  
 Mr. Klimas
122. *Russian Composition and Conversation II*. A continuation of 121.  
*Credit—three hours.*  
 Spring term.  
 Mr. Klimas



## Spanish

PROFESSOR CANFIELD; ASSOCIATE PROFESSOR  
BETORET-PARIS; INSTRUCTOR OBRECHT.

- 101-102. Elementary Spanish.** An introductory study of the structure of the Spanish language and its basic vocabulary. Reading of selected graded texts.
- Credit—six hours.*  
Three hours a week.  
Fall through Spring.  
Mr. Obrecht
- 103-104. Introduction to Hispanic Civilization.** A study of the important trends in the development of the civilization of Spain and Hispanic America as reflected in representative works of Hispanic literature. Prerequisite: Spanish 101-102 or equivalent.
- Credit—six hours.*  
Three hours a week.  
Fall through Spring.  
Mr. Betoret-Paris
- 105. Readings in Scholarly and Technical Spanish Prose.** Controlled readings in technical prose as a preparation for specialized use of the language. In the second semester students will read in their special fields of interest. Prerequisite: Spanish 101-102 or equivalent.
- Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.
- 106. Specialized Technical Readings.** Spanish readings in specialized areas of interest. Prerequisite: Spanish 105 or its equivalent.
- Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.
- 111-112. Elementary Spanish Conversation.** An oral approach to basic Spanish. Laboratory exercises in pronunciation, intonation, and general fluency.
- Credit—two hours.*  
Two lab hours a week.  
Fall through Spring.  
Mr. Obrecht, assistants
- 113-114. Spoken Spanish.** Intensive training in the oral aspects of the language toward the achievement of practical fluency in the Spanish of everyday situations. Recommended for students at the 103-104 level and for other qualified students by permission of the instructor.
- Credit—two hours.*  
Two lab hours a week.  
Fall through Spring.  
Mr. Obrecht, assistants
- 117-118. Advanced Spoken Spanish.** This course aims at the achievement of fluency

- within an extended range of vocabulary and idiom. Recommended for students in Spanish 131, 132 and in Spanish 121, 122 and for other qualified students by permission of the instructor.
- Credit—two hours.*  
Two lab hours a week.  
Fall through Spring.  
Mr. Obrecht, assistants
121. *Spanish Composition and Conversation I.* A practical course in both oral and written composition.
- Credit—three hours.*  
Three hours a week.  
Fall term.  
Mr. Obrecht
122. *Spanish Composition and Conversation II.* Analysis and application of acceptable usage.
- Credit—three hours.*  
Three hours a week.  
Spring term.  
Mr. Obrecht
131. *Survey of Hispanic Literature I.* The main currents of Spanish literature from its beginnings to the present day. Reading and appraisal of poetry, novels and plays typical of each period.
- Credit—three hours.*  
Three hours a week.  
Fall term.  
Mr. Betoret-Paris
132. *Survey of Spanish-American Literature.* A study of the development of the literature of the Spanish speaking countries of America.
- Credit—three hours.*  
Three hours a week.  
Spring term.  
Mr. Canfield
211. *The Linguistic Structure of Spanish I.* Objective analysis of the phonemic, syntactical and semantic features of present-day Spanish. Dialectal variations of Spain and Hispanic America.
- Credit—three hours.*  
Three hours a week.  
Spring term.  
Mr. Canfield
212. *The Linguistic Structure of Spanish II.* A continuation of Spanish 212.
- Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.  
Mr. Canfield
235. *History of the Spanish Language.* A study of the formation, development and present state of Spanish as one of the Romance Languages.
- Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.  
Mr. Canfield
236. *Old Spanish Texts.* Examination of old Spanish texts.
- Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.  
Mr. Canfield
237. *Introduction to Romance Philology.* A comparative study of the development of the principal Romance Languages from their Latin origins.
- Credit—three hours.*  
Three hours a week.  
Spring term.  
Mr. Canfield
238. *Examination of Romance Texts.* A study of writings in Old French, Provençal, Italian, Spanish and Portuguese.
- Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.  
Mr. Canfield
241. *Practicum in Spanish.* Investigation of special linguistic problems under the direction of a member of the departmental staff.
- Credit—three hours.*  
Three hours a week.
255. *Spanish Literature of the Golden Age I.* A critical study of the picaresque novel, the *Quijote* and other works of Cervantes, and the drama and poetry of Spain's *Siglo de Oro*.
- Credit—three hours.*  
Three hours a week.  
Fall term.  
Mr. Betoret-Paris
256. *Spanish Literature of the Golden Age II.* A continuation of Spanish 255.
- Credit—three hours.*  
Three hours a week.  
Spring term.  
Mr. Betoret-Paris
275. *Spanish Literature of the Nineteenth Century.* Romanticism, Realism and Naturalism in Spain, with special reference to

- the *costumbrismo* movement and its significance.
- Credit—three hours.*  
Three hours a week.  
Fall term.
276. *Spanish Literature of the Nineteenth Century II.* A continuation of Spanish 275.
- Credit—three hours.*  
Three hours a week.  
Spring term.
281. *Spanish-American Literature I.* A review of the literary developments among the independent nations of Hispanic America; the political essay, the Modernist Movement in poetry and the novel of social protest.
- Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.  
Mr. Betoret-Paris
282. *Spanish-American Literature II.* A continuation of Spanish 281.
- Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.  
Mr. Betoret-Paris
285. *Spanish Literature of the Twentieth Century I.* The Generation of '98 and the introspective essay. Drama and poetry of self-analysis and social reform.
- Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.  
Mr. Betoret-Paris
286. *Spanish Literature of the Twentieth Century II.* A continuation of Spanish 285.
- Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.  
Mr. Betoret-Paris
291. *Senior Reading Course I.* Studies in special literary problems under the direction of a member of the departmental staff.
- Credit—three hours.*  
Three hours a week.  
Fall term.
292. *Senior Reading Course II.* A continuation of Spanish 291.
- Credit—three hours.*  
Three hours a week.  
Spring term.  
Staff

## Geology and Geography

Professor HOFFMEISTER (on leave); Associate Professors HALL, SUTTON (Acting Chairman); Assistant Professor LUNDGREN; Visiting Assistant Professor REVEL; and Assistants.

### Geology

**Concentration Program in Geology.** Students who concentrate in geology should become well grounded in the fundamentals of chemistry, physics, and mathematics. Some geography and a reading knowledge of a foreign language are of value.

Geology 101-102 is a prerequisite for all other courses in geology, except in the case of students majoring in other fields.

Students working for the A.B. degree in the department should take Geology 101-102 as early in their program as possible. This should be followed by Geology 121 and Geology 124.

Departmental advisers will aid students to select courses beyond the elementary level from within the department and in related fields.

For information concerning the degree Bachelor of Science with major in Geology see p. 153.

### A SAMPLE A.B. PROGRAM IN GEOLOGY

#### Freshman Year

		HOURS	
		<i>1st Term</i>	<i>2nd Term</i>
Geol. 101-102*	Introductory Geology	3	3
Math.—1 year*		4	4
Engl. 101, 102	English Composition	3	3
Elective	Group II	3	3
Elective		3	3
Phys. Ed.	Physical Education	1	1
		17	17

#### Sophomore Year

Geol. 121*	Introductory Paleontology	3	
Geol. 124*	Rocks and Minerals		3
Engl. 103, 104	Introduction to Literature	3	3
Chemistry—1 year*		4	4
Electives		6	6
Phys. Ed.	Physical Education	1	1
		17	17

#### Junior Year

Geol. 227*	Advanced Mineralogy	3	
Geol. 235*	Stratigraphy	3	
Geol. 246*	Structural Geology		3
Electives		9	12
		15	15

#### Senior Year

Geology and related <sup>1</sup>		3-6	3-6
Electives		12-9	12-9
		15	15

\*Courses required by department.

<sup>1</sup>Recommended courses are: Geology 241, 252, 274; Geography 207, 208.

## B.S. IN GEOLOGY

This is distinctly a professional program aimed at training students for professional positions in industry, teaching, and survey work, as well as preparing them for graduate work.

In addition to the essential courses in Geology, courses in other basic sciences are stressed. The program also permits a relatively wide selection of courses from the Social Sciences and the Humanities.

### Freshman Year

		HOURS	
		<i>1st Term</i>	<i>2nd Term</i>
Geol. 101-102	Introductory Geology	3	3
Engl. 101, 102	English Composition	3	3
Math. 100	Introductory Mathematics	4	
Math. 101	Elementary Calculus		4
Elective	Foreign Language	3	3
Elective		3	3
Phys. Ed.	Physical Education	1	1
		<hr/>	<hr/>
		16	16

### Sophomore Year

Geol. 121	Introductory Paleontology	3	
Geol. 124	Rocks and Minerals		3
Engl. 103, 104	Introduction to Literature	3	3
Chem. 121, 122	General Chemistry	4	4
or			
Chem. 123, 124	General Inorganic Chemistry, Qualitative Analysis		
Elective	Group II	3	3
Elective		3	
Geogr. 208	Economic Geography II		3
Phys. Ed.	Physical Education	1	1
		<hr/>	<hr/>
		17	17

### Junior Year

Geol. 227	Advanced Mineralogy	3	
Geol. 246	Structural Geology		3
Geol. 235	Stratigraphy	3	
Physics 101-102	General Physics A	4	4
Elective	Group II	3	3
Elective		3	3
Elective		3	3
		<hr/>	<hr/>
		16	16
Field Camp (min. 6 weeks) Summer		6	

### Senior Year

Geol. 241	Introductory Petrology		3
Geol. 252	Regional Geology		3
Elective	Geology	3	
Elective	Geology	3	
Elective	Science	3(4)	3(4)
Elective	Non-Science	3	3
Elective	Non-Science	3	3
		<hr/>	<hr/>
		15(16)	15(16)



101-102. **Introductory Geology.** A cultural course giving an insight into the composition, structure, and origin of the earth as revealed by the rocks, minerals, and land forms, and the history of its inhabitants as shown by the fossils preserved in the rocks. *First term:* Physical Geology. A study of the materials composing the earth and of the geologic agents and processes which have produced the present topographic and structural features. Several field trips. *Second term:* Historical Geology. The history and development of the earth as interpreted from the geologic record. The local rocks and fossils are studied both in the field and in the laboratory as illustrating the principles of geology. Several field trips.

*Credit—six hours.*  
Two lectures, one lab a week.  
Fall through Spring.  
Mr. Hoffmeister and assistants

121. **Introductory Paleontology.** A course designed to introduce the student to the subject by an examination of the principles of Paleontology and by a review of the invertebrate faunas of the past. Field trips.

*Credit—three hours.*  
Two lectures, one lab a week.  
Fall term.  
Mr. Hoffmeister

124. **Rocks and Minerals.** An introduction to the study of the geologically common and economically important rocks and minerals. The course is prerequisite to continued work

in geology but is designed to be readily accessible to nonscience majors. Laboratory: Megascopic study of rocks and minerals.

*Credit—three hours.*  
Two lectures, one lab a week.  
Spring term.  
Mr. Lundgren

227. **Advanced Mineralogy.** The optical properties, crystallography, and atomic structure of minerals are discussed. The laboratory is devoted to solving crystallographic problems and to the measurement of optical properties of minerals with the polarizing microscope. Analytic geometry, Chemistry 121, 124 and Physics 101-102 prerequisite.

*Credit—three hours.*  
Two lectures, one lab a week.  
Fall term.  
Mr. Lundgren

231. **Economic Geology I.** The geology of petroleum and natural gas.

*Credit—three hours.*  
Three lectures a week.  
Omitted 1960-61.  
Mr. Sutton

232. **Economic Geology II.** The geology of metalliferous ore deposits: fundamental principles of ore deposition combined with a study of specific mining districts. Geology 227 prerequisite.

*Credit—three hours.*  
Two lectures, one lab a week.  
Omitted 1960-61.  
Mr. Lundgren

233. **Pleistocene Geology.** Study of the topography and sediments associated with continental glaciation. Pleistocene deposits in non-glaciated regions are also considered. Local glacial phenomena are studied by means of short field trips.

*Credit—three hours.*  
Three lectures a week.  
Omitted 1960-61.

234. **Geomorphology.** Study of the origin of land forms with a brief consideration of the physiographic provinces of the United States.

*Credit—three hours.*  
Three lectures a week.  
Omitted 1960-61.

235. **Stratigraphy.** A study of the principles of stratigraphy including the application of fundamental principles of physical geology

and paleontology to problems of stratigraphy and paleogeography.

*Credit—three hours.*

Three lectures a week.

Fall term.

Mr. Sutton

241. **Introductory Petrology.** This course includes discussions of the occurrence and classification of igneous and metamorphic rocks and an introduction to the study of these rocks as chemical systems. Laboratory work consists of a study of rocks in thin section. Geology 227 prerequisite.

*Credit—three hours.*

Two lectures, one lab a week.

Spring term.

Mr. Lundgren

246. **Structural Geology.** The attitude of rocks in the earth's crust. The classification and origin of folds, faults, joints, and related features are discussed and shown in laboratory experiments. The geometric solution of structure problems is carried on in the winter months and the recognition and interpretation of structures are emphasized in the field.

*Credit—three hours.*

Two lectures, one lab a week.

Spring term.

Mr. Sutton

248. **Geochemistry.** An introductory survey of geochemistry. The course is designed to present a review of the contributions of chemistry, physics, and the other sciences to our understanding of the evolution of the earth. The following topics will be discussed: the internal constitution of the earth, the relationship between the chemistry of the earth

and the planets, measurement of geologic time and temperature, and isotope geology. The latter half of the course will include discussions of the principles of the geochemical separation of the elements and the processes by which this separation is effected. Chemistry 121, 122 or 123, 124 and Physics 101-102 prerequisite.

*Credit—three hours.*

Three lectures a week.

Spring term.

Mr. Lundgren

252. **Regional Geology.** Study of geologically strategic regions in the United States. In addition, the course emphasizes the interrelationships of the geological sciences as applied to regional studies. Geology 235 and 246 prerequisite.

*Credit—three hours.*

Two lectures, one lab a week.

Fall term.

Mr. Sutton

274. **Advanced Paleontology.** A detailed study of the several invertebrate groups most important to the geologist. Stress will be placed on origin, evolution, and comparison with recent organisms. Field trips.

*Credit—three hours.*

Two lectures, one lab a week.

Spring term.

Mr. Hoffmeister

295. **Senior Reading Course.**

*Credit to be arranged.*

The Staff

296. **Senior Reading Course.**

*Credit to be arranged.*

The Staff



# Geography

**Concentration Program.** Students who propose to concentrate in geography are urged to take selected courses in geology, biology, history, economics, and government. Geography 101-102 is a prerequisite for all other courses in geography, except in the case of students majoring in other fields of concentration. Credit obtained in Geology 233 and Geology 234 may be counted toward a major in Geography.

- 101-102. *Introductory Geography.*** A survey of the world regions as a human habitat. Emphasis will be placed on the relations between the natural environment and the various activities of man, such as agriculture and industries. Included are discussions on the major features of the continents and oceans.
- Credit—six hours.*  
Three hours a week.  
Fall through Spring.  
Mr. Hall
- 207. *Economic Geography I.*** A presentation of the world's most important agricultural resources and the environmental factors that control their production. Included are discussions on domestic animals, forests, and the major agricultural patterns as they occur in different parts of the world.
- Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.  
Mr. Hall
- 208. *Economic Geography II.*** A study of the world's important mineral resources dealing principally with factors controlling regional distribution, production, conservation, transportation, and consumption. The bearing of these factors on economic and political problems and on future regional changes is considered.
- Credit—three hours.*  
Three hours a week.  
Spring term.  
Mr. Hall
- 220. *Cartography.*** A course in the basic principles of map-making and map-interpretation, including work with aerial photographs and elementary field mapping.
- Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.
- 250. *Geography of the U.S.S.R.*** A geographical study of the Soviet Union with emphasis on the development of agriculture and industry in relation to the physical environment and natural resources.
- Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.
- 252. *Geography of South America.*** An introduction to the most recent developments in South America with emphasis on economic features and population problems as they occur in their natural environment.
- Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.
- 253. *Geography of Europe.*** A study of the physical and cultural geography of the continent of Europe.
- Credit—three hours.*  
Three hours a week.  
Fall term.  
Mr. Hall
- 258. *Geography of North America.*** A study of the physical, cultural, and economic aspects of the geography of the United States and Mexico.
- Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.
- 260. *Geography of Asia.*** A geographical study of the continent of Asia, including China, Japan, southeast Asia, India, and the Soviet Far East. Stresses the influence of the physical environment on the cultural and economic development of the various regions.
- Credit—three hours.*  
Three hours a week.  
Spring term.  
Mr. Hall
- 264. *Geography of Canada.*** A geographical study of Canada, stressing the influence of the physical environment on the economic and cultural development of the various parts of the country. Special emphasis is placed on the problems of resource development, transportation, and industrialization.
- Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.



## History

Professors VAN DEUSEN (on leave Term I), COATES (on leave Term I), MAY;  
Associate Professors CHRISTOPHER, M. WADE, R. WADE, WHITE (Acting  
Chairman, Term I); Assistant Professors HAROOTUNIAN, TOWLE;  
Instructor LINDLEY; Assistants.

NOTE: History 101-102 is considered prerequisite to all other courses in history except by special permission of the department. Graduate students are admitted to advanced courses in history only with the consent of the department, and graduate credit will be given only upon the performance of additional work.

A program of concentration in history includes the satisfactory completion of thirty-six hours beyond History 101-102. Of these not less than twenty-four or more than thirty may be taken in the history department, the remainder in allied fields. History majors should consult the departmental representative in making out their program.

Students concentrating in history are required to distribute their work in such a way as to include either History 291-292 or a minimum of six hours in the following pre-nineteenth century history courses: 211, 221, 227, 237, 241, 245, 246, 251.

The history department recognizes the value, for qualified history majors, of the Junior Year Abroad.

## SAMPLE A.B. PROGRAM IN HISTORY

### Freshman Year

		HOURS	
		<i>1st Term</i>	<i>2nd Term</i>
Engl. 101, 102	English Composition	3	3
Hist. 101-102	Introduction to Contemporary Civilization	3	3
Gov. 101	European Political Systems	3	
Gov. 102	American Political Systems		3
Phys. 101-102	General Physics A	4	4
Phys. Ed.	Physical Education	1	1
Elective	Foreign Language	3	3
		<hr/>	<hr/>
		17	17

### Sophomore Year

Engl. 103, 104	Introduction to Literature	3	3
Hist. 231, 232	The History of the United States	3	3
Psych. 101-102	Introduction to Psychology	3	3
Econ. 101-102	Principles of Economics	3	3
Elective	Foreign Language	3	3
Phys. Ed.	Physical Education	1	1
		<hr/>	<hr/>
		16	16

### Junior Year

Hist. 235, 236	The History of American Foreign Policy	3	3
Hist. 251, 252	European Thought and Institutions	3	3
Gov. 251, 252	International Politics	3	3
Electives	One from Group III	6	6
		<hr/>	<hr/>
		15	15

### Senior Year

Hist. 291-292	Intellectual History of the West	3	3
Hist. 221, 222	History of England and Greater Britain	3	3
Electives		9	9
		<hr/>	<hr/>
		15	15

NOTE: This program of study provides for completion of the thirty hours of history beyond the introductory course as well as the six hours of study in an allied field beyond the introductory course in that field. Furthermore, the student concentrating in history will have completed the five fields of study and the allied field demanded for admission to the comprehensive examinations in history given in the senior year. Concentrators are urged to choose electives in the literature of related periods in English, German, French, Spanish or Classics or to pursue further work in foreign languages if their ultimate goal is graduate work in history.

For Honors Seminars in History see pages 106-108, and for Ancient History see Classics 142, 143.

101-102. *Introduction to Contemporary Civilization.* A broad survey of the European background of western civilization from ancient times to the present day. Intellectual, religious, social, economic, and scientific developments are considered, as well as political evolution and international affairs.

*Credit—six hours.*  
Three hours a week.  
Fall through Spring.  
Mr. White, Assistants

211. *The Graeco-Roman World.* A study of the basic ideas, institutions and problems of Graeco-Roman civilization during the transition from tribe to city-state to empire. Particular attention is given to Athenian culture of the fifth century B.C. and the unification of the Mediterranean world under Rome.

*Credit—three hours.*  
Three hours a week.  
Spring term.  
Mr. White

221. *The History of England and Greater Britain I.* A historical survey of the development of British civilization from its beginnings to 1685 with the emphasis on England.

*Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.  
Mr. Coates

222. *The History of England and Greater Britain II.* A historical survey of the development of British civilization since 1685, including the development of the Empire and Commonwealth with the emphasis on England.

*Credit—three hours.*  
Three hours a week.  
Spring term.  
Mr. Coates

223. *The History of Canada, 1490-1867.* A general course in Canadian history from the age of discovery until Confederation. Canadian developments are related to those in the United States, Great Britain, and France. Emphasis is given to the establishment of British rule and the evolution of responsible government.

*Credit—three hours.*  
Three hours a week.  
Fall term.  
Mr. M. Wade

224. *The History of Canada, 1867-1959.* A general course in Canadian history from the beginnings of the Dominion until the present day. Canadian developments are related to those in the United States, Great Britain and France. Emphasis is given to the rise of national feeling and relations with the United States.

*Credit—three hours.*  
Three hours a week.  
Spring term.  
Mr. M. Wade

225. *The History of French Canada.* A study of French-Canadian culture, analyzing the evolution of the French traditions in the North American environment. Political, economic, social, and cultural developments will be examined.

*Credit—three hours.*  
Three hours a week.  
Fall term.  
Mr. M. Wade

227. *Seventeenth Century England.* A study of the political, social, economic, religious, and intellectual aspects of English history during a most critical and decisive phase, and in the context of the expanding Western European civilization. The course will begin with the Tudor background of the period. History 221 or 246 prerequisite or by permission of the instructor.

*Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.  
Mr. Coates

229. *The City in American History.* A study of the origins and growth of urbanism in the United States. Special emphasis will be placed on the impact of the city on the economic, political, and cultural development of the nation. The course will also include a discussion of the emergence of urban problems, the rise of the city political machine and boss, the growth of satellite towns and suburbia, and an analysis of urban institutions.

*Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.  
Mr. R. Wade

230. *The History of the American West.* This course will examine the expansion of the American West from the Revolution to the early 20th Century. Special attention will be devoted to the problems of settlement in various western areas and the effect of government policy on the pattern of westward expansion. Emphasis will also be

given to the historiography of the American frontier, focusing on the writings of Frederick Jackson Turner.

*Credit—three hours.*  
Three hours a week.  
Spring term.  
Mr. Lindley

231. *The History of the United States I.* A general history of the United States from 1760 to 1865.

*Credit—three hours.*  
Three hours a week.  
Fall term.  
Mr. R. Wade

232. *The History of the United States II.* A general history of the United States from 1865 to the present.

*Credit—three hours.*  
Three hours a week.  
Spring term.  
Mr. R. Wade

233. *American Economic History I.* An advanced course covering the principal events in the economic life of the United States from the American Revolution to the Civil War.

*Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.  
Mr. Van Deusen

234. *American Economic History II.* An advanced course covering the principal events in the economic life of the United States from the Civil War to the present.

*Credit—three hours.*  
Three hours a week.  
Spring term.

235. *The History of American Foreign Policy I.* A survey of the foreign policy of the United States from 1763 to 1890. The course will include an analysis of the relationship of domestic affairs with foreign policy. Special attention will be paid to the influential ideas that have affected foreign policy formation, the role played by certain prominent public figures, and the significance of changing world patterns as well as their bearing on the problems of the United States in meeting international change.

*Credit—three hours.*  
Three hours a week.  
Fall term.  
Mr. Lindley

236. *The History of American Foreign Policy II.* A survey of the foreign policy of the United States from 1890 to the present. The course will include an analysis of the relationship of domestic affairs with foreign policy. Special attention will be paid to the influential ideas that have affected foreign policy formation, the role played by certain prominent public figures, and the significance of changing world patterns as well as their bearing on the problems of the United States in meeting international change.

*Credit—three hours.*  
Three hours a week.  
Spring term.  
Mr. Lindley.

237. *American Colonial History.* An examination and analysis of the roots of American Civilization to 1789. Emphasis is placed on the interplay between European Expansion in the West and the emergence of a separatist movement in the North American colonies, the problems of the 17th Century American society, the crisis leading to the American Revolution, and the rise of the new American nation.

*Credit—three hours.*  
Three hours a week.  
Spring term.  
Mr. Towle

238. *The Age of Reform in American History 1890-1939.* An historical examination of the reform impulse in a changing American environment. Special attention will be devoted to the interaction of agriculture and industry, the motivating ideas of reform and the men influential in the movement, and its relationship to the emergence of the United States in the world scene.

*Credit—three hours.*  
Three hours a week.  
Fall term.  
Mr. Lindley

239. *The Social History of American Thought I.* This course will deal with the development of American thought to 1865. Special attention will be given to the social background of intellectual currents.

*Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.  
Mr. R. Wade

240. *The Social History of American Thought II.* This course will deal with the development of American thought from 1865 to the present day. Special attention will be given

- to the social background of intellectual currents.
- Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.  
Mr. R. Wade
241. *Medieval Civilization.* A study of the emergence of a European civilization with emphasis upon the fusion of the Graeco-Roman, Christian, and Germanic traditions, and an analysis of the main institutional, artistic, and intellectual contributions of medieval society to the subsequent history of European peoples.
- Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.  
Mr. White
245. *The Renaissance.* Beginning with an analysis of the medieval cultural synthesis of the thirteenth century, this course examines its breakdown and the transition to the modern age, with especial emphasis on the Italian Renaissance.
- Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.  
Mr. White
246. *The Reformation.* A study of Northern Europe during the transition to modern times, with especial emphasis upon the rise of Protestantism, capitalism and the modern state until the end of the Wars of Religion.
- Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.  
Mr. White
251. *The Age of Absolutism and of Reason, 1600-1789.* A study of political, economic, and cultural developments. Special attention is given to the Age of Louis XIV and the Enlightenment.
- Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.  
Mr. Christopher
252. *The Age of Revolution, 1789-1870.* A study of political, economic, and cultural developments. Special attention is given to the era of the French Revolution and Napoleon and to the industrial, political, and intellectual revolutions of the mid-nineteenth century.
- Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.  
Mr. Christopher
253. *France since 1870.* A study of the economic, political, diplomatic, imperial, and cultural developments, concluding with an estimate of the changes resulting from World War II.
- Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.  
Mr. Christopher
255. *Europe 1871-1914.* The development of Europe from the Franco-German War until the First World War.
- Credit—three hours.*  
Three hours a week.  
Fall term.  
Mr. May
256. *Europe Since 1914.* An intensive study of Europe since 1914.
- Credit—three hours.*  
Three hours a week.  
Spring term.  
Mr. May
261. *China Since 1800.* A study of economic, political, social, diplomatic, and intellectual developments from about the beginning of the nineteenth century to the present. Special emphasis will be devoted to China's response to the West and the resulting tensions.
- Credit—three hours.*  
Three hours a week.  
Spring term.  
Mr. Harootunian
262. *Japan Since 1800.* An historical analysis of the economic, political, social, and cultural forces which contributed to Japan's emergence as a modern state.
- Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.  
Mr. Harootunian
265. *A History of Russia I.* An intensive study of imperial Russia with the emphasis on the 19th century and ending with the outbreak of the First World War.
- Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.  
Mr. May
266. *A History of Russia II.* An intensive study of Russia since 1914.
- Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.  
Mr. May

267. *The Middle East in Modern Times.* Attention will be directed mainly to the developments of the past century and a half. Particular stress will be placed on the Young Turk Revolution and its aftermath, the growth of Arab nationalism, the roots of Arab-Israeli tensions, the strategic importance of the Middle East, and the record of attempts to modernize and "Westernize" the middle Eastern states.

*Credit—three hours.*  
Three hours a week.  
Fall term.  
Mr. Christopher

281. *World Communism.* The object of the course is to give the student a dispassionate view of the rise of Communism both as an ideological movement and as a power factor in international relations. The first part of the course will trace the development of Communist ideology. The second section will

deal with the power structure of Communism, with special emphasis on the Soviet Union and Communist penetration into various parts of the world. The third part will deal with the relations of Communism with free societies.

*Credit—three hours.*  
Three hours a week.  
Spring term.  
Mr. R. Wade

291-292. *Intellectual History of the West.* A reading course in the history of western thought from ancient times to the present. The course meets in small discussion sections once a week. Students not concentrating in history will be admitted to this course only by special permission of the instructors.

*Credit—six hours.*  
Time to be arranged.  
Fall through Spring.  
Mr. Christopher, Mr. White





# Mathematics

PROFESSORS GILLMAN, EBERLEIN, JOHNSON, RANDOLPH; Associate Professors GUNDERSON, RAIMI; Assistant Professors CASE, GOBLIRSCH, KENYON, ROTHMAN, SUCHESTON, YEH; INSTRUCTORS LERCHER, SCHROER; Graduate Assistants

A concentration in mathematics consists of courses taken during the junior and senior years in mathematics and an allied field totaling 36 hours, of which 24-30 hours are mathematics courses numbering 200 or over. Senior concentrators attend a weekly seminar in lieu of taking comprehensive examinations.

A freshman or sophomore considering a major in mathematics should consult with the department's concentration adviser about a selection of courses suitable for his ultimate aims.

The records of entering freshmen are examined carefully by the department, and in combination with a placement test given to all freshmen during Freshman Week, determine whether the student taking mathematics will be assigned to Mathematics 100, Mathematics 101, or (under the Advanced Standing Program) Mathematics 150. These assignments are posted late in Freshman Week at the Department of Mathematics, and at Registration. Any student placed in Mathematics 101 who wishes to transfer back to Mathematics 100 may do so before midsemester with the approval of his adviser; The Department of Mathematics need not be consulted.

In the second freshman semester, students from Mathematics 100 may elect Mathematics 101 or Mathematics 105, the latter being a terminal course designed for those not expecting to continue with mathematics. (However, any undergraduate may elect Mathematics 105 as an elective course at any time, for it does not conflict with the calculus sequence in any way.) Students from Mathematics 101 will continue with Mathematics 150.

All other prerequisites listed in the following course descriptions may be waived with the consent of the instructor and the Chairman of the Department of Mathematics.

## A SAMPLE A.B. PROGRAM IN MATHEMATICS

Many concentration programs in mathematics are possible. The sample listed below is designed for the student who, while he may decide to pursue graduate study, expects to enter industry as an applied mathematician after four years. Other sequences would be of interest to the prospective secondary-school teacher, or to the prospective graduate student in mathematics.

### Freshman Year

		HOURS	
		<i>1st Term</i>	<i>2nd Term</i>
Engl. 101, 102	English Composition	3	3
Math. 100, 101	Introductory College Mathematics	4	4
Chem. 123, 124	General Inorganic Chemistry		
or		4	4
Chem. 121, 122	General Chemistry		
Elective	A foreign language	3	3
Elective	Group II	3	3
Phys. Ed.	Physical Education	1	1
		<hr style="width: 100%;"/>	<hr style="width: 100%;"/>
		17	17

### Sophomore Year

Math. 160, 161	Analytical Geometry, Calculus, Differential Equations	4	4
or			
Math. 150, 151	Intermediate Calculus		
Math. 105	Introduction to Finite Mathematics		3
Elective	English or a language	3	
Elective	Physics	4	4
Elective	Group II	3	3
Phys. Ed.	Physical Education	1	1
		<hr style="width: 100%;"/>	<hr style="width: 100%;"/>
		15	15

### Junior Year

Math. 200, 201	Advanced Calculus I & II	3	3
Math. 216	Numerical Methods	3	
Math. 217	Principles of Numerical Analysis		3
Math. 231	Vectors and Matrices	3	
Math. 262	Introduction to Complex Function Theory		3
Elective	Physics, Chemistry or Astronomy	3	3
Elective		3	3
		<hr style="width: 100%;"/>	<hr style="width: 100%;"/>
		15	15

### Senior Year

Math. 210	Introduction to the Theory of Probability and Mathematical Statistics	3	
Math. 211	Topics in the Topics of Probability		3
Math. 270	Linear Differential Equations and Boundary-value Problems	3	
Math. 220	Mathematical Logic	3	
or			
Math. 225	Differential Geometry		3
Electives	Chemistry & Physics recommended	9	9
		<hr style="width: 100%;"/>	<hr style="width: 100%;"/>
		15 or 18	12 or 15

100. *Introductory College Mathematics.* Fundamental aspects of mathematics basic to all future work in the subject are developed; these concepts are used in studying straight lines, polynomials, and simple transcendental curves, and associated topics from algebra and trigonometry.

*Credit—four hours.*  
Four hours a week.  
Fall and spring terms.

101. *Elementary Calculus.* A first course in calculus, in which limits, differentiation, and integration of functions of one variable are developed, together with their geometric and physical applications. Prerequisite: Mathematics 100.

*Credit—four hours.*  
Four hours a week.  
Fall and spring terms.

105. *Introduction to Finite Mathematics.*

This course is preferable to Mathematics 101 for students who intend to take no more than six hours of mathematics. Emphasis is on modern mathematical concepts independent of the calculus; logic, linear algebra, probability. May be taken concurrently with Mathematics 101 or 111. Prerequisite: Mathematics 100 or 110.

*Credit—three hours.*  
Three hours a week.  
Spring term.

110. *Analytic Geometry and Calculus.* Analytic Geometry and Calculus are treated together in such a way that each complements the other.

*Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.

111. *Analytic Geometry and Calculus.* A continuation of Mathematics 110, which is prerequisite.

*Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.

150. *Intermediate Calculus.* Additional topics in the calculus of functions of one variable are studied, including Taylor's series. Prerequisite: Mathematics 101.

*Credit—four hours.*  
Four hours a week.  
Fall and spring terms.

151. *Intermediate Calculus; Differential Equations.* Solid analytic geometry, functions of several variables, multiple integrals. Standard devices for solution of first-order differ-



ential equation. The linear equation with constant coefficients, applications.

*Credit—four hours.*  
Four hours a week.  
Spring term.

160. *Analytic Geometry, Calculus, and Differential Equations.* Mathematics 160 is open only to students who have successfully completed Mathematics 111. Vectors, solid analytic geometry, and functions of several variables.

*Credit—four hours.*  
Four hours a week.  
Fall term.

161. *Calculus and Differential Equations.* A continuation of Mathematics 160. Vector analysis, the complex plane, infinite series, and an introduction to differential equations.

*Credit—four hours.*  
Four hours a week.  
Spring term.

200. *Advanced Calculus I.* Functions of several variables, vector analysis, Stokes Theorem, Green's Theorems. Not for students taking 260 and 261. Prerequisite: Mathematics 151 or 161.

*Credit—three hours.*  
Three hours a week.  
Fall term.

201. *Advanced Calculus II.* Special functions, such as Bessel's and Legendre's, and the gamma function. The Laplace transform, Fourier transform, Fourier's series. Applications. Prerequisite: Mathematics 151 or 161.

*Credit—three hours.*  
Three hours a week.  
Spring term.

210. *Introduction to the Theory of Probability and Mathematical Statistics.* Notions of sample space, combinatorial analysis. Basic probability theorems, binomial, Poisson and normal distributions, DeMoivre-Laplace theorem. Estimation, testing of hypotheses, chi-square test. Prerequisite: Mathematics 151 or 161.  
*Credit—three hours.*  
 Three hours a week.  
 Fall term.
211. *Topics in the Theory of Probability.* Theory of recurrent events, Markov chains, Poisson and other time-dependent processes. Elements of Information Theory. Applications to physical and engineering problems. Prerequisite: Mathematics 151 or 161, and either 210 or some experience in statistics and combinatorial analysis.  
*Credit—three hours.*  
 Three hours a week.  
 Spring term.
216. *Numerical Methods.* Programming and coding for several computer systems. Approximation methods from numerical analysis will be developed, with practice at the Computing Center. Prerequisite: Mathematics 101.  
*Credit—three hours.*  
 Three hours a week.  
 Fall term.
217. *Principles of Numerical Analysis.* Development of the theory of numerical approximations to solutions of transcendental, differential, and partial differential equations. Prerequisite: Mathematics 231 or 236.  
*Credit—three hours.*  
 Three hours a week.  
 Spring term.
218. *An Introduction to the History of Mathematics.* A survey of the development of mathematics from earliest times to the twentieth century, emphasizing the history of elementary mathematics (through calculus). The mathematics itself as well as its history will be stressed by means of problem material. Prerequisite: Mathematics 101 or 110.  
*Credit—three hours.*  
 Three hours a week.  
 Omitted 1960-61.
220. *Mathematical Logic.* A systematic study of the logical foundations of contemporary mathematics. Formal development of the syntax of a standard theory; propositional calculus, quantification theory, identity, and descriptions. Prerequisite, six hours from
- among the following: Mathematics 236, 237, 240, 246, 250, 260, 261.  
*Credit—three hours.*  
 Three hours a week.  
 Fall term.
222. *Axiomatic Set Theory.* A rigorous treatment of the set-theoretic foundations of contemporary mathematics, intended for the general mathematician as well as for the specialist in foundations. Axiomatic development of a system of set theory, formulated as a standard theory: class membership, relations and functions, ordinal and cardinal numbers, axioms of choice. Prerequisite: Mathematics 220 or the equivalent; or consent of the instructor.  
*Credit—three hours.*  
 Three hours a week.  
 Omitted 1960-61.
224. *Mathematical Semantics.* A precise exposition of the relation between standard theories and the mathematical structures which form their models: satisfiability and validity, Gödel's Completeness Theorem; further topics from the theory of models, set-theoretic metamathematics, and related subjects. Prerequisite: Mathematics 220 or the equivalent; or consent of the instructor.  
*Credit—three hours.*  
 Three hours a week.  
 Spring term.
225. *Introduction to Foundations of Mathematics.* An introductory survey of the elementary aspects of the logical and set theoretical foundations of mathematics. Prerequisite: Mathematics 111 or 151.  
*Credit—three hours.*  
 Three hours a week.  
 Omitted 1960-61.
230. *Theory of Equations.* A study of polynomials leads to a study of algebraic equations and their roots. Methods of locating and evaluating roots both exactly and approximately are considered. An introduction to determinant theory follows. Mathematics 111 or 150 prerequisite.  
*Credit—three hours.*  
 Three hours a week.  
 Omitted 1960-61.
231. *Vectors and Matrices.* Basic properties of vectors and matrices, using coordinate methods. Solutions of linear equations, bilinear and quadratic forms, eigenvalues and eigenvectors, and diagonalization of matrices. Emphasis will be placed on those aspects of

- the theory most applicable to physics, statistics and biometrics. Prerequisite: Mathematics 151 or 161. This course is not open to students electing Mathematics 236 and 237.
- Credit—three hours.*  
Three hours a week.  
Fall term.
- 232. Elementary Theory of Numbers.** A study of the properties of divisibility, prime numbers, linear and quadratic congruences, and residues. Mathematics 111 or 150 prerequisite.
- Credit—three hours.*  
Three hours a week.  
Spring term.
- 236. Abstract Algebra I.** Fundamental algebraic structures: groups, rings, fields, modules, and finite dimensional vector spaces. Prerequisite: Mathematics 151 or 161.
- Credit—three hours.*  
Three hours a week.  
Fall term.
- 237. Abstract Algebra II.** Finite dimensional unitary spaces, spectral theory. Field extensions. Prerequisite: Mathematics 236.
- Credit—three hours.*  
Three hours a week.  
Spring term.
- 240. Introduction to General Topology.** This course deals with the notions of topological space, homeomorphism, and continuous mapping. Properties such as compactness, connectedness, and metrizable are studied in detail. Applications are made to analysis through the study of metric spaces. Prerequisite: Mathematics 151 or 161.
- Credit—three hours.*  
Three hours a week.  
Fall term.
- 251. Introduction to Projective Geometry.** Among the subjects considered are foundations, duality, projectivities, collineations, quadrangular sets, conics, projective introduction of coordinate systems, cross ratio, order and continuity, Klein's definition of geometry, affine and metric geometries. Mathematics 111 or 150 prerequisite.
- Credit—three hours.*  
Three hours a week.  
Fall term.
- 255. Differential Geometry.** A vector calculus is introduced and used in developing the classical theory of the differential geometry of curves and surfaces in Euclidean three-dimensional space. Prerequisite: Mathematics 200 or 260 or 270.
- Credit—three hours.*  
Three hours a week.  
Spring term.
- 260. Introduction to Analysis.** This course includes a careful study of the real and complex number systems, and the rigorous development of the fundamental operations of analysis. Prerequisite: Mathematics 151 or 161.
- Credit—three hours.*  
Three hours a week.  
Fall term.
- 261. Theory of Functions.** Further development of the theory of integration and differentiation of real functions, surface integrals, and the Cauchy theory of complex analytic functions. Prerequisite: Mathematics 260.
- Credit—three hours.*  
Three hours a week.  
Spring term.
- 262. Introduction to Complex Function Theory.** A short course in the theory of analytic functions. Cauchy theorems, Laurent Series, calculus of residues, and conformal mappings. Not open to students who elect 260 and 261. Prerequisite: Mathematics 151 or 161.
- Credit—three hours.*  
Three hours a week.  
Spring term.
- 270. Linear Differential Equations and Boundary-value Problems.** Linear systems of ordinary differential equations and classical second-order partial differential equations; eigen-value problems, periodic systems, and other boundary-value problems occurring in applications. Related topics such as expansions in series of orthogonal functions, properties of Fourier series and transforms, and inversion of Laplace transforms are developed as needed. Prerequisite: Mathematics 151 or 161, and some knowledge of matrix techniques and complex variables.
- Credit—three hours.*  
Three hours a week.  
Fall term.
- 271. Non-linear Differential Equations.** General theory of existence of solutions of differential equations; emphasis is on rigorous treatment, but some techniques suitable for numerical analysis are included. Non-linear oscillations and the stability theory of Liap-

nov and Poincaré. Prerequisite: Mathematics 260.

*Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.

290. *Reading Course.* At the discretion of the department chairman, an exceptional undergraduate may arrange with the department for special work with credit.

*Credit to be arranged.*  
Hours to be arranged.  
Fall and spring terms.

446. *Introduction to Real Function Theory.* Function spaces  $L_p$  and  $C$ . Theory of exten-

tion of linear functionals and the Lebesgue and Lebesgue-Stieltjes integrals. Prerequisite: Mathematics 240 and 261, or 240 and concurrent with 261.

*Credit—three hours.*  
Three hours a week.  
Spring term.

463. *Functions of a Complex Variable.* The Dirichlet problem, Riemann mapping theorem, entire and meromorphic functions and allied topics. Prerequisite: Mathematics 261.

*Credit—three hours.*  
Three hours a week.  
Fall term.

## Music

MR. CANNING, DR. FOX, MR. MENNINI, MR. MITCHELL, DR. SUTTON, DR. THOMPSON,  
DR. WATANABE, MR. WHITE, MISS WONDERLICH, DR. WOODBURY.

A synopsis of the courses required for the degree Bachelor of Arts with concentration in Music is given on page 169. All courses in music except Appreciation 101-102, and one section each of Theory 100, 101, 103, 104, and Voice 101, 102 are given at the Eastman School of Music and, with the exception of Appreciation 101-102, are taught by members of the faculty of that School. For information concerning other courses in music, consult the bulletin of the Eastman School of Music.

*Courses at the Eastman School of Music.* An arts student may take work in the Eastman School of Music for credit towards the arts degree. Candidates who wish to take the degree Bachelor of Arts with the major in music must follow the procedures outlined under application procedure for admission, pages 29-32. Other students, who do not wish to make music their principal study, are permitted to elect from courses of college grade offered by the Eastman School of Music to the extent of thirty hours. For the student who desires to major in music, work to the extent of forty-eight to fifty hours is specified in the synopsis below.

The Eastman School of Music will accommodate students registering for individual music instruction, in the order of their registration, reserving the right to close the lists when the limit of the schedules of the teachers of applied music is reached.

Students electing courses in music should first confer with their Faculty Advisers. If the course is approved as an elective, registration should then be made with the Registrar of the Eastman School of Music.

All students from the River Campus who plan to take one or more courses in the Eastman School of Music should take the various tests and auditions given at that school. Applicants for admission in September, 1961, who expect to take music courses should report at the School for these tests and auditions during Freshman Week.

## BACHELOR OF ARTS CURRICULUM WITH A MAJOR IN MUSIC<sup>1</sup>

### Freshman Year

#### Semester Hours

	<i>Sem. I</i>	<i>Sem. II</i>	
Applied Music 113, 114 .....	3	3	Same requirements as B. Mus. in Composition
Theory 100, 101 .....	3	3	
English 101-102 .....	3	3	First-Year Theory Composition Courses at the College of Arts and Science
Electives .....	6	6	
Physical Education .....	1	1	
	32		

### Sophomore Year

Applied Music 123, 124 .....	3	3	
Theory 102, 103 .....	4	4	
Electives .....	9	9	Second-Year Theory Courses at the College of Arts and Science
Physical Education .....	1	1	
	34		

### Junior Year

Applied Music 133, 134 .....	3	3	
Elective .....	3	3	
Electives .....	9	9	History of Music or Theory —Counterpoint 100, 101 recommended. Courses at the College of Arts and Science
	30		

### Senior Year

Applied Music 143, 144 .....	3	3	
Elective .....	2-3	2-3	
Electives .....	9	9	Theory Courses at the College of Arts and Science
	28-30		
	124-126		

Concentration in music may be begun in the sophomore year provided the science requirement has been satisfied in the freshman year. Under this plan forty-two or forty-four hours must be taken at the Eastman School. The prescribed courses in music are the same as those listed above except that only three courses in applied music, as a music major, are required.

<sup>1</sup>If voice is the applied music subject, two hours of work in the Eastman chorus are required each week if a student is taking it as a major and recommended if it is an elective.

OFFERED BY THE COLLEGE  
OF ARTS AND SCIENCE

**Appreciation 101-102.** A course discussing the elements of music, the important masterpieces of that art, and the significant composers from the point of view of the concert-going non-musician. Illustration is done by piano and phonograph, with simultaneous use of scores. Progress is tested by the writing of papers, mid-year and final examinations, and in other ways.

*Credit—six hours.*  
Three hours a week.  
Fall through Spring.  
Mr. Woodbury

OFFERED BY THE EASTMAN  
SCHOOL OF MUSIC

**Theory 100, 101. First-Year Theory.** This course is designed to give a thorough training in the melodic, harmonic, and rhythmic elements of music. The first semester is devoted to the study of the four types of triads, intervals, keys, scales, cadences, notation, rhythmic reading, sight-singing, melodic dictation, and harmonic dictation. New material in the second semester consists of the dominant and supertonic seventh chords, modal scales, key relationships, modulations, transposition by clef, four-part writing, and two-part counterpoint.

*Credit—six hours.*  
Five hours a week.  
Fall through Spring.  
Staff

**Theory 102, 103. Second-Year Theory.** In this course, based on the two-part, three-part, and four-part music of J. S. Bach and his contemporaries, emphasis is placed on analysis, part-writing, practical application at the piano, and on dictation. Harmonic and formal analysis is made of music by K. P. E. Bach, Haydn, Mozart, and Beethoven. Writing includes coral harmonizations, chorale preludes, an invention in two parts, recitatives, piano accompaniments for folk songs, and three-part and four-part vocal arrangements. Prerequisite: Theory 100, 101. Required of music majors; open to other majors with the permission of the instructor.

*Credit—eight hours.*  
Five hours a week.  
Fall through Spring.  
Staff

**Theory 130, 131. Contemporary Styles.** This course, beginning with the style of Wagner

and continuing through the styles of Scriabin, Debussy, and others, is designed to provide training in contemporary harmonic and contrapuntal technics. The second semester deals predominantly with contemporary American composers. Prerequisite: Theory 103.

*Credit—six hours.*  
Three hours a week.  
Fall through Spring.  
Mr. Sutton

**Counterpoint 100, 101. Model Counterpoint.**

A practical study of the medieval modes and the vocal polyphony of the motet and the Mass up to and including five-part writing. One hour each of singing and listening to the ecclesiastical literature of the period is included. Prerequisite: Theory 103.

*Credit—six hours.*  
Three hours a week.  
Fall through Spring.  
Mr. Mitchell, Mr. Sutton, and Mr. White

**Orchestration 200, 201. Fundamentals.** A study of the instruments of the orchestra together with the practical study of the art of symphonic scoring. Prerequisite: Theory 103.

*Credit—four hours.*  
Two hours a week.  
Fall through Spring.  
Mr. Mennini

**History 100, 101. Historical Survey.** A study of the history of music with emphasis on the cultural and general historical background.

*Credit—six hours.*  
Three hours a week.  
Fall through Spring.  
Miss Watanabe

**Music Literature 210, 211. Piano Literature.**

The piano sonata and the other characteristic forms, from the pre-piano period to the present time. Intended particularly for students majoring in piano, composition, or the history of music. Outside listening required.

*Credit—four hours.*  
Two hours a week.  
Mr. Thompson

**Ensemble 101. Chorus.** A class for the study of a *cappella* literature and larger works for chorus and orchestra. Required of voice majors and recommended if voice is studied as an elective.

*No credit.*  
Two hours a week.  
Fall and spring terms.  
Mr. Genhart



## Naval Science

Captain CALLAHAN (USN); Commander PROUHET (USN); Major GLEASON (USMC); Lieutenant Commander CONN (USN); Lieutenants BROWN (USN), JUIF (USNR); Chief Petty Officers COOPER, OWNBY, LAUFENBERG and LUKSICH; Petty Officer First Class FLOYD; Gunnery Sergeant GARR.

Requirements for the Naval Reserve Officers Training Corps will be found on pages 77-79.

101. *Naval Orientation.* A study of the basic customs and traditions of the Navy, and of the functions of the Naval Establishment and its components in the defense of the nation; an introduction to the duties and responsibilities of a line officer in the Naval Service.

*Credit—three hours.*

Three lecture-recitations.

One two-hour practical instruction period a week.

Fall term.

102. *Evolution of Sea Power.* A study of the influence of Sea Power upon global history in general, and upon the world balance of power in particular, with especial reference to the role of Sea Power in maintaining the peace.

*Credit—three hours.*

Three lecture-recitations.

One two-hour practical instruction period a week.

Spring term.

151. *Naval Weapons.* The development of an understanding of the fundamentals of naval weapons and weapons systems, stressing basic principles, and their application to control of the seas.  
*Credit—three hours.*  
 Three lecture-recitations.  
 One two-hour practical instruction period a week.  
 Fall term.
221. *Naval Machinery Nuclear Power and Ship Stability.* Basic principles relating to the transformation of energy from fuel, including nuclear fuel, to heat to power. The application of steam, internal combustion and other prime movers to propulsion and auxiliary uses in Naval vessels and aircraft. A study of the principles of ship stability and buoyancy and their application to the problems of damage control.  
*Credit—three hours.*  
 Three lecture-recitations.  
 One two-hour practical instruction period a week.  
 Fall term.
222. *Navigation.* A study of the theory and techniques of the art of navigation, including dead-reckoning, piloting, electronic and celestial navigation.  
*Credit—three hours.*  
 Three lecture-recitations.  
 One two-hour practical instruction period a week.  
 Spring term.
231. *Naval Operations.* A study of naval operations in general at the junior watch officer level, including rules of the nautical road, OOD and CIC operational duties, and maneuvering board. Capabilities, restrictions, and security of naval communications. Radar navigation, polar operations and operational meteorology.  
*Credit—three hours.*  
 Three lecture-recitations.  
 One two-hour practical instruction period a week.  
 Fall term.
232. *Principles and Problems of Naval Leadership.* A study of the principles and problems of human relations, the principles of management, and the responsibilities of the junior officer in his role as a Division Officer. This course includes such topics as concepts of leadership; principles of interviewing; the functions of management; recent developments in management; concept of command; the Uniform Code of Military Justice; and other similar topics.  
*Credit—three hours.*  
 Three lecture-recitations.  
 One two-hour practical instruction period a week.  
 Fall term.
235. *Naval Auxiliary Machinery, Nuclear Power and Ship Stability.* This course is open only to seniors majoring in engineering. The course is designed to apply the principles of engineering to the main propulsion plants of naval vessels. A study of nuclear power is included. In addition the course covers ship stability and buoyancy as they apply to damage control.  
*Credit—one hour.*  
 One lecture-recitation.  
 One two-hour practical instruction period a week.  
 Fall term.
261. *Evolution of the Art of War.* A study of the classic principles, tactics, and techniques of land warfare and their development.  
*Credit—three hours.*  
 Three lecture-recitations.  
 One two-hour practical instruction period a week.  
 Fall term.
262. *Modern Basic Strategy and Tactics.* Modern military tactical principles and techniques, especially on the small unit level, and development of a general understanding of strategy.  
*Credit—three hours.*  
 Three lecture-recitations.  
 One two-hour practical instruction period a week.  
 Spring term.
271. *Amphibious Warfare.* A study of the concept, history, development and techniques of amphibious warfare, including a critical analysis of selected amphibious operations.  
*Credit—three hours.*  
 Three lecture-recitations.  
 One two-hour practical instruction period a week.  
 Fall term.
272. *Naval Justice and Leadership.* The principles and techniques of leadership. The administration of naval justice.  
*Credit—three hours.*  
 Three lecture-recitations.  
 One two-hour practical instruction period a week.  
 Spring term.

# Non-Western Civilization

*The requirements for the concentration in Non-Western Civilizations include the course described below and other courses to be chosen from the list on page 89.*

**201-202. Introduction to Non-Western Civilizations.** A broad survey of the Soviet Union and of the principal areas of the Middle East, Asia, Africa and Latin America, with particular emphasis on their political, economic and social developments viewed in historical perspective, and on their contemporary problems.

*Credit—six hours.*

Three hours a week.

Fall through Spring.

Mrs. Dean, Mr. Harootunian and others

**203. Oriental Humanities.** A selective survey of the arts, literature, and philosophies of India, China and Japan. This course is intended to acquaint the student with the artistic and cultural traditions of those great oriental societies which have a rich ancient heritage and which still play a vital role in the world today.

*Credit—three hours.*

Three lectures a week.

Fall term.

Mr. Dohanian

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## The Courses in Optics

PROFESSORS HOPKINS (on leave), DEXTER (on leave, Term I), GIVENS (on leave).

\*KINGSLAKE, Visiting Professor INGELSTAM; Associate Professors \*BOYNTON,

EVANS, STEWART, WOLF; Assistant Professors BAUMEISTER, \*KNOX, Visiting

Assistant Professor MANDEL; Senior Research Associates and

\*Assistant Professors BLAKNEY, MILNE; Senior Research Associates

DUTTON, PESKIN, TEEGARDEN; Research Associate and \*Assistant

Professor EYER; Research Associates BALDINI, KAYE, MURTY,

NAKAI; \*Lecturers CARPENTER, EWALD, PERRIN, TUTTLE.

The Courses in Optics lead to the degree Bachelor of Science with a Major in Optics. They are offered by the Institute of Optics to students who wish to prepare themselves for industrial and research positions in optical physics or optical engineering. In this, the Institute has the cooperation and interest of the optical and related industries. These courses offer extensive training in geometrical, physical and physiological optics with an opportunity for specialization in such subjects as photography, spectroscopy, polarized light, optical and mechanical design of instruments, colorimetry, spectrophotometry and optical properties of thin films. The curricula include basic courses in mathematics, chemistry and physics and electives in other fields.

\*Part-time.

## B.S. DEGREE IN OPTICS

### Freshman Year

		HOURS	
		<i>1st Term</i>	<i>2nd Term</i>
Engl. 101, 102	English Composition	3	3
Math. 100, 101	Introductory College Mathematics, Elementary Calculus	4	4
Phys. 107-108* or Phys. 101-102	Physics I		
Chem. 121, 122	General Physics A	4	4
Optics 101, 102	General Chemistry	4	4
Phys. Ed.	Introduction to Optics	1	1
	Physical Education	1	1
		<hr style="width: 100%; border: 0.5px solid black;"/>	<hr style="width: 100%; border: 0.5px solid black;"/>
		17	17

### Sophomore Year

Math. 150, 151 or Math. 160, 161	Intermediate Calculus, Differential Equations	4	4
Phys. 117-118 or Phys. 111-112*	Analytical Geometry, Calculus, Differential Equations		
Engl. 103, 104	Physics II	4	4
Engr. ME 104†	General Physics B	3	3
Mod. Lang. Elective	Introduction to Literature	3	3
Phys. Ed.	Machine Shop (taken during Freshmen Week)	2	2
	Modern Language Elective	3	3
	Group II	3	3
	Physical Education	1	1
		<hr style="width: 100%; border: 0.5px solid black;"/>	<hr style="width: 100%; border: 0.5px solid black;"/>
		20	18

### Junior Year

Optics 161	Electromagnetic Waves	3	3
Optics 162	Physical Optics I	3	3
Optics, 141, 142 Elective	Geometrical Optics I and II	3	3
Elective	Group I or II	3	3
Physics 213	Mathematics	3	3
Elective	Introduction to Modern Physics	3	3
	Group III	3	3
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		15	15

### Senior Year

Optics 261, 262	Physical Optics II and III	3	3
Optics 253, 254	Radiometry and Spectrophotometry I and II	3	3
Optics 152	Physiological Optics	3	3
Optics 223	Electronic Properties of Solids	3	3
Elective	Group I or II	3	3
Elective	Group III	3	3
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		15	15

\*The choice of the physics course sequence depends on the preparation of the individual student and is decided in consultation with the Student's Faculty Advisor.

†Students with previous experience may be excused from this requirement.

**101. Introduction to Optics I.** A survey of optics and optical engineering, and introduction to elementary principles of optical instrument design. Through orientation lectures given by various members of the staff, the student is introduced to a number of areas of current interest in optics. The orientation lectures form in a sense a "preview" of the Optics curriculum, and provide a basis of information on which the student may more wisely plan his studies and subsequent work in optics.

*Credit—one hour.*  
One lecture a week.  
Fall term.

**102. Introduction to Optics II.** The student is introduced to elementary principles of design, particularly mechanical design and applied descriptive geometry, with laboratory work involving design and drawing of mechanical parts of optical instruments.

*Credit—one hour.*  
One lab a week.  
Spring term.

**141. Geometrical Optics I.** The principles of refraction, reflection, image translation and rotation by systems of lenses and prisms are treated by vector and matrix methods. Skew ray formulae for reflection and refraction at curved surfaces are derived together with a differential form to show the natural development of the concept of paraxial rays. The course primarily is devoted to the Gaussian optics of optical systems. Third order image theory and modern image evaluation methods are briefly discussed. The laboratory consists of experiments which illustrate fundamental geometrical optics principles and procedures for testing such optical systems as telescopes, interferometers, photographic lenses, spectrometers, and refractometers. Physics 111-112 and Mathematics 150-151 are prerequisite.

*Credit—three hours.*  
Two lectures, one lab a week.  
Fall term.

**142. Geometrical Optics II.** A continuation of Optics 141.

*Credit—three hours.*  
Two lectures, one lab a week.  
Spring term.

**152. Physiological Optics.** A survey of the fundamentals of the visual process, including light as the visual stimulus, the eye as the optical system, photoreception, transmission of information through the visual system, visual sensation and resulting be-

havior. The characteristics of the total visual system as a light-sensing device will be stressed. Physics 101-102 and Mathematics 100, 101 are prerequisites.

*Credit—three hours.*  
Three lectures a week.  
Spring term.

**161. Electromagnetic Waves.** The equations which describe the propagation of light and other electromagnetic radiation are derived from the basic laws of electricity and magnetism. A mathematical treatment is given to the behavior of light waves. Physics 111-112 is prerequisite. Although some of the mathematical background is developed, Mathematics 150 is a prerequisite or should be taken concurrently.

*Credit—three hours.*  
Three lectures a week.

**162. Physical Optics I.** An introduction is given to the phenomena of image formation, interference, diffraction, polarization and scattering. Physics 111-112 or Physics 221, Optics 161 and Mathematics 150-151 are prerequisites.

*Credit—three hours.*  
Two lectures, one lab a week.  
Fall term.

**223. Electronic Properties of Solids.** Selected topics in solid-state physics and physical electronics. The subjects considered include energy band theory of solids, conduction in solids, thermionic and photoelectric emission, gaseous electronic conduction, semiconductors, dielectrics, crystalline imperfections, luminescence, photoconductivity, and others. Physics 213 or Physics 241 is prerequisite.

*Credit—three hours.*  
Three lectures a week.  
Spring term.

**225. Introduction to the Theory of the Solid State.** The purpose of the course is to introduce the fundamental concepts of solid state physics and acquaint the student with the terminology employed in this important branch of physics. The mathematical details will be kept to a minimum. Particular attention will be given to the electron motions in the solid and the effect of these motions on the physical properties of the solid. Special emphasis will be given to the optical properties of solids. Two years college physics and two years college mathematics are prerequisite. Given in University School.

*Credit—three hours.*  
Three lectures a week.  
Fall term.

251. **Advanced Physiological Optics.** A detailed discussion of selected topics pertaining to the visual process. Optics 152 or permission of the instructor prerequisite.

*Credit—three hours.*  
Three lectures a week.  
Fall term.

252. **Colorimetry.** A course dealing with the chromatic sensations, color theory, the measurement and specification of color, and the quantitative consideration of color vision. Physics 111-112 is prerequisite.

*Credit—three hours.*  
Two lectures, one lab a week.  
Spring term.

253. **Radiometry and Spectrophotometry I.** A course dealing with the theories and the techniques involved in radiometric measurements. Particular attention will be given to errors in experimental results, sources of noise and the practical and theoretical limitations of radiation detectors. Special topics relating to radiometric and photometric problems encountered in physics and astronomy will be discussed. Physics 213 or equivalent is prerequisite.

*Credit—three hours.*  
Two lectures, one lab a week.  
Fall term.

254. **Radiometry and Spectrophotometry II.** The instruments used for spectrophotometry will be studied with emphasis on the practical and theoretical limits to sensitivity, resolution and range. Special topics in infrared techniques of detection will be discussed in terms of the spectral characteristics of the sources, the atmosphere and the components of the detectors.

*Credit—three hours.*  
Two lectures, one lab a week.  
Spring term.

257. **Technical Photography.** An introductory course in the technical and scientific aspects of photography; photographic equipment and materials; photographic sensitometry; exposure and exposure devices; light sources; characteristics of developers and other processing solutions; tone reproduction; methods of color photography. (Two years college physics prerequisite.) Given also in University School.

*Credit—three hours.*  
Two-hour lecture, one three-hour lab a week.  
Fall term.

258. **Physics of Photography.** Latent image theory; mechanism of development; special exposure and development phenomena; physics of the developed photographic image; photographic photometry; photography with ultraviolet, infrared, x-ray, and nuclear particle radiation; analysis of subtractive color processes. Optics 257 is prerequisite. There is no formal laboratory, but a term paper or term project is required. Given in University School.

*Credit—three hours*  
One two-hour lecture a week.

261. **Physical Optics II.** The following subjects are treated by classical electromagnetic theory; propagation, reflection and refraction of light, optical properties of metals, and optical dispersion. Optics 162 is prerequisite.

*Credit—three hours.*  
Three lectures a week.  
Spring term.

262. **Physical Optics III.** The course covers the Kirchoff treatment of diffraction and the application of the Fourier transform to practical diffraction problems. The propagation of waves in anisotropic (i.e., crystalline) media is also treated. Optics 261 is prerequisite.

*Credit—three hours.*  
Two lectures, one lab a week.  
Fall term.

263. **Polarized Light.** The theory of the propagation of light in doubly refracting media; detection and measurement of plane and elliptical polarization; applications to petrography, photoelasticity, and polarimetry. Given in University School.

*Credit—three hours.*  
Two lectures, one three-hour lab a week.



**265. Applied Spectroscopy and Interferometry.**

Origin of spectra; classification and intensities of spectral lines; methods of exciting spectra of various types. The design, calibration and use of grating and prism spectrographs and interference spectroscopes. Spectrochemical analysis. Two years college physics prerequisite. Given in University School.

*Credit—three hours.*

Two lectures, one three-hour lab a week.

**283. Mechanical Design of Optical Instruments I.**

A study of components and applications of optical instruments. Engineering of optical systems such as condensers, relays, visual and photoelectric instruments, timing, projection, and range finding systems. Principles of mechanical design including in-

strument engineering, kinematics, precision mechanisms, tolerances and materials. Laboratory experiments and analysis of finished instruments. (Two years college physics prerequisite.) Given in University School.

*Credit—three hours.*

Two lectures, one lab a week.

Fall term.

**284. Mechanical Design of Optical Instruments II.**

A continuation of Optics 283.

*Credit—three hours.*

Two lectures, one lab a week.

Spring term.

**293. Special Problems in Optics.**

A reading or research course open to seniors in optics by special permission.

*Credit to be arranged.*

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# Philosophy

PROFESSOR BECK; ASSOCIATE PROFESSORS STOLNITZ, TURBAYNE; ASSISTANT PROFESSOR STEWART; ASSOCIATES.

Students concentrating in Philosophy may, with the approval of the Department and the Division of Honors Studies, include in their programs of concentration one or more Honors Seminars, normally to be taken in the senior year. For Honors Seminars in Philosophy see page 108.

Colloquia for all students concentrating in philosophy are held throughout the academic year. These colloquia are planned so as to help the students to integrate the knowledge and skills gained in their several courses and to prepare them for the comprehensive examination.

Philosophy 101, 102 are among the courses meeting the Group II requirements for the A.B. degree (cf. p. 84). Philosophy 252 meets the comprehensive examination requirement for students in the General Science program.

## A SAMPLE A.B. PROGRAM IN PHILOSOPHY

### Freshman Year

		HOURS	
		<i>1st Term</i>	<i>2nd Term</i>
Engl. 101, 102	English Composition	3	3
Phil. 101*	Introduction to Philosophy	3	
Philo. 102*	Ethics		3
Hist. 101-102	Introduction to Contemporary Civilization	3	3
Biol. 101-102	General Biology		
or		4	4
Phys. 101-102	General Physics A		
Germ. 101-102	Elementary German		
or		3	3
French 101-102	Elementary French		
Phys. Ed.	Physical Education	1	1
		<hr/>	<hr/>
		17	17

### Sophomore Year

Engl. 103, 104	Introduction to Literature	3	3
or			
Engl. 111-112	Survey of English Literature		
Germ. 103-104	Introduction to German Civilization		
or		3	3
French 103-104	Introduction to French Civilization		
Psych 101-102	Introduction to Psychology		
or		3 or 4	3 or 4
Math. 100, 101	Introductory College Mathematics, Elementary Calculus		
Phil. 103*	History of Ancient Philosophy	3	
Phil. 104*	History of Modern Philosophy		3
Phil. 107*	Logic		3
or		3	
Phil. 216*	Formal Logic	3	
Elective	Group II	3	3
		<hr/>	<hr/>
		15-19	15-19

### Junior Year<sup>1</sup>

Phil. 205	Recent and Contemporary Philosophy	3	
Phil. 221	Ethics and Society		3
Phil. 252	Philosophy of Science		3
Electives		12	9
		<hr/>	<hr/>
		15	15

### Senior Year<sup>1</sup>

Phil. 211	Philosophy of Religion	3	
Phil. 241	Aesthetics		3
Electives		12	12
		<hr/>	<hr/>
		15	15

\*Required of majors in Philosophy.

<sup>1</sup>It is strongly recommended that students preparing for graduate and professional work in Philosophy enter the Honors Program at the beginning of the third year.

Students planning to enter graduate school for advanced work in philosophy should study both French and German; if their interest is in logic, work in mathematics is especially recommended.

Students who do not go into the Honors Division should take, during their last two years, the following courses in Philosophy 205, 221, 252, 211, and 241 (or 244) and/or one or more honors seminars. The remainder of the program should be made up of advanced courses (and their prerequisites) in any field or fields of interest to the students. Depending upon the student's interests and professional plans, programs can be arranged comprising courses in almost any other department in the College of Arts and Science.

101. *Introduction to Philosophy.* Critical examination of some of the central beliefs and methods of thinking in common sense, science, and religion. Such topics as: the existence and nature of God, why is knowledge gained by the scientific methods reliable? Can science decide questions of value? Classroom discussion and conference sections.

*Credit—three hours.*  
Three hours a week.  
Fall term.

Mr. Stolnitz, Mr. Turbayne, associates

102. *Ethics.* Examination of the principles of duty and right conduct which are applied in making moral choices, and of the leading conceptions of the good life in ethical philosophy. The religious, psychological, sociological, and philosophical approaches to morality contrasted. Moral conflict in literature, the drama, and everyday life. Classroom discussion and conference sections.

*Credit—three hours.*  
Three hours a week.  
Spring term.

Mr. Beck, Mr. Stolnitz, associates

103. *History of Ancient Philosophy.* An introduction to ancient philosophy through a study of important philosophers from the sixth century B.C. to the third century A.D., and of their significance for the problems of today. Readings in the Pre-Socrates, Plato, Aristotle, the Stoics, and the Epicureans.

*Credit—three hours.*  
Three hours a week.  
Fall term.  
Mr. Beck

104. *History of Modern Philosophy.* An introduction to modern philosophy through a study of important philosophers from the seventeenth to the nineteenth centuries, and of their position in the cultural history of the West.

*Credit—three hours.*  
Three hours a week.  
Spring term.  
Mr. Turbayne

107. *Logic.* An elementary course in the methods and rules of thinking correctly, of avoiding common fallacies, and of effectively organizing information. Practical applications of basic logic, semantics, and scientific methods.

*Credit—three hours.*  
Three hours a week.  
Spring term.  
Mr. Stewart.

205. *Recent and Contemporary Philosophy.* A study of several of the most influential philosophers of the nineteenth and twentieth centuries; an introduction to contemporary views in philosophy. Prerequisite: Philosophy 104 or permission of the instructor.

*Credit—three hours.*  
Three hours a week.  
Fall term.  
Mr. Stewart

*Interrelations of Art, Literature and Philosophy.* (See Fine Arts 215, 216)

211. *Philosophy of Religion.* A critical and systematic study of the main problems of religious thought today, such as the existence of God, religious knowledge, and the relation of religion and culture.

*Credit—three hours.*  
Three hours a week.  
Spring term.  
Mr. Turbayne

216. *Formal Logic.* An investigation of the methods and techniques of symbolic logic. A study of the conceptual tools required for the analysis of the foundations of mathematics or for any rigorous analysis of deductive systems. Special attention will be given early in the course to the precise formulation of statements of everyday language in symbolic terms.

*Credit—three hours.*  
Three hours a week.  
Fall term.  
Mr. Stewart

221. *Ethics and Society.* The application of ethical theory to concrete problems of moral choice in society. The relation between morality and the law, the theory of punishment, the nature of human "rights". Moral analysis of specific decisions in government and the law which have been of historic importance. Prerequisite: Philosophy 102.

*Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.  
Mr. Stolnitz

237. *Contemporary Social and Political Philosophy.* An introduction to the fundamental philosophical ideas implicit in contemporary discussions of social and political order, causation, knowledge, and value. A critical examination of the philosophical structure of Marxism, the theory of democratic institutions, and the fascistic critique

of both Marxist and non-Marxist theories of democracy.

*Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.

241. *Aesthetics.* Examination of the experience of appreciating beauty, both in nature and art; critical analysis of leading theories of the creation of art and the structure and value of works of art, e.g., formalism, expressionism, religious and moral influence; the semantic problem of the "meaning" of art, particularly the difference between scientific and poetic uses of language. Concrete reference to specific works of art in the various media—painting, music, poetry, drama, etc.

*Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.  
Mr. Stolnitz

244. *The Philosophy of Criticism.* Examination of the meaning of value-judgments in the arts; whether and by what means such judgments can be confirmed; the problems of "good taste". Analysis of the validity and scope of the principles employed in criticism of the arts, including literature. Readings in critical texts and application to specific works of art.

*Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.  
Mr. Stolnitz

252. *Philosophy of Science.* An examination of scientific definitions and postulates, the functions and structure of theories, the nature of causal and statistical explanation, and the role of mathematics in science. Special emphasis will be placed on actual scientific systems in both the physical sciences and the social sciences.

*Credit—three hours.*  
Three hours a week.  
Spring term.  
Mr. Stewart

*Mathematical Logic.* (See Mathematics 220)

*Axiomatic Set Theory.* (See Mathematics 222)

*Mathematical Semantics.* (See Mathematics 224)



282. *The Organization of Knowledge.* A study, both historical and philosophical, of the basic presuppositions underlying the natural and social sciences, the humanities, and religion, their bearing upon each other, and their implications for man's conception of himself and of his place in the world.

*Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.

291. *Reading Course.* The reading of philosophical literature under guidance. This course is planned primarily in the interest of seniors majoring in philosophy, and other students may register only with the consent of the chairman of the Department of Philosophy.

*Credit—two or three hours.*  
Staff



## Physical Education for Men

PROFESSORS ALEXANDER, BITGOOD, BURNHAM, SPEEGLE; ASSOCIATE PROFESSOR BROWN; ASSISTANT PROFESSOR SMITH; INSTRUCTORS OCORR, PHILLIPS.

The aim of the department is to provide physical activity and recreation for the students, to stimulate interest in a wide variety of individual and team games, encourage participation in intramural and intercollegiate athletics, and stress in the required program the games and sports that have a high carry-over value for after class hours as well as after college years.

**101. Physical Education I.** Required of all freshmen. Instruction is provided in swimming, tennis, handball, basketball, softball, track, volleyball, wrestling, soccer, tumbling, and apparatus.

*Credit—one hour.*  
Three hours a week.  
Fall term.  
Staff

**103. Physical Education II.** A continuation of Physical Education 101.

*Credit—one hour.*  
Three hours a week.  
Spring term.  
Staff

**111. Physical Education I.** Required of all

sophomores. Each student must demonstrate satisfactory ability in handball, tennis, squash racquets, and swimming. More advanced instruction is provided in the above activities as well as the following: basketball, softball, track, volleyball, wrestling, soccer, golf and badminton.

*Credit—one hour.*  
Three hours a week.  
Fall term.  
Staff

**113. Physical Education II.** A continuation of Physical Education 111.

*Credit—one hour.*  
Three hours a week.  
Spring term.  
Staff

# Physical Education for Women

Professor SPURRIER; Assistant Professor FABRICANT; INSTRUCTORS MOEHLKAMP,  
\*MASON, \*SANDERS, VAN WAGENEN.

The aim of the department is to present a program that will develop an appreciation of the value of intelligent participation in motor activity; to teach skills and encourage interest in these activities; to direct an intramural program, which includes a wide variety of interests; to promote the maintenance of good health habits.

Three hours a week are required during the freshman and sophomore years. Each girl buys a regulation costume and provides her own tennis racquet. Other equipment is furnished. The activities are taught for a period of eight weeks during four seasons: Fall, Winter I, Winter II, and Spring.

102. *Physical Education I.* Each girl is required to take a season of fundamentals of movement or an introductory course in rhythm; a safety proficiency swimming test is given. Those who do not qualify are expected to enroll for one season of swimming. Activities for remaining seasons are elective.

*Credit—one hour.*  
Three periods a week.  
Fall term.  
Staff

104. *Physical Education II.* A continuation of 102.

*Credit—one hour.*  
Three hours a week.  
Spring term.  
Staff

112. *Physical Education I.* Each girl is expected to enroll for one season of instruction in a sport if it was not elected during her freshman year. Activities for the remaining

seasons are elected from the following:

Fall: Archery, field hockey, modern dance, soccer, swimming, tennis.

Winter: Badminton, basketball, diving, modern dance, skiing, swimming, trampoline, volleyball.

Red Cross Life Saving is offered.

*Credit—one hour.*  
Three periods a week.  
Fall term.  
Staff

114. *Physical Education II.* A continuation of 112.

Spring: Archery, diving, golf, Lacrosse, modern dance, softball, swimming, tennis.

Water Safety Instructor's Course is offered.

*Credit—one hour.*  
Three hours a week.  
Spring term.  
Staff

\*Part-time.



# Physics and Astronomy

Professors MARSHAK (on leave), BARNES, \*DEXTER (on leave, Term II), FRENCH, FULBRIGHT, KAPLON (Acting Chairman); Associate Professors ALFORD, CHILDS, GOEBEL, HAFNER, SAVEDOFF, TINLOT, \*WOLF; Senior Research Associate HEER; Assistant Professors BILANIUK, HELFER, KNOX, \*KEENAN, MELISSINOS, SUDARSHAN, WARNER; Research Associate and \*Assistant Professor BIRULA; Instructors FAZIO, KLARMANN, Research Associate and \*Instructor SCHNITZER; Research Associates CZIFFRA, GOTOW, SKUMANICH, YAMANOUCHI; Technical Associate and Director of Research Budgets and Services MORTENSON; Technical Associates DUNGAN, HAMANN, HAWRYLAK; Executive Secretary JAMISON.

The Department of Physics and Astronomy offers programs leading to the A.B. and B.S. degrees in Physics and Astrophysics. The Astrophysics program is described on page 186. The Department also makes available a choice between two introductory sequences in physics for students in related fields, and offers several additional upperclass courses that are attractive to non-specialists.

A student entering a physics program must have high standing in his preparatory courses in science and mathematics. In particular, he should have begun a study of calculus or be prepared to begin it in his first college term. His enrollment in a physics program is subject to the approval of the Chairman of the Department or his representative. Such approval is granted to a B.S. candidate at the beginning of his Freshman year, and to an A.B. candidate at the beginning of his Junior Year. Upon entering the College, students are screened by the Department in order to assign them to the appropriate introductory course. A conscientious effort is made to scrutinize the progress of all students in these courses, and to facilitate early transfers from one to the other when such a move is evidently in the interest of the student concerned.

The Department offers continuing advice to each of its upperclass students, bearing in mind his plans for the future. The program for the Junior and Senior years may be varied to give the training in physics, mathematics, and related fields that seems most appropriate for each student. Physics 221-222 and Mathematics 200 and 201 are required of all students. Physics 231-232 and 241-242, and Mathematics 260 and 261 are strongly recommended for students planning to pursue graduate study.

A typical concentration leading to the A.B. in Physics is given below. It should be regarded as a minimum program in physics and mathematics, and should be supplemented by at least one additional upperclass course in each field if it is to serve as adequate preparation for graduate study. The program leading to the B.S. in Physics is less flexible, but nevertheless provides a reasonable opportunity for a student to avoid overspecialization.

\*Part-time.

## SAMPLE A.B. PROGRAM IN PHYSICS

### Freshman Year

		HOURS	
		<i>1st Term</i>	<i>2nd Term</i>
Phys. 107-108	Physics I	4	4
or			
Phys. 101-102	General Physics A	4	4
Math. 100, 101	Introductory College Mathematics	3	3
Engl. 101, 102	English Composition	4	4
Chem. 123, 124	General Inorganic Chemistry	1	1
Phys. Ed.	Physical Education	1	1
		<hr style="width: 100%;"/>	<hr style="width: 100%;"/>
		16	16

### Sophomore Year

Phys. 117-118	Physics II	4	4
or			
Phys. 111-112	General Physics B	4	4
Math. 160, 161	Differential Equations	4	4
or			
Math. 150, 151	Intermediate Calculus	3	3
Engl. 103, 104	Introduction to Literature	3	3
Elective	Modern foreign language	3	3
Elective	Group II	3	3
Phys. Ed.	Physical Education	1	1
		<hr style="width: 100%;"/>	<hr style="width: 100%;"/>
		18	18

### Junior Year

Phys. 230	Thermodynamics	3	
Phys. 162	Physical Optics I	3	3
Math. 200, 201	Advanced Calculus	3	3
Elective	Group I	3	3
Elective	Group II	3	3
Elective		3	3
		<hr style="width: 100%;"/>	<hr style="width: 100%;"/>
		15	15

### Senior Year

Phys. 221-222	Electricity and Magnetism	3	3
Math. 260, 261	Analysis	3	3
or			
Math. 236, 237	Abstract Algebra	3	3
or			
Math. 216, 217	Numerical Methods	3	3
Elective	Group II	3	3
Elective	Group III	3	3
Elective		3	3
		<hr style="width: 100%;"/>	<hr style="width: 100%;"/>
		15	15

## B.S. IN PHYSICS

### Freshman Year

		HOURS	
		<i>1st Term</i>	<i>2nd Term</i>
Phys. 107-108	Physics I	4	4
Math. 100, 101	Introductory College Math	4	4
Engl. 101, 102	English Composition	3	3
Chem. 123, 124	General Inorganic Chemistry	4	4
Phys. Ed.	Physical Education	1	1
		<hr/>	<hr/>
		16	16

### Sophomore Year

Phys. 117-118	Physics II	4	4
Math. 160, 161	Differential Equations	4	4
Engl. 103, 104	Introduction to Literature	3	3
Elective	Group II	3	3
Elective	Modern Foreign Language	3	3
Phys. Ed.	Physical Education	1	1
		<hr/>	<hr/>
		18	18

### Junior Year

Phys. 221-222	Electricity & Magnetism	3	3
Phys. 224	Introductory Electronics	3	
Phys. 230	Thermodynamics	3	
Physics 162	Physical Optics I		3
Math. 200, 201	Advanced Calculus	3	3
Elective	Group I	3	3
Elective	Group II	3	3
		<hr/>	<hr/>
		18	15

### Senior Year

Phys. 283-284	Senior Laboratory	3	3
Two of:			
Phys. 231-232	Classical Physics		
Phys. 241-242	Modern Physics	6	6
Math. 260, 261	Analysis		
EE 240, 241	Electronics		
Electives		6	6
		<hr/>	<hr/>
		15	15

The Course in Astrophysics has been introduced primarily to provide training for those students considering graduate work in Astronomy, Astrophysics or related subjects. The course of study contains sufficient training in Physics so that election of this degree does not exclude the student seeking employment or further education in Physics. Enrollment in this course is restricted to students of high standing in Science and Mathematics. The Freshman and Sophomore courses are identical with the Course in Physics. Those students carrying the Course in Physics must elect the Astrophysics program during their Junior Year. For further information consult the Chairman of the Department or his representative for Astrophysics.

## B.S. IN ASTROPHYSICS

### Freshman Year

		HOURS	
		<i>1st Term</i>	<i>2nd Term</i>
Engl. 101, 102	English Composition	3	3
Math. 100, 101	Introductory College Math	4	4
Physics 107-108	Physics I	4	4
Chem. 123, 124	General Inorganic Chemistry	4	4
Phy. Ed.	Physical Education	1	1
		<hr style="width: 100%;"/>	<hr style="width: 100%;"/>
		16	16

### Sophomore Year

Math. 160, 161	Analytic Geometry, Calculus and Differential Equations	4	4
Phys. 117-118	Physics II	4	4
Engl. 103, 104	Introduction to Literature	3	3
Elective	Group II	3	3
Elective	Modern Foreign Language	3	3
Phy. Ed.	Physical Education	1	1
		<hr style="width: 100%;"/>	<hr style="width: 100%;"/>
		18	18

### Junior Year

Ast. 203	Solar System		3
Math. 200, 201	Advanced Calculus	3	3
Physics 162	Physical Optics I	3	
Physics 221-222	Electricity and Magnetism	3	3
Physics 230	Heat and Thermodynamics		3
Elective	Group I	3	3
Elective	Group II	3	3
		<hr style="width: 100%;"/>	<hr style="width: 100%;"/>
		15	18

### Senior Year

Ast. 203	Stellar Astronomy	3	
Ast. 204	Introduction to Astrophysics		3
Phys. 231-232	Introduction to Classical Physics	3	3
Phys. 241-242	Modern Physics	3	3
Electives		6	6
		<hr style="width: 100%;"/>	<hr style="width: 100%;"/>
		15	15

# Physics

**101-102. General Physics A.** An introduction to the primary phenomena and fundamental concepts of physics. The concepts are developed as logical conclusions from observations of pertinent lecture demonstrations. Calculus is not required. The subjects covered in the lectures are Mechanics, Heat, Sound, Electricity and Magnetism, Light, and Atomic and Nuclear Physics. The laboratory experiments illustrate various major principles characteristic of all but the last of the above fields.

*Credit—eight hours.*  
Two lectures, one recitation,  
one lab a week.  
Fall through Spring.

**107-108. Physics I.** A rigorous and intensive introductory course, covering topics in mechanics, wave motion, and thermodynamics. The lectures provide demonstrations of fundamental phenomena in physics, but emphasis is placed on the theoretical development of ideas. Frequent use is made of vector analysis and elementary differential and integral calculus. The laboratory problems require thoughtful and independent work; there may be opportunities for exceptional students to carry out original projects. High school physics is prerequisite; Mathematics 110, 111 to be taken concurrently. Students electing this course must be planning to take Physics 117-118 in a subsequent year.

*Credit—eight hours.*  
Three lectures, one recitation a week.  
One lab, one problem session  
in alternate weeks.  
Fall through Spring.

**111-112. General Physics B.** An extension of general physics for students who have completed Physics 101-102 and who desire further training in physics. The topics emphasized are statics, dynamics, thermodynamics and electromagnetism. Elementary calculus is used throughout; students should be taking Mathematics 150, 151 or 160, 161 concurrently. The laboratory work can be omitted from the course, with reduction of credit to six hours.

*Credit—eight hours.*  
Two lectures, one recitation,  
one lab per week.  
Fall through Spring.

**113. Elementary Modern Physics.** A discussion of the principles of relativistic and quantum physics, designed for students of the hu-

manities and social sciences. No mathematics beyond elementary calculus is needed. The structure of the course is flexible, but emphasis is consistently placed on the ways in which physics is influencing the development of other fields of knowledge. Physics 101-102 and Mathematics 100, 101 or their equivalent are prerequisite.

*Credit—three hours.*  
Three lectures a week.  
Fall term.

**114. Elementary Nuclear Physics.** A continuation of Physics 113 for non-science students interested in the most recent developments in physics. The approach and the mathematical level are the same as in Physics 113, which is prerequisite.

*Credit—three hours.*  
Three lectures a week.  
Spring term.

**117-118. Physics II.** A continuation of physics 107-108, covering topics in electromagnetism, optics, special relativity, and quantum physics. The mathematical level of the discussion is designed to keep pace with the student's development; it is required that he be taking Mathematics 160, 161 concurrently. Laboratory work is carried out in the same spirit as in 107-108, but the experiments are more sophisticated. Admission to this course is contingent upon satisfactory performance in Physics 107-108.

*Credit—eight hours.*  
Three lectures, one recitation,  
one lab a week.  
Fall through Spring.

**161. Electromagnetic Waves.** The equations which describe the propagation of light and other electromagnetic radiation are derived from the basic laws of electricity and magnetism. A mathematical treatment is given to the behavior of light waves. Physics 111-112 is prerequisite. Mathematics 150 is a prerequisite or should be taken concurrently. Taught by the Institute of Optics.

*Credit—three hours.*  
Three lectures a week.

**162. Physical Optics I.** (See Optics 162)

**213. Introduction to Modern Physics.** An intermediate course in quantum phenomena designed for students in science and engineering who are not majoring in physics. The topics most likely to be covered are black

body radiation, Bohr theory of the atom, the concepts of quantum mechanics, atomic structure and the periodic table, quantum statistics, x-rays, photoelectricity, and Compton scattering. Physics 111-112 and Mathematics 150, 151 are prerequisite.

*Credit—three hours.*  
Three lectures a week.  
Fall term.

- 221-222. **Electricity and Magnetism.** An advanced course in electromagnetic theory emphasizing the field point of view. Calculation of electric and magnetic fields; Maxwell's equations and electromagnetic waves; elementary radiation theory; the motion of charged particles in electric and magnetic fields. The application of classical electromagnetism to current problems in physics is discussed insofar as time permits. Physics 117-118 is prerequisite, or Physics 111-112 with consent of the instructor. Mathematics 200, 201 is recommended, and may be taken concurrently.

*Credit—six hours.*  
Three lectures a week.  
Fall through Spring.

223. **Electronic Properties of Solids.** Selected topics in solid-state physics and physical electronics. The subjects considered include energy band theory of solids, conduction in solids, thermionic and photoelectric emission, gaseous electronic conduction, semiconductors, dielectrics, crystalline imperfections, luminescence, photoconductivity, and others. Physics 213 or Physics 241 is prerequisite. Taught by the Institute of Optics.

*Credit—three hours.*  
Three lectures a week.  
Spring term.

224. **Introductory Electronics.** Physical principles of vacuum tubes and transistors; linear circuit theory; linear equivalent circuits involving vacuum tubes and transistors; linear amplifiers with and without feedback; power supplies; an introduction to non-linear and switching modes of vacuum tube and transistor circuits; the application of electronic devices to physical measurements. Physics 117-118 or 111-112 is prerequisite.

*Credit—three hours.*  
Two lectures, one lab a week.  
Spring term.

225. **Introduction to the Theory of the Solid State.** The purpose of the course is to introduce the fundamental concepts of solid state physics and acquaint the student with the terminology employed in this important branch of physics. The mathematical details

will be kept to a minimum. Particular attention will be given to the electron motions in the solid and the effect of these motions on the physical properties of the solid. Special emphasis will be given to the optical properties of solids. Two years college physics and two years college mathematics are prerequisite. Given in University School by the Institute of Optics.

*Credit—three hours.*  
Three lectures a week.  
Fall term.

230. **Thermodynamics.** A survey of thermodynamics, both from the classical and the statistical point of view. Topics covered include the concept of temperature, the three laws of thermodynamics and some of their consequences, followed by an introduction to statistical mechanics. Physics 107-108 or 111-112 is prerequisite, and students must have a prior knowledge of partial derivatives and multiple integrals.

*Credit—three hours.*  
Three lectures a week.  
Fall term.

- 231-232. **Introduction to Classical Physics.** Dynamics of systems of particles; Lagrange's equations; theory of rigid bodies; theory of small vibrations; elasticity; hydrodynamics. Physics 107-108 and Mathematics 200, 201 or 260, 261 prerequisite. May be taken concurrently with the consent of the instructor.

*Credit—six hours.*  
Three lectures a week.  
Fall through Spring.

- 241-242. **Modern Physics.** The concepts and phenomena of atomic and nuclear physics are studied, following an introduction to elementary wave mechanics. Physics 221-222 and Mathematics 200, 201 are prerequisite.

*Credit—six hours.*  
Three lectures a week.  
Fall through Spring.

261. **Physical Optics II.** (See Optics 261)

262. **Physical Optics III.** (See Optics 262)

283. **Senior Laboratory I.** An experimental course in atomic and nuclear physics, designed as an introduction to the most important techniques of modern research. Such experiments as beta and gamma spectroscopy and absorption, mass spectroscopy, X-ray diffraction, detection of nuclear particles, magnetic resonance, and measurements of atomic constants are performed with equipment of high calibre. Emphasis is placed on

the planning and interpretation of the measurements rather than on the construction of equipment. The recitations provide an opportunity for the student to report on individual experiments and improve his understanding of the theoretical basis for the work.

*Credit—three hours.*  
One recitation and two labs a week.  
Fall term.

284. *Senior Laboratory II.* A continuation of Physics 283.

*Credit—three hours.*  
One recitation and two labs a week.  
Spring term.

293-294. *Research Problems in Physics.* Normally open to seniors majoring in physics.

*Credit to be arranged.*  
Fall through Spring.

## Astronomy

103. *General Astronomy.* A descriptive, non-mathematical course designed to provide the student with a general knowledge of the universe as well as some understanding of the methods by which such knowledge is attained. When weather permits, evening observations will be made.

*Credit—three hours.*  
Three hours a week.  
Spring term.

202. *Solar System.* A comprehensive discussion of the sun, its planets, and other dependents. Topics included are: time; celestial coordinates; navigation; the earth as an astronomical body; elementary celestial mechanics; the sun (in so far as it affects the planets); the planets; satellites; minor planets; comets and meteors; physical conditions in the solar system; origin of the solar system. Prerequisites: Math. 150, 151 and Physics 111-112. Astronomy 103 is not a prerequisite.

*Credit—three hours.*  
Three hours a week.  
Offered first in 1960-61 and alternate years thereafter.

203. *Stellar Astronomy.* A description of the universe in which we find our solar system. Topics included in this course are: position and distances of stars; brightness of stars as distance measure; motions of the fixed stars; relation of these motions to galactic structure; double stars; star clusters; interstellar dust and gas; radiohydrogen and our galaxy; the external galaxies; cosmological problems; origin of stars and clusters; origin of the universe. Prerequisites: Math. 150, 151 and Physics 111-112. Astronomy 103 is not a prerequisite.

*Credit—three hours.*  
Three hours a week.  
Offered first in 1959-60 and alternate years thereafter.

204. *An Introduction to Astrophysics.* This course is concerned primarily with applications of atomic and nuclear physics in Astronomy. Topics included are: Masses, radii, luminosity and temperatures of the stars; descriptive atomic spectroscopy; thermodynamics and stellar spectra; nuclear reactions of astronomical interest; energy sources of the sun and stars; white dwarfs; stellar evolution. Prerequisites: Math. 150, 151 and Physics 111-112 and 241. Astronomy 103 is not a prerequisite.

*Credit—three hours.*  
Three hours a week.  
Offered first in 1959-60 and alternate years thereafter.

295. *Reading or Research in Astronomy.* Normally open to seniors majoring in physics and astronomy.

*Credit to be arranged.*  
One to three hours a week.





## Political Science

Professors DIEZ (on leave), WILTSEY; Visiting Professor DEAN; Assistant Professors BLUHM, FENNO (on leave), SCHER; INSTRUCTOR KAPLAN.

Political Science 101 and 102 are prerequisite to all other courses in Political Science except by special permission of the Department. A program of concentration in Political Science includes satisfactory completion of thirty-six hours beyond introductory courses, of which twenty-seven hours must be in Political Science. Courses in the concentration program will be chosen by students in consultation with the departmental adviser. Students must offer a minimum of two courses in Political Science chosen from Group B and at least one course each chosen from Group A and Group C.

### SAMPLE A.B. PROGRAM IN POLITICAL SCIENCE

#### Freshman Year

		HOURS	
		<i>1st Term</i>	<i>2nd Term</i>
Engl. 101, 102	English Composition	3	3
Pol. Sci. 101	European Political Systems	3	
Pol. Sci. 102	American Political Systems		3
Hist. 101-102	Introduction to Contemporary Civilization	3	3
Elective	Group III	3 or 4	3 or 4
Elective	Group I	3	3
Phys. Ed.	Physical Education	1	1
		<hr/>	<hr/>
		16 or 17	16 or 17

### Sophomore Year

Psych. 101-102	Introduction to Psychology	3	3
Pol. Sci. 261	Party & Pressure Politics in U.S.	3	
Elective	Group II	3, 6, or 9	6 or 9
Elective	Group I	3 or 6	3 or 6
Phys. Ed.	Physical Education	1	1
		16	16

### Junior Year

Pol. Sci. 251	International Politics I	3	
Pol. Sci. 252	International Politics II		3
Pol. Sci. 271	Politics of Administration	3	
Pol. Sci. 298	Scope & Methodology		3
Electives		9	9
		15	15

### Senior Year

Pol. Sci. 281	Constitutional Power Structure	3	
Pol. Sci. 282	Civil Rights		3
Pol. Sci. 285	Systematic Political Theory	3	
Pol. Sci. 286	Modern Political Ideologies		3
Electives		9	9
		15	15

101. *European Political Systems.* A comparative study of the background, political processes, institutions, and ideologies of selected European states including Great Britain, France, and the Soviet Union.

*Credit—three hours.*  
Three hours a week.  
Fall term.  
Staff

102. *The American Political System.* An examination of the background, political processes, institutions, and ideologies of the United States with comparative illustrations drawn from the governmental systems studied in Political Science 101. Political Science 101 is a prerequisite.

*Credit—three hours.*  
Three hours a week.  
Spring term.  
Staff

Group A. International Relations and Foreign Political Systems

251. *International Politics I.* An examination of the nature, environment, and objectives of nation-states and other significant groups.

*Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.  
Mr. Diez

252. *International Politics II.* An examination of processes, techniques, and patterns of behavior characteristic of international politics. Prerequisite: Political Science 251.

*Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.  
Mr. Diez

253. *Contemporary India and Its Role in World Affairs.* A consideration of the emergence of independent India from centuries of historical struggle to achieve a united country, beginning with earliest times. Political, economic, social, and cultural developments

in contemporary India, and the effect of these developments on India's foreign policy.

*Credit—three hours.*  
Three hours a week.  
Fall term.  
Mrs. Dean.

260. *Government and Politics in Contemporary Africa.* An examination and analysis of selected political, economic, and social problems in Africa south of the Sahara.

*Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.  
Mr. Diez

#### Group B. American Politics and Institutions

261. *Party and Pressure Politics in the United States.* An analysis of the activity of political parties and pressure groups in the American system of government. Attention will be given to the nature of the two-party system, national, state and local; the social bases of partisanship; electoral behavior; party organization, leadership, and strategy. Parties and pressure groups will be studied as participants in the making of public policy decisions.

*Credit—three hours.*  
Three hours a week.  
Fall term.  
Mr. Kaplan

271. *The Politics of Administration.* A study of the decision-making process in American public agencies. The internal power relations and the primary external sources of influence—political parties, legislatures, pressure groups, elected executives, and courts—are considered.

*Credit—three hours.*  
Three hours a week.  
Fall term.  
Mr. Scher

273. *The American Regulatory Process.* An analysis of the work of administrative agencies that have power to affect private rights. Emphasis will be placed on goals, powers, and procedures of administrative action and the pattern of restraints imposed through judicial review.

*Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.  
Mr. Wiltsey

281. *The Constitutional Power Structure.* A study of the constitutional pattern of power distribution between agencies of government and within the federal system as determined

by the American judiciary.

*Credit—three hours.*  
Three hours a week.  
Fall term.  
Mr. Wiltsey

282. *Civil Rights.* An examination of the permissible limits of governmental restraints on private rights and liberties as determined by the American judiciary. Prerequisite: Political Science 281.

*Credit—three hours.*  
Three hours a week.  
Spring term.  
Mr. Wiltsey

#### Group C. Political Theory

285. *Systematic Political Theory.* A study of systematic political theories from Plato to Lasswell. Emphasis is placed upon an assessment of the universality of the great political theories and their relevance to the understanding of contemporary political systems.

*Credit—three hours.*  
Three hours a week.  
Fall term.  
Mr. Bluhm

286. *Modern Political Ideologies.* A comparative study of important ideological currents in the age of nation-state, and their relationship to political events: constitutionalism, liberalism, conservatism, anarchism, socialism, communism, traditional authoritarianism, fascism, nationalism, corporatism.

*Credit—three hours.*  
Three hours a week.  
Spring term.  
Mr. Bluhm

287. *Theories of Peace and Freedom.* An examination of the ideals of peace and freedom and their psychological and institutional foundations in some classic works of Western political theory.

*Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.  
Mr. Bluhm

298. *Scope and Methodology of Political Science.* An examination of political science as a field of study. Emphasis will be placed upon scope, method, bibliography, and the relation of Political Science to allied disciplines. Required of all Political Science concentrators and open only to Political Science concentrators and graduate students in Political Science.

*Credit—three hours.*  
Three hours a week.  
Spring term.  
Staff



## Psychology

Professors SPRAGG, COWEN, V. NOWLIS, WENDT; Associate Professors ANDREAS, BOYNTON (on leave), FLAVELL, GREEN, JOHN; Assistant Professor ZAX; Research Associates \*ADER, \*DEMOTT, \*V. HARWAY, \*IKER, JACOBS, \*LOWY, \*N. MILLER, \*NEWHALL, ONLEY, \*URELES; Clinical Associates \*AXELROD, \*BERKOWITZ, \*BROIDA, \*FRIEDMAN, \*HARLOW, \*MCNEAL, \*PARSONS, \*SALZMAN, \*SIPLE, \*SMITH, \*STAIMAN, \*TELESCHOW; Technical Associates SACHS, SPECHT; Administrative Assistant and \*Research Associate CAMERON.

*Concentration requirements:* All students are required to complete Psychology 201-202 by the end of the Junior Year. Students are urged to include Psychology 242 and 214 in their programs. Those with interests in the biological sciences should include biology, physics, and chemistry as related courses. Those with interests in the social sciences should include biology, sociology, economics, and other social sciences. Students planning to pursue graduate studies in psychology should include Psychology 209 and seek a broad foundation in other disciplines, including the above-named, mathematics and philosophy to the extent possible. Such students should consult with a departmental adviser at the earliest possible date.

\*Part-time.

## SAMPLE A.B. PROGRAM IN PSYCHOLOGY<sup>1</sup>

### Freshman Year

		HOURS	
		<i>1st Term</i>	<i>2nd Term</i>
Eng. 101, 102	English Composition	3	3
Hist. 101-102	Introduction to Contemporary Civilization	3	3
Phil. 101	Introduction to Philosophy	3	
Phil. 102	Ethics		3
Phys. 101-102	General Physics A	4	4
Math. 100, 101	Introductory College Mathematics	4	4
Phys. Ed.	Physical Education	1	1
		18	18

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### Sophomore Year

Math. 150, 151	Intermediate Calculus	4	4
Psych. 101-102	Introduction to Psychology	3	3
Biol. 101-102	General Biology	4	4
Chem. 121, 122	General Chemistry	4	4
Phys. Ed.	Physical Education	1	1
		16	16

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### Junior Year

Psych. 201-202	Experimental Psychology	4	4
Psych. 209	Statistics in Psychology	3	
Psych. 242	Social Psychology		3
Chem. 161-162	Organic Chemistry	4	4
Germ. 101-102	Elementary German	3	3
Elective	Group I or II	3	3
		17	17

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### Senior Year

Psych. 203	Physiological Psychology	3	
Psych. 205	Comparative Psychology		3
Psych. 214	Abnormal Psychology		3
Psych. 220	Psychology of Learning		3
Germ. 105	Readings in Scholarly and Technical German Prose	3	
Germ. 106	Special Technical Readings		3
Biol. 125	Comparative Chordate Anatomy	4	
Biol. 265	Cellular Physiology and Metabolism	3	
Phil. 252	Philosophy of Science		3
Elective	Group I or II	3	
		16	15

<sup>1</sup>This particular program gives emphasis to the natural science status of Psychology.

Other programs are adapted to the interests of students whose goals involve the study of social science, education, medicine, etc.

**101-102. Introduction to Psychology.** A systematic study of the principles of human behavior and experience, and the relation of psychological facts to everyday life. Lectures and class discussions supplemented by experiments and demonstrations. This course should be elected in the sophomore year. Prerequisite for all other courses in the department except 209. Prerequisite for all programs leading to a teacher's certificate. Open to freshmen by special permission.

*Credit—six hours.*  
Three hours a week.  
Fall through Spring.  
Mr. Nowlis

**201-202. Experimental Psychology.** Techniques and methods in the experimental study of human behavior, motor co-ordination, sensory and perceptual processes, discrimination, experimental esthetics, conditioning, learning, memory, transfer and interference, thinking and reasoning, emotion, and personality. The experiments are selected on the basis of their factual content and their illustration of basic experimental designs and procedure in the analysis of human behavior. Psychology 101-102 and permission of departmental adviser prerequisite.

*Credit—eight hours.*  
Six hours a week.  
Fall through Spring.  
Mr. Andreas

**203. Physiological Psychology.** Physiological basis of co-ordination, learning, perception, thought, emotion, and motivation of behavior. Some material on sensory processes. Psychology 101-102, Biology 101-102 prerequisite.

*Credit—three hours.*  
Three hours a week.  
Fall term.  
Mr. Wendt

**205. Comparative Psychology.** The concepts of the science of behavior and the application of scientific method to the study of animal conduct. This course deals with the evolution of behavior and intelligence, the receptor control of activity, periodicity in behavior, and higher mental processes in animals. Psychology 101-102 prerequisite.

*Credit—three hours.*  
Spring term.  
Mr. Wendt

**207. Psychological Analysis of Behavior in Groups.** A course considering problems of the behavior of the individual in group set-

tings. Emphasis is on the psychological analysis of small groups, of communication and persuasion processes in small groups as well as by mass media, and of other important areas of interpersonal relations. Open to a limited number of seniors and graduate students by permission of the instructor. Psychology 101-102 and Psychology 242 prerequisite. (Given in University School)

*Credit—three hours.*  
Three hours a week.  
Fall term.

**209. Statistics in Psychology.** An introduction to the application of statistical methods. Although the illustrations of the applications presented are taken primarily from the field of Psychology, the course will also be suitable for students interested in the application of statistical methods to sociology, education, and biology.

*Credit—three hours.*  
Three hours a week.  
Fall term.  
Mr. Green

**210. Child Psychology.** A consideration of the development of the child in the periods before and immediately after birth, during infancy, and adolescence. Special attention will be given to the development of socialization, personality, emotion, language. Class lectures will be supplemented by demonstration films. Psychology 101-102 prerequisite.

*Credit—three hours.*  
Three hours a week.  
Spring term.  
Mr. Flavell

**211. Mental Measurement.** A survey of the major findings in the field of psychological measurement. Individual differences in intelligence and personality traits are studied and an analysis made of the contribution of heredity, race, sex, and various environmental factors to these differences. Class demonstration of the principal tests. Psychology 101-102 prerequisite.

*Credit—three hours.*  
Three hours a week.  
Fall term.  
Mr. Zax

**213. Personality Dynamics.** A survey of the basic methods in studying personality. An analysis of factors determining the course of behavior and personality development. Emphasis on the study of modern personality theories as they bear on areas such as conflict, frustration, the defense mechanisms and allied phenomena. Consideration given to

current research in the field. Psychology 101-102 prerequisite.

*Credit—three hours.*  
Three hours a week.  
Fall term.  
Mr. Cowen

**214. *Abnormal Psychology.*** A consideration of the etiological factors, clinical description, and treatment of personality aberrations, emphasizing the more serious forms of mental disorder. Class lectures are supplemented by demonstrations. Psychology 101-102 prerequisite.

*Credit—three hours.*  
Three hours a week.  
Spring term.

**220. *Psychology of Learning.*** An intensive study of psychological theory and findings which bear upon problems in conditioning and learning. Principles of transfer of training will be discussed in relation to their applicability to education and to other training situations.

*Credit—three hours.*  
Three hours a week.  
Spring term.  
Mr. Andreas

**230. *Junior Seminar.*** Designed to afford an opportunity to become more familiar with the problems of research in Psychology. During each section of the course, ongoing research is discussed by the sponsoring department member. Papers pertaining to that research area are prepared by each student for further discussion. In one semester a majority of the areas of research interest within the department will be covered. Open to Junior Psychology concentrators by permission only.

*Credit—three hours.*  
Two and one half hours.  
Spring term.  
Staff



**242. *Social Psychology.*** This course will be primarily concerned with the individual as he lives in particular social environments. Among the more important topics considered are: the formulation of attitudes and their measurement, language and problems of social communication, the psychology of the crowd, the psychology of leadership and followership, group dynamics, the individual and social institutions, prejudice and minority group relations. Psychology 101-102 prerequisite.

*Credit—three hours.*  
Three hours a week.  
Spring term.

**247. *Psychology in Business and Industry.***

The applications of psychological findings and methods to problems encountered in business, industry and the professions. Topics include the following: personnel selection, training, and evaluation; motivation and morale; problems of supervision and management; factors in efficient performance; human engineering; problems of safety (industrial and transportation accidents); market, product, advertising, and selling research; a brief consideration of applications of psychology to the professions. Psychology 101-102 prerequisite.

*Credit—three hours.*  
Three hours a week.  
Fall term.  
Mr. Spragg

**293. *Reading Course.*** Supervised reading on topics not covered by existing courses or on specialized topics. Open only by special permission of the instructor.

*Credits normally three hours each term.*  
Fall and spring term.  
Staff

**297. *Special Problems Course.*** The investigation, under guidance, of a special problem in experimental psychology and the presentation of the result of the research in a paper. Open only by special permission of the instructor.

*Credits to be arranged.*  
Fall and spring terms.  
Staff

NOTE: For graduate courses in Psychology consult the Bulletin of the Graduate School.



## Religion

**101. *Introduction to Biblical Thought.*** A study of the major elements in the thought of the Hebrew-Christian tradition, with emphasis on careful analysis of Biblical material, and on the contemporary significance of this tradition. Lecture and discussion.

*Credit—three hours.*  
Three hours a week.  
Fall term.  
Mr. Hamilton

**103. *History of Religion.*** An introductory comparative survey of the major religions in the world today in terms of their basic ideas and practices. Special attention will be given

to Hinduism, Buddhism, Taoism, Confucianism, Judaism and Christianity.

*Credit—three hours.*  
Three hours a week.  
Spring term.  
Mr. Devadutt

**104. *Religion and Our Civilization.*** An introductory survey of the role of the Judaeo-Christian tradition in Western civilization, with special reference to the contemporary significance of the New Testament.

*Credit—three hours.*  
Three hours a week.  
Omitted 1960-61.

# *College of* EDUCATION

The College of Education prepares undergraduate students for careers in teaching. The Division of Nursing Education, a unit of the College prepares registered nurses for positions of leadership and responsibility in the administrative and educational fields of nursing.





## Teacher Education Programs

The teacher education programs at The University of Rochester are planned to include a broad liberal background, sound professional preparation, and specialization or concentration in academic fields.

Qualified students may follow programs of study which lead to the degree of Bachelor of Science and New York State certification for teaching in the elementary schools or provisional certification for teaching secondary school academic subjects.

**ADMISSION.** All students who plan to major in Education and follow a career in teaching should apply for admission to the College of Education. This application should be submitted during the last semester of the second college year. Among the requirements for admission to the undergraduate teacher education degree programs are:

- a. Completion of a minimum of 60 semester hours of selected course work.
- b. A 2.0 honor point average based upon all course work taken prior to admission.
- c. A satisfactory health record.
- d. A strong desire to make teaching a career.
- e. Satisfaction of any other admission standards and requirements established by the College of Education and acceptance by the Committee on Admissions of the College. During the first two years of college a prospective teacher should complete as many distribution requirements as possible and should include Education 200 and Psychology 101-102 in his program.

Transfer students from other colleges who are applying for junior or senior standing may be admitted into the College of Education through the Office of Admissions of The University of Rochester River Campus.

Each student in the College of Education is assigned a departmental counselor.



**Program in Elementary Education.** A program<sup>1</sup> is planned by the student and his counselor from the general outline below. It includes during the senior year a semester of full-time student teaching in schools of the Rochester area.

<b>I. Distribution Requirements<sup>2</sup></b> .....	<b>36 hours</b>
A. English 101-102 (unless excused) .....	6 hours
B. Two courses from Group I .....	12 hours
C. Social Science .....	6 hours
Chosen from Economics 151-152; History 101-102; Government 101, 102; Philosophy 101, 102, or Sociology 101-102	
D. Science .....	12 hours
One course approved for science distribution and Psychology 101-102	
<b>II. Education Requirements</b> .....	<b>40 hours</b>
A. Educational Foundations .....	3 hours
Education 200	
B. Educational Psychology .....	6 hours
Education 210 and one other course chosen from Education 212 or Psychology 210	
C. Elementary School Methods .....	16 hours
Education 220-221	
D. Student Teaching .....	15 hours
Education 229	
<b>III. Group Concentration Requirements</b> .....	<b>30 hours</b>
This requirement must be met by choosing 18 hours from one group and 12 hours from a second group exclusive of courses selected to fulfill the distribution requirement	
<b>IV. Physical Education</b> .....	<b>4 hours</b>
<b>V. Electives</b> .....	<b>20 hours</b>
<b>Total</b> .....	<b>130 hours</b>

Students majoring in elementary education should include in their total college program at least 6 hours of geography and 6-12 hours in history, including American History. These courses may be part of the distribution requirements, the group concentration requirements or the general electives. Some course work in speech is highly desirable.

<sup>1</sup>This program qualifies a student for a New York State certificate for teaching in elementary schools. It does not meet certification requirements in some states. Students who wish to prepare for certification in other states should consult a counselor in the College of Education.

<sup>2</sup>See page 83 of this Bulletin.

**Program in Secondary Education.** An undergraduate student working toward a degree in the College of Education and preparing to teach an academic subject in the secondary schools, grades 7 through 12, will plan a program<sup>1</sup> with the aid of his counselor according to the general outline below. This program requires that a student spend half of each day for a semester of his senior year in student teaching.

<b>I. Distribution Requirements<sup>2</sup></b> .....	<b>36 hours</b>
A. English 101-102 (unless excused) .....	6 hours
B. Two courses from Group I .....	12 hours
C. Social Science .....	6 hours
Chosen from Economics 151-152; History 101-102; Political Science 101, 102; Philosophy 101, 102, or Sociology 101-102	
D. Science .....	12 hours
One course approved for science distribution and Psychology 101-102	
<b>II. Education Requirements</b> .....	<b>24 hours</b>
Education 200 .....	3 hours
Education 210 .....	3 hours
Education 230 .....	3 hours
Special Methods .....	3 hours
(Education 231, 232, 234, 235 or 236)	
Education 239 .....	6 hours
Education electives .....	6 hours
<b>III. Teaching Field</b> .....	<b>30-36 hours</b>
<b>IV. Physical Education</b> .....	<b>4 hours</b>
<b>V. Academic electives to make a total of 130 semester hours</b> .....	<b>30-36 hours</b>
<b>Total</b> .....	<b>130 hours</b>

Students who wish to meet minimum certification requirements for secondary school teaching while earning degrees in other colleges of the River Campus should apply for admission to the Teacher Education Sequence no later than the end of the first semester of their junior year. Applications should be submitted to the College of Education office. Information concerning New York State certification requirements may be obtained from that office.

<sup>1</sup>This program will satisfy requirements for a New York State provisional certificate. To continue teaching academic subjects in the schools of the State a teacher must complete a fifth year of college work leading to the permanent certificate.

<sup>2</sup>See page 83 of this Bulletin.

# COLLEGE OF EDUCATION

## Dean

**William A. Fullagar**, ED.D.  
220 Dewey Hall

## Associate Dean for Graduate Studies

**Robert B. Howsam**, ED.D.  
221 Dewey Hall

## Chairman, Division of Nursing Education

**Esther M. Thompson**, R.N., A.M.  
7 Taylor Hall

## Counselor of Students

**Donald H. Smith**, B.S.  
209 Dewey Hall

## Administrative Assistant to the Dean

**Sylvia Grossman**  
219 Dewey Hall

# Faculty

**Howard R. Anderson**, PH.D. (Iowa)  
Professor of Education

**William A. Fullagar**, ED.D. (Columbia)  
Professor of Education

**Thomas Jordan Hill**, ED.D. (Florida)  
Professor of Education

**Robert B. Howsam**, ED.D. (California)  
Professor of Education

**Esther M. Thompson**, R.N., A.M. (Columbia)  
Professor of Nursing Education

**Byron B. Williams**, PH.D. (Ohio State)  
Professor of Education

**Arthur L. Assum**, A.M. (Ohio State)  
Associate Professor of Education

**Catherine C. Brophy**, R.N., A.M. (Columbia)  
Associate Professor of Nursing Education

**Joseph W. Cole**, ED.D. (Harvard)  
Associate Professor of Education

**Florence E. Dunn**, R.N., A.M. (Columbia)  
Associate Professor of Nursing Education

**Frances L. Horler**, PH.D. (Chicago)  
Associate Professor of Education

**Glenn N. Hontz**, ED.D. (Columbia)  
Assistant Professor of Education

**Clarence J. Karier**, PH.D. (Wisconsin)  
Assistant Professor of Education

**Thomas Knapp**, ED.D. (Harvard)  
Assistant Professor of Education

**Inga B. Kromann**, PH.D. (Minnesota)  
Assistant Professor of Education

**John J. Montean**, PH.D. (Syracuse)  
Assistant Professor of Education

**Harold L. Munson**, M.A. (Albany State)  
Assistant Professor of Education

**Clarence M. Williams**, A.M. (Michigan State)  
Assistant Professor of Education

**Dolores J. Graham, R.N., B.S.** (Rochester)  
Instructor in Nursing Education

**Lois Zakia, M.S.** (Rochester)  
Instructor in Nursing Education

\***Walter W. Bennett, Ed.M.** (Rochester)  
Lecturer in Education

\***Lester B. Foreman, A.M.** (Rochester)  
Lecturer in Education

\***Herman R. Goldberg, A.M.** (Columbia)  
Lecturer in Education

\***Estelle Hawley, Ph.D.** (Rochester)  
Lecturer in Nursing Education

\***Howard E. Kiefer, Ed.D.** (Buffalo)  
Lecturer in Education

\***Elisabeth C. Phillips, R.N., M.A.** (Columbia)  
Lecturer in Nursing Education

\***Catherine J. Sullivan, M.A.** (Columbia)  
Lecturer in Education

\***H. Carlisle Taylor, B.A.** (Rochester)  
Lecturer in Education

\***Carlos DeZafra, M.A.** (New York University)  
Associate Lecturer in Education

\***Abe A. Hollander, Ed.M.** (Rochester)  
Associate Lecturer in Education

\***Lawrence K. Lipsett, Ed.D.** (Buffalo)  
Associate Lecturer in Education

\***Robert P. Dye, M.S.** (St. Bonaventure)  
Assistant Lecturer in Education

\***H. Hunter Fraser, Ed.M.** (Rochester)  
Assistant Lecturer in Education

\***Bernard Greenberger, M.A.** (Syracuse)  
Assistant Lecturer in Education

\***Vivian T. Harway, Ph.D.** (Rochester)  
Assistant Lecturer in Education

\***Paul Knoke, B.S.** (Wisconsin)  
Assistant Lecturer in Education

\***Helen Kristal, M.S.S.** (Smith College School of  
Social Work)  
Assistant Lecturer in Nursing Education

\***Margaret L. Rathbun, M.D.** (Rochester)  
Assistant Lecturer in Nursing Education

\***Edna Weeks Smith, B.S.** (New York University)  
Assistant Lecturer in Education

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\* Part-time.

# Courses of Instruction

## EXPLANATION OF COURSE NUMBERING SYSTEM

- 1-99 Non-credit courses.  
100-199 Introductory courses—usually at the freshman and sophomore level—no graduate credit.  
200-289 Courses at the junior and senior level, may also carry graduate credit unless otherwise specified.  
290-299 Undergraduate reading or research courses.  
300-399 Courses in the Honors Division.  
400-489 Graduate courses at the master's level or the first-year of graduate study. Open to undergraduates only by special arrangement.  
490-499 Master's level, reading or research courses.  
500-589 Advanced or specialized graduate courses usually represent study at the doctoral level.  
590-599 Ph.D. reading or research courses.

200. *Education in the American Social Order.* (Fall and Spring) A survey of the social background of modern education; the purposes and organization of education in the United States, the status of contemporary educational problems and the proposals for their solution; opportunities and requirements in education as a profession. This is the first course in the undergraduate sequence.

*Credit—three hours.*

Fall: Tues., 8:00-8:50 a.m.

Thurs., 8:00-12:00 noon.

Spring: Tues., 8:00-8:50 a.m.

Thurs., 8:00-12:00 noon.

210. *Psychology for Teachers.* (Fall and Spring) Psychology of learning and teaching. Studies of growth and achievement emotional development, simple and complex types of learning, purposive behavior, intelligence, and measurement. Seeks to meet the needs and problems of the classroom teacher. Prerequisites: Psychology 101-102 or equivalent.

*Credit—three hours.*

Fall: Section 1: Tuesday., 9:00-11:50 a.m.

Section 71: Tuesday., 7:10-9:55 p.m.

Spring: Mon., Wed.; 4:20-5:35 p.m.

212. *Children's Behavior Problems.* (Spring) The factors underlying behavior problems and delinquency in young children. Hereditary influences, physical conditions and handicaps, family environment, and cultural forces in the causation and determination of behavior. Appropriate methods of establish-

ing satisfactory adjustment to people and events. Prerequisites: Psychology 101-102, Education 210. Open only to seniors except by permission of instructor.

*Credit—three hours.*

Tues., Thurs.; 4:20-5:30 p.m.

- 220-221. *The Elementary School Curriculum.*

This full-year course examines principles, methods and materials of teaching which are appropriate to the various areas of the elementary school curriculum (reading and the language arts, arithmetic and science, social studies, arts and crafts, music, creative dramatics, health and recreation). Provision is made for a study of such aspects of the teacher's work as the planning of instructional activities, the measurement and evaluation of pupil progress, and the use of audiovisual methods and materials of instruction. Students observe and participate in classroom activities of area elementary schools. Theoretical study and practical classroom experience are closely integrated through regular seminar meetings with the instructional staff. Open only to students admitted to College of Education. To be taken during junior year.

*Credit—sixteen hours.*

Mon. & Wed., 8:30-12 noon.

1:00-4:00 p.m.

Fri., 8:30-12:00 noon.

223. *The Teaching of Science in the Elementary School.* (Spring) Study of the materials and content of elementary school science and methods of helping children understand

scientific principles and information.

*Credit—three hours.*  
Mon., 7:10-9:55 p.m.

**225. *Children and the Creative Arts.* (Fall)**

Consideration of art, music, and dramatic play activities for children. Study of current trends, objectives, and procedures in selection of appropriate and desirable experiences with emphasis on development of creative potentialities of children. Workshop techniques utilized to provide students opportunity to work with various media and processes.

*Credit—three hours.*  
Fall: Wed., 7:00-10:00 p.m.

**229. *Student Teaching in the Elementary School.***

Each student is provided the opportunity to assume gradually increasing responsibility for the total instructional program in a classroom of an elementary school in the Rochester area. The guidance of the student is cooperatively shared by a college staff member and the sponsor teacher in the school to which the student is assigned. Through regular seminar meetings, the students critically analyze problems, principles and techniques of teaching with special reference to their student teaching experiences. Applications for student teaching must be made by April 15 for the Fall Semester and by December 15 for the Spring Semester. Prerequisites: Education 200, 210 and 220-221 or equivalent.

*Credit—fifteen hours.*  
Hours to be arranged.

**230. *Principles of Teaching in the Secondary School.* (Fall and Spring)**

Critical analyses of principles and techniques of teaching in secondary schools. Interpretation of the objectives of teaching and evaluation of typical procedures. Education 210 prerequisite, except by special arrangement with the instructor.

*Credit—three hours.*

Fall:

Thurs., 7:10-9:55 p.m.

Spring:

Section 1: Tues., 9:00-11:50 a.m.

Section 61: Tues., Thurs.; 4:20-5:35 p.m.

**231. *The Teaching of English in the Secondary School.* (Fall)**

A study of recognized methods of teaching English in the secondary schools. The selection of materials for the teaching of literature and composition; the means of providing for individual differences, interests and capacities; ways of developing proper habits of reading and study; lesson planning, the construction of objective tests,

and evaluation of teaching materials. Education 210 and sufficient subject matter background is a prerequisite.

*Credit—three hours.*  
Mon., Wed.; 4:20-5:35 p.m.

**232. *The Teaching of Social Studies in the Secondary School.* (Fall)**

The aims, present tendencies, and suggested programs in the social studies in relation to the general aims of instruction. Opportunities provided for the examination of textbooks, collateral readings, professional periodicals, visual aids, standard reference works, and other materials. Construction of lesson plans and objective tests. Education 210 and sufficient subject matter background is a prerequisite.

*Credit—three hours.*  
Mon., Wed.; 4:20-5:35 p.m.

**234. *The Teaching of Science in the Secondary School.* (Fall)**

Consideration of the content of the high school sciences, methods of selection and organization of curriculum materials and equipment, and procedures for teaching and evaluation. Education 210 and sufficient subject matter background is prerequisite.

*Credit—three hours.*  
Mon., Wed.; 4:20-5:35 p.m.



235. *The Teaching of Modern Foreign Languages in the Secondary School. (Fall)* Provides experience in lesson planning and in the use of audio-visual materials and evaluation of instruction. Consideration of the methods of teaching and the content of high school courses. Education 210 and sufficient subject matter background is a prerequisite.

*Credit—three hours.*  
Mon., Wed.; 4:20-5:35 p.m.

236. *The Teaching of Mathematics in the Secondary School. (Fall)* Survey of desirable methods in the teaching of mathematics. The objectives, content, and methods of presenting the basic topics in arithmetic, algebra, geometry, and trigonometry. Some discussion of typical curriculum procedures for testing and evaluation. Education 210 and sufficient subject matter background is prerequisite.

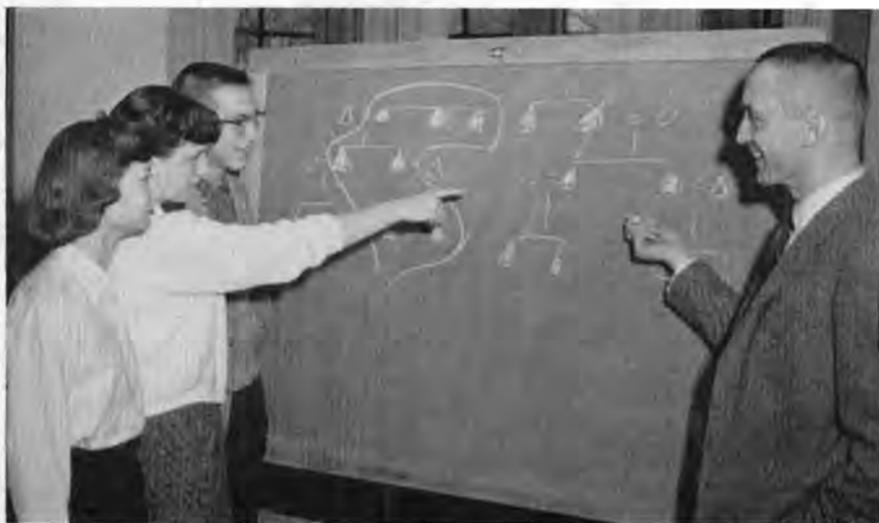
*Credit—three hours.*  
Mon., Wed.; 4:20-5:35 p.m.

239. *Student Teaching in the Secondary School. (Fall and Spring)* Observation, participation, and classroom teaching are done in the public day high schools of Rochester and vicinity. Application for admission to the course must be made to the College of Education at least six weeks in advance of registration. Prerequisites: Education 200, 210, 230 and one of the following: Education 231, 232, 234, 235, 236.

*Credit—six hours.*  
Hours to be arranged.

280. *Audio-Visual Materials and Methods. (Fall)* Designed to develop understanding of values of audio-visual materials and their effective use. Consideration of field trips, museum materials, projected still pictures, motion pictures, recordings, transcriptions, and radio and television programs. Discussion of bases for selection, evaluation, and use of audio-visual materials. Opportunities given students to develop skill in the operation of audio-visual equipment.

*Credit—three hours.*  
Sat., 9:15-12:00 noon.



# Division of Nursing Education

## GENERAL INFORMATION

**GENERAL NURSING PROGRAM.** The aim of this program is to provide a course of study for graduates of diploma schools of nursing, which will enable them to strengthen their basic preparation for professional nursing in hospitals and public health nursing agencies. Through the coordination of rich experience in nursing with a foundation in liberal arts, the student is expected to achieve competencies to practice nursing in all beginning positions and to secure the needed background for advanced study.

## SCHOLARSHIP AND STUDENT AID

A limited number of loans for study in nursing education are granted each year by the Genesee Valley Nurses Association to nurses who hold membership in the organization.

Limited loan funds are available to full-time students. Information concerning loan funds may be secured from the Division of Nursing Education.

Students desiring to finance part of their program may apply for staff positions in one of the local hospitals. For information concerning the employment policies, the student should write to the director of nursing of the hospital in which she is interested, or to Miss Esther M. Thompson, Chairman of the Division of Nursing Education, The University of Rochester.

## GRADUATE NURSE EXAMINATION

Application cards and information concerning the Graduate Nurse Examination may be secured from the office of the Division of Nursing Education. This examination for 1960-1961 will be given on a Saturday in October and April.

## STUDENT ACTIVITIES

Students in the Division of Nursing Education have formed their own club to foster the development of student participation in group activities. The program of activities includes coffee hours, student mixers, picnics, and teas.

## PROGRAM FOR THE BACHELOR'S DEGREE GENERAL REGULATIONS

The following degree is available to graduate nurses: Bachelor of Science with a Major in General Nursing, awarded by the College of Education.

**ADMISSION REQUIREMENTS:** The general requirements for admission are graduation from a secondary school in which the student has completed the normal number of units of secondary school work (16) properly distributed so as to constitute an adequate preparation for the degree program.

In addition candidates for admission must satisfy the following:

1. They must be graduated from an accredited school of nursing.
2. They must be registered in the state in which they are practicing nursing.
3. They must take and achieve an acceptable standing on the Graduate Nurse Examination. Results of this examination will be used to plan individual programs and to determine advanced standing. The fee for this examination is \$10 and should be paid at the time application is made.

Application blanks may be secured from the Division of Nursing Education. All inquiries should be addressed to the Chairman, Division of Nursing Education. Programs for full-time or part-time study should be planned in consultation with a member of the Division of Nursing Education.

**DEGREE REQUIREMENTS.** The degree requires the completion of at least 130 semester hours of credit and 260 points of credit.

All graduating students are urged to take the Area and Aptitude tests of The Graduate Record Examination. Arrangements to take this examination may be made through the Division of Nursing Education.

**RESIDENCE REQUIREMENT.** The minimum residence requirement for any degree, according to the New York State Education Department, is one year of full-time study. This requirement must be met by 30 semester hours and 60 points of credit taken in full-time residence or through part-time study in The University of Rochester Evening Session or the River Campus Summer Session. Extramural courses will not meet this requirement.

Programs are subject to periodic review.

The courses of study prescribed for the degree follow:

### THE DEGREE BACHELOR OF SCIENCE WITH A MAJOR IN GENERAL NURSING

Advanced Standing (based on satisfactory performance on the Graduate Nurse Examination) .....	42 hours
Group I .....	18 hours
*English 101, 102 (English Composition) .....	6 hours
*English 103, 104 (Introduction to Literature) .....	6 hours
Electives .....	6 hours
Group II .....	12 hours
*Sociology 101, 102 (Introduction to Sociology) .....	6 hours
History 101, 102, Economics 101, 102 or Political Science 101, 102 .....	6 hours
Group III and IV .....	20 hours
*Biology 101, 102 (General Biology) .....	8 hours
*Psychology 101, 102 (Introduction to Psychology) .....	6 hours
Bacteriology (Bio. 117) .....	3 hours
Physiology (Bio. 111) .....	3 hours
Chemistry 101, 102, 111-112, 121, 122 .....	8 hours
Physics 105 .....	3 hours
Group II, III, or IV electives or appropriate equivalents .....	10 hours

\*Required

Concentration.....	28 hours
Casework Approach in Nursing.....	2 hours
Methods and Materials of Health and Clinical Teaching.....	3 hours
Principles of Nutrition.....	3 hours
Public Health Programs and Biostatistics.....	3 hours
Introduction to Management in Nursing.....	2 hours
Field Work in Public Health Nursing.....	3 hours
Introduction to Public Health Nursing.....	3 hours
Nursing I.....	3 hours
Dynamics of Human Behavior.....	3 hours
Nursing II.....	3 hours
Total.....	130 hours

### PREREQUISITES

Graduation from an approved school of nursing.

Licensure in one or more states.

Satisfactory achievement on the Graduate Nurse Examination.<sup>1</sup>

Prior to enrollment for the semester of field experience, students must have completed, on a part or full-time basis, the distribution requirement for the first year. Students whose program of study for the basic diploma has not included experience in the required clinical specialties may be asked to do field experience in these fields. For a limited period of time the following concentrate of courses in the public health nursing program will be retained for those students who are working toward certification requirements by the Public Health Council of the State Department of Health or school nurse-teacher certification by the State Education Department:

- Introduction to Public Health Nursing
- Advanced Public Health Nursing
- Principles of Nutrition
- Public Health Programs & Biostatistics
- Methods and Materials of Health and Clinical Teaching
- Organization and Administration of the School Health Program
- Supervised Practice Teaching
- Field Work: Public Health Nursing

Because of the complexity of certification requirements and the many changes now taking place on certification regulations, students are cautioned against attempting to complete requirements without first seeking advice from a member of the Nursing Education faculty.

<sup>1</sup>May be taken after beginning study.

# Courses of Instruction

## IN NURSING EDUCATION

### 220. *Field Work in Public Health Nursing.*

(Fall and Spring) Guided observation and supervised practice in a community agency offering public health nursing services. Through the experience of working with carefully selected families, an opportunity is given to learn the scope and methods of public health nursing functions, as well as the contributions of other workers concerned with health and social welfare.

Sec. 1: *Credit—three hours.*

Hours to be arranged.

Sec. 2: *Credit—variable.*

Hours to be arranged.

### \*221. *Introduction to Public Health Nursing.*

(Fall and Spring) General responsibilities of the public health nurse and of the organization of nursing services in public health programs in both urban and rural areas, under official and voluntary agencies. Considers the interrelationships between public health nursing, hospital nursing, and other community health and social agencies. Given con-

currently with field experience in public health nursing.

*Credit—three hours.*

Fall:

Sec. 1: Fri., 9:00 a.m.—12:00 noon  
2:00—4:00 p.m.

Thurs., 5:45—8:00 p.m.

Sec. 2: Mon., Wed.; 7:10—8:25 p.m.

Spring:

Sec. 1: Fri., 9:00 a.m.—12:00 noon  
2:00—4:00 p.m.

Thurs., 5:45—8:00 p.m.

\*223. *Principles of Nutrition.* (Fall) The study of normal dietary requirements of varied age groups and recent developments in the dietary treatment of disease.

*Credit—three hours.*

Tues., Thurs.; 5:45—7:00 p.m.

\*224. *Nursing I.* (Fall and Spring) Opportunity in the psychiatric nursing unit to gain an understanding of behavior, with

special emphasis on the nurse-patient relationship.

*Credit—three hours.*  
Hours to be arranged.

\*225. *Dynamics of Human Behavior.* (Fall and Spring) This course supplements the field program in mental health nursing. Emphasis is given to the factors affecting development of personality.

*Credit—three hours.*  
Hours to be arranged.

\*226. *Nursing II.* (Fall and Spring) A planned field experience in a selected hospital designed to give the graduate nurse the opportunity to participate, under guidance, as a member of a nursing team.

*Credit—three hours.*  
Hours to be arranged.

228. *Advanced Public Health Nursing.* (Spring) Development, present practices, and trends in the special services such as maternal, infancy and child health, communicable disease, geriatrics, medical rehabilitation, and industrial hygiene.

*Credit—three hours.*  
Mon., Wed.: 5:45-7:00 p.m.

\*230. *Methods and Materials of Health & Clinical Teaching.* (Fall and Spring) Analysis of learning activities available in public health nursing agencies, hospitals, and schools of nursing. Methods used in teaching individuals and groups.

*Credit—three hours.*  
Fall: Mon., Wed.: 4:20-5:35 p.m.  
Spring: Mon., Wed.: 7:10-8:25 p.m.

239. *Supervised Practice Teaching.* (Fall and Spring) Observations and practice teaching in schools of nursing and/or high schools in Rochester and vicinity. Application for registration in this course must be received at

least three months in advance.

*Credit—three hours.*  
Hours to be arranged.

\*272. *Introduction to Management in Nursing.* (Spring) This course is designed to acquaint the student with Technics and Principles of Management as these apply to planning for patient care.

*Credit—two hours.*  
Tues., 7:10-8:50 p.m.

274. *Organization and Administration of the School Health Program.* (Spring) The school health program, its scope, function, organization and administration and its relation to community health programs; the role of school personnel in implementing the program.

*Credit—three hours.*  
Tues., Thurs.: 4:20-5:35 p.m.

\*276. *Public Health Programs and Biostatistics.* (Spring) History, organization, objectives, and activities of federal, state, and local public health agencies; the relationship to other governmental and voluntary health and social agencies. Major health problems, principles underlying preventive disease, and the use and interpretation of vital statistics.

*Credit—three hours.*  
Fri., 5:45-8:25 p.m.

\*282. *Casework Approach in Nursing.* (Spring) Using case material, the course will set out to examine the dynamic elements that make up a relationship between people, with stress on how this can be used by a nurse to further health goals. Particular attention will be paid to recognition of types of resistance, both of the patient and the nurse.

*Credit—two hours.*  
Thurs., 7:10-8:50 p.m.

\*Does not carry Graduate credit.

*College of*  
ENGINEERING



# Aims and Objectives

The College of Engineering shares with the other schools and colleges of the University the primary responsibility to preserve and increase knowledge through teaching, scholarship, and research. It has as more specific objectives:

- a) To prepare undergraduate engineers who are well versed in the engineering and related sciences and able to apply the principles of these sciences to new situations, who are cognizant of the meaning of professional life, and able and eager to accept the responsibilities of professional status, and who are aware of both the world in which they live, and of their duties and obligations to the complex society of which they are a part.
- b) To educate students at the graduate level for teaching, research, or advanced engineering positions in industry, and, as a corollary, to provide in the Engineering College the proper atmosphere in which to educate undergraduate engineers.
- c) To foster active research programs designed to teach graduate students the aims and methods of research, to provide a stimulating and challenging atmosphere for both students and faculty, and to add to the store of human knowledge.
- d) To serve the local and national communities by providing opportunities for part-time study, and to make available the consulting and research resources of the College to help solve problems appropriate to these resources.

## The Courses in Engineering

THE FOUR-YEAR ACCREDITED COURSES IN CHEMICAL AND MECHANICAL ENGINEERING, AND THE NEWLY OFFERED COURSE IN ELECTRICAL ENGINEERING, all of which lead to the Bachelor of Science degree, devote over one-fifth of the curriculum time to work in the humanities and social sciences and the remainder to the basic sciences and specialized engineering studies. Each curriculum is built upon a foundation of mathematics, physics, chemistry and basic engineering studies. The emphasis is placed upon a thorough understanding of the fundamental principles of science and engineering, rather than on a detailed knowledge of specific engineering practice. The aim is to motivate and prepare the engineering graduate for continued learning—either in industrial employment or other professional engineering service, or in study beyond the Bachelor's degree.

Although these undergraduate programs are normally completed in four academic years, a student in engineering may extend his undergraduate work over a five-year period. The additional time may be used to broaden his formal education by including additional courses in the liberal arts or in the sciences. A student wishing to follow such a program should consult with his Faculty Adviser toward the end of his freshman year. Approval is required from the Faculty Adviser and the Department Chairman, and the proposed program must meet, during each of five years, the normal minimum load requirements. (See also the next page concerning five-year, two-degree courses).

THE METALLURGICAL OPTION in Chemical or Mechanical Engineering affords the student following either of these programs the opportunity to gain considerable theoretical knowledge and laboratory experience in the field of physical metallurgy.

Students in mechanical engineering may follow the metallurgical option by taking ME 273, 274 and 275 as their senior elective courses. In the case of chemical engineers a special rearrangement of electives is required, and the choice must be made before the end of the sophomore year. Physical metallurgy is concerned with the fabrication, control of properties, and application of the common industrially important metals and alloys. The option provides a valuable adjunct to the mechanical or chemical engineering programs.

FIVE-YEAR, TWO-DEGREE COURSES IN ENGINEERING AND LIBERAL ARTS are being elected by an increasing number of students. These courses, which lead to both the B.S. and A.B. degrees, include all of the requirements for the single B.S. degree plus thirty-six hours of Arts electives in a chosen field of concentration. These combined curricula offer a worthwhile program which provides a much broader and more liberal education than is possible in the regular four-year course. The aim is to give the engineer a fuller appreciation of the social and economic responsibilities of his profession and to enable him to combine his engineering and non-engineering training in a wider field of effort. The choice between the four- and five-year courses should be made toward the end of the freshman year, and must have the approval of the Faculty Adviser as well as the cognizant Engineering and Liberal Arts Department Chairmen.

ADMISSION POLICY. To be admitted to the College of Engineering, a student must:

- a) have completed the freshman and sophomore courses of the appropriate Departmental synopsis or equivalent work satisfactory to the College.
- b) have a point-hour ratio of at least 2.00 in the work specified in (a).
- c) have received a grade of C or better in each of the courses marked with an asterisk in the appropriate Departmental synopsis.
- d) satisfy the appropriate Department with regard to his professional promise, interest, and character.

Under certain circumstances, applicants not meeting all of the above requirements may be admitted as special or probationary students. The status of such students is subject to review at the end of each semester.

#### DISTRIBUTION REQUIREMENTS OF THE COLLEGE OF ENGINEERING

The distribution requirements of the College of Engineering are identical to those of the College of Arts and Science (see p. 83), with the following exceptions:

- a) Of the twenty-four hours required for distribution, at least six must be taken in Group I and six in Group II. The remaining twelve hours may be taken in either Group I or Group II.
- b) Psychology 101, 102—Introduction to Psychology, may be accepted as meeting the requirements for a Group II course.

#### COURSE SYNOPSES

Students following the Bachelor of Science programs in chemistry, physics, optics, and all branches of engineering take substantially the same courses dur-

ing their freshman year, and may change among these curricula with relative ease until the end of the first year. ROTC students majoring in engineering must take the appropriate Air Science or Naval Science courses of the freshman year in addition to the regular courses listed below.

Titles of 400-level courses which are open to undergraduate students by special arrangement are included with the undergraduate course descriptions; these advanced courses are described in the Graduate Studies Bulletin.

### Freshman Year

		HOURS	
		1st Term	2nd Term
Math. 100, 101	Introductory College Mathematics and Elementary Calculus	4	4
Chem. 121, 122 or Chem. 123, 124	General Chemistry	4	4
Phys. 101-102 or Phys. 107-108	General Inorganic Chemistry and Qualitative Analysis General Physics A Physics I	4	4
Eng. 101-102	English Composition	3	3
Ph. Ed. 101, 103	Physical Education	1	1
		<hr/>	<hr/>
		16	16

Chemical engineers must take Chem. 123, 124.

### CHEMICAL ENGINEERING

#### Sophomore Year

*Math. 150, 151 or *Math. 160, 161	Intermediate Calculus and Differential Equations Analytic Geometry, Calculus and Differential Equations	4	4
*Physics 111-112 or *Physics 117-118	General Physics B Physics II	3	3
Chem. 161-162	Organic Chemistry	4	3
*Ch.E. 101	Introduction to Chemical Engineering	2	
*Ch.E. 112	Chem. Engineering Calculations		5
M.E. 101	Engineering Graphics I	3	
M.E. 105	Shop Practice		1
Elective	Group Elective <sup>1</sup>	3	3
Phys. Ed.	Physical Education	1	1
		<hr/>	<hr/>
		20	20

\*Must be passed with a grade of C or better.

#### Junior Year

Chem. 251, 252	Physical Chemistry	4	4
Chem. 213	Quantitative Analysis I	4	
Ch.E. 223, 224	Applied Thermodynamics	2	2
Ch.E. 243, 244	Chemical Engineering Principles	3	3
Ch.E. 294	Plant Visits		0
Electives	Group Electives <sup>1</sup>	6	6
M.E. 112	Statics and Strength of Materials		3
		<hr/>	<hr/>
		19	18

<sup>1</sup>At least one course (six hours) must be literature or second-year modern language course, and at least three credits of elementary economics must be included.

HOURS  
1st Term 2nd Term

<b>Summer</b>			
Ch.E. 245	Chemical Engineering Laboratory	3	
<b>Senior Year</b>			
Ch.E. 233, 234	Kinetics of Phys. and Chem. Processes	3	3
Elective <sup>3</sup>	Chemical Engineering Electives	3	3
Ch.E. 265, 266	Process Laboratory	1	1
Ch.E. 246	Kinetics Laboratory	1	
E.E. 157 <sup>2</sup>	Elementary Electrical Engineering I	3	
M.E. 271 <sup>2</sup>	Engineering Metallurgy for Chem. Engrs.		4
Ch.E. 294	Plant Visits		1
Elective <sup>1</sup>	Group Elective	3	3
Elective	Free Elective	3	3
		17	18

<sup>1</sup>At least one course (six hours) must be a literature or second-year modern language course, and at least three credits of elementary economics must be included.

<sup>2</sup>May be taken in the junior year in exchange for a group elective.

<sup>3</sup>Electives may be chosen from among ChE 210, 250, 263, 267, 270, 278, 280, 290, and 292 or ME 273, 274, 280 and 480. ChE 270, 290, or 292 must be included.

### COMBINED CHEMICAL ENGINEERING AND ROTC PROGRAM

ROTC students follow the regular curriculum above, except for the following changes:

#### NAVAL ROTC

##### Freshman Year

1. Add NAV 101, 102 to the courses regularly required.

##### Sophomore Year

1. Take NAV 151 and Psychology 102, Sec 92 or equivalent in place of six hours of group elective.

##### Junior Year

1. Take NAV 235 as overload; replace three hours of group electives by Nav. 222.

##### Senior Year

1. Take NAV 231, 232 as overload.

#### AIR FORCE ROTC

##### Freshman Year

1. Add AIR 101, 102 to the courses regularly required.

##### Sophomore Year

1. Add AIR 111, 112 and remove M.E. 101.

##### Junior Year

1. Replace six hours of group elective by AIR 201, 202.
2. Take Hist. 101-102 or Pol. Sci. 101-102 as a group elective.

##### Senior Year

1. Add AIR 211, 212 and M.E. 101.
2. Take Geo. 208 and Hist. 281 or Pol. Sci. 251 as group electives.
3. Use 6 hours of free elective for group elective subjects.

**PROGRAM FOR STUDENTS WHO ENTERED COLLEGE IN  
SEPTEMBER 1958, OR EARLIER**

**Junior Year**

	HOURS	
	<i>1st Term</i>	<i>2nd Term</i>
Chem. 213 .....	4	
Chem. 251, 252 .....	4	4
Ch.E. 221 .....	3	
Ch.E. 111 .....	4	
Ch.E. 241 .....		4
M.E. 111 .....		3
Electives .....	3	6
M.E. 105 .....		1
	—	—
	18	18

**Summer Laboratory**

Ch.E. 247 .....	2
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**Senior Year**

Ch.E. 248 .....	2	
Ch.E. 231, 261 .....	3	3
Ch.E. 242 .....	3	
Ch.E. 265 .....		2
Ch.E. 222 .....		3
Ch.E. 270 .....		3
Ch.E. 290 .....		3
E.E. 157, 158 .....	3	3
M.E. 113 .....	3	
Elective .....	3	
	—	
	17	17

Faculty or departmental advisers should be consulted for information concerning combined engineering-ROTC programs.



## ELECTRICAL ENGINEERING

### Sophomore Year

		HOURS	
		1st Term	2nd Term
*Math. 160, 161 or Math. 150, 151	Analytic Geometry, Calculus and Differential Equations	4	4
*Physics 117, 118 or Physics 111, 112	Intermediate Calculus and Differential Equations Physics II	4	4
*E.E. 139, 140	General Physics B	3	3
Group Elective	Introduction to Circuit Analysis	3	3
M.E. 101	Engineering Graphics	3	0
M.E. 112	Statics and Strength of Materials	0	3
Phys. Ed.	Physical Education	1	1
		18	18

### Junior Year

Math. 200, 201 <sup>1</sup>	Advanced Calculus, I and II	3	3
Physics 213	Introduction to Modern Physics	3	0
Optics 223	Electronic Properties of Solids	0	3
M.E. 250	Thermodynamics	3	0
E.E. 211	Linear Systems Analysis	0	3
E.E. 201, 202	Electrical Engineering Laboratory	4	4
E.E. 240, 241	Electronic Circuits, I and II	3	3
Group Elective		3	3
		19	19

\*Must be passed with a grade of C or better.

<sup>1</sup>Math. 262 or Math. 270 may be substituted for Math. 201.

### Senior Year

Physics 221, 222 <sup>1</sup>	Electricity and Magnetism	3	3
E.E. 203	Electrical Engineering Laboratory	4	0
E.E. Technical Elective		0	3
E.E. 251	Electromechanical Energy Conversion	3	0
E.E. 261	Communication System Engineering	0	3
Free Elective		3	3
Group Electives		6	6
		19	18

## COMBINED ELECTRICAL ENGINEERING AND ROTC PROGRAM

ROTC students follow the regular curriculum above, except for the following changes:

### NAVAL ROTC

#### Freshman Year

1. Add NAV 101, 102 to the courses regularly required.

#### Sophomore Year

1. Take NAV 151 and Psychology 102, sec 92 or equivalent in place of 6 hours of group electives.

<sup>1</sup>Optics 161—Electromagnetic Waves, and an E.E. technical elective (3 hrs.) may be substituted for Phys. 221, 222.

### Junior Year

1. Take NAV 235 as overload; replace the second term group elective by NAV 222.

### Senior Year

1. Take NAV 231, 232 as overload.

### AIR FORCE ROTC

#### Freshman Year

1. Add AIR 101, 102 to the courses regularly required.

#### Sophomore Year

1. Add AIR 111, 112 to the courses regularly required.
2. Take Hist. 101-102 or Pol. Sci. 101-102 as group electives.

#### Junior Year

1. Replace group electives by AIR 201, 202.

#### Senior Year

1. Add AIR 211, 212 to the courses regularly required.
2. Take Geo. 208 and Hist. 281 or Pol. Sci. 251 for 6 hours of group electives.

## MECHANICAL ENGINEERING

### Sophomore Year

		HOURS	
		<i>1st Term</i>	<i>2nd Term</i>
Math. 105, 151 or Math. 160, 161	Intermediate Calculus and Differential Equations	4	4
Physics 111-112 or Physics 117-118	Analytic Geometry, Calculus and Differential Equations General Physics B	3	3
M.E. 101	Physics II	3	0
M.E. 102	Engineering Graphics	0	3
M.E. 112	Graphic and Kinematic Analysis	0	3
M.E. 104	Statics and Strength of Materials	2	0
Electives <sup>1</sup>	Shop	6	6
Ph. Ed. 111, 113	Physical Education	1	1
		<hr/>	<hr/>
		19	20

### Junior Year

M.E. 229	Kinematics	2	0
M.E. 231	Fluid Mechanics	3	0
M.E. 232	Dynamics	0	3
M.E. 250, 251	Thermodynamics	3	3
M.E. 270, 272	Physical Metallurgy	3	3
M.E. 276, 277	Physical Metallurgy and Strength of Materials Laboratory	1	2
E.E. 139, 140	Introduction to Circuit Analysis	3	3
E.E. 161, 162	Electrical Laboratory	1	1
Elective <sup>1</sup>		3	3
		<hr/>	<hr/>
		19	18

HOURS  
1st Term 2nd Term

**Senior Year**

M.E. 236	Advanced Mechanics of Materials	3	0
M.E. 243	Machine Design	0	4
M.E. 254	Energy Conversion and Transfer	3	0
M.E. 257, 258	Mechanical Engineering Laboratory	3	3
Technical Electives		3	6
Electives <sup>1</sup>		6	6
		18	19

<sup>1</sup>Of the 30 hours of electives in the program, 24 must be used to satisfy the distribution requirements. (See p. 83) The remaining 6 hours may be used to provide additional breadth, or may be combined with the 9 hours of technical electives to afford a degree of concentration in some phase of engineering. The option in metallurgy, or programs concentrating in mechanics and design, thermodynamics and heat engineering, or electromechanical engineering are examples. Departmental advisers will assist students in selecting the electives best suited to their needs and interests.

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**COMBINED MECHANICAL ENGINEERING AND ROTC PROGRAM**

ROTC students follow the regular curriculum above, except for the following changes:

**NAVAL ROTC**

**Freshman Year**

1. Add NAV 101, 102 to the courses regularly required.

**Sophomore Year**

1. Take NAV 151 and Psychology 102, sec 92 or equivalent in place of 6 hours of electives.

**Junior Year**

1. Take NAV 235 as overload; replace the second term elective by NAV 222.

**Senior Year**

1. Take NAV 231, 232 as overload.

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**AIR FORCE ROTC**

**Freshman Year**

1. Add AIR 101, 102 to the courses regularly required.

**Sophomore Year**

1. Add AIR 111, 112 to the courses regularly required.
2. Take Hist. 101-102 or Pol. Sci. 101-102 for 6 hours of electives.

**Junior Year**

1. The elective is replaced by AIR 201, 202.

**Senior Year**

1. Add AIR 211, 212 to the courses regularly required.
2. Take Geo. 208 and Hist. 281 or Pol. Sci. 251 for 6 hours of electives.

**PROGRAM FOR STUDENTS WHO ENTERED COLLEGE IN  
SEPTEMBER, 1958, OR EARLIER**

**Junior Year**

	HOURS	
	<i>1st Term</i>	<i>2nd Term</i>
M.E. 270, 272 .....	3	3
M.E. 231, 232 .....	3	3
M.E. 230, 240 .....	4	4
M.E. 250, 251 .....	3	3
M.E. 211 .....	0	2
E.E. 159, 160 .....	4	4
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	17	19

**Senior Year**

M.E. 254 .....	3	0
M.E. 257, 258 .....	3	3
M.E. 242 .....	0	3
E.E. 177 .....	2	0
Technical Elective .....	3	6
Elective .....	6	6
	<hr style="width: 100%; border: 0.5px solid black;"/>	<hr style="width: 100%; border: 0.5px solid black;"/>
	17	18

Faculty or departmental advisers should be consulted for information concerning combined engineering-ROTC programs.

# The Administrative Officers

Dean.....

*John William Graham, Jr., D.Sc.*  
205 Gavett Hall

Associate Dean for Graduate Studies

*Lewis Dalcin Conta, Ph.D.*  
204 Gavett Hall

## Faculty

- John William Graham, Jr., D.Sc.** (Carnegie Institute of Technology)  
Dean of the College of Engineering
- Lewis Dalcin Conta, Ph.D.** (Cornell)  
Professor of Mechanical Engineering
- Daniel Ward Healy, Jr., Ph.D.** (Harvard)  
Professor of Electrical Engineering
- Horace William Leet, M.E.** (Cornell)  
Professor Emeritus of Mechanical Engineering
- Martin Lessen, Sc.D.** (Massachusetts Institute of Technology)  
Professor of Mechanical Engineering
- Shelby Alexander Miller, Ph.D.** (Minnesota)  
Professor of Chemical Engineering
- Gouq-Jen Su, Sc.D.** (Massachusetts Institute of Technology)  
Professor of Chemical Engineering
- Gerald Howard Cohen, Ph.D.** (Wisconsin)  
Associate Professor of Electrical Engineering
- Richard Frederick Eisenberg, M.S.** (Rochester)  
Associate Professor of Mechanical Engineering
- Hugh Guthrie Flynn, Ph.D.** (Harvard)  
Associate Professor of Electrical Engineering
- Richard Reist Kraybill, Ph.D.** (Michigan)  
Associate Professor of Chemical Engineering
- Oscar Edward Minor, B.S.** (Rochester)  
Associate Professor of Mechanical Engineering
- Rubens S. Ramalho, Ph.D.** (Vanderbilt)  
Associate Professor of Chemical Engineering
- Helmut D. Weymann, Dr.Sc.** (Aachen)  
Associate Professor of Mechanical Engineering
- William Frederick Halbleib, M.S.** (Rochester)  
Assistant Professor of Mechanical Engineering
- Stanley Middleman, B.E.S.** (Johns Hopkins)  
Assistant Professor of Chemical Engineering
- William David Smith, Jr., M.Eng.** (Yale)  
Assistant Professor of Chemical Engineering
- Hing-Cheong So, Ph.D.** (Illinois)  
Assistant Professor of Electrical Engineering
- William Richard Stroh, Ph.D.** (Harvard)  
Assistant Professor of Electrical Engineering
- Robert A. Ellson, B.M.E.** (City College)  
Instructor in Mechanical Engineering
- \***Thomas Jerome Harris, M.S.** (Rochester)  
Instructor in Electrical Engineering
- \***Gordon Dale Hiatt, Ph.D.** (Illinois)  
Lecturer in Chemical Engineering
- \***Burton Cosden Gibbons, B.S.Ch.E.** (Carnegie Institute of Technology)  
Assistant Lecturer in Chemical Engineering
- \***David Kenneth Priest, Ph.D.** (Ohio State University)  
Assistant Lecturer in Chemical Engineering
- \***James Livingston Douglas, M.S.** (Rochester)  
Assistant Lecturer in Electrical Engineering

\*Part-time.

# Chemical Engineering

Professors MILLER, SU; Associate Professors KRAYBILL, RAMALHO;  
Assistant Professors MIDDLEMAN, SMITH; Lecturer \*HIATT;  
Assistant Lecturers \*GIBBONS, \*PRIEST and Assistants.

**ChE 101. *Introduction to Chemical Engineering.*** An introduction to the character of chemical engineering practice and to the process industries served by chemical engineers. The application of mathematics, of conservation laws, and of communication skills to the solution of engineering problems and the presentation of engineering information will be emphasized. Mathematics 101 or 110 prerequisite.

*Credit—two hours.*  
Two lecture-recitations a week.  
Mr. Miller

**ChE 111. *Industrial Chemical Calculations.*** Quantitative applications of such physical and chemical principles as energy and material balance, thermochemistry and elementary thermodynamics, solubility, vapor pressure, and the principles of measurement. Problem analysis and problem solution are emphasized. Physics 101 or 107 and Mathematics 150 or 160 prerequisite.

*Credit—four hours.*  
Three lecture-recitations and one three-hour laboratory a week.  
Mr. Miller, Mr. Smith, and assistants

**ChE 112. *Chemical Engineering Calculations.*** Quantitative applications of such physical and chemical principles as material balance, the first law of thermodynamics, simple physical equilibrium, and the principles of measurement. Problem analysis, problem solution, and the practical application of mathematics are emphasized. Chem 124, Math 150 or 160, Phys 102 or 108, and ChE 101 prerequisite.

*Credit—five hours.*  
Four lecture-recitations and one three-hour laboratory a week.  
Mr. Kraybill, Mr. Ramalho, and assistants

**ChE 210. *Calculation Techniques.*** Applications of statistics, numerical methods, computers, and differential equations to chemical engineering problems. Math 151 or 161 and ChE 244 are prerequisite.

*Credit—three hours.*  
Three lecture-recitations a week.

\*Part-time.

**ChE 221. *Introduction to Thermodynamics.*** A study of the fundamental principles covering the first and second laws of thermodynamics. The transition of energy and the relationships existing among the several thermodynamic properties of matter are quantitatively treated and applied to practical engineering problems.

*Credit—three hours.*  
Three lecture-recitations a week  
Mr. Su

**ChE 222. *Thermodynamics for Chemical Engineers.*** A treatment of thermodynamic principles with particular reference to the second and third laws. Applications are made to miscellaneous mechanical and chemical processes, special emphasis being given to gas liquefaction and chemical equilibria involving both ideal and non-ideal systems. ChE 221 prerequisite.

*Credit—three hours.*  
Three lecture-recitations a week.  
Mr. Ramalho

**ChE 223. *Applied Thermodynamics I.*** A study of the first and second laws of thermodynamics, and quantitative treatment of the relationships existing among the several thermodynamic properties of matter. Applications of the first law, particularly to systems of real gases and vapors. Math 151 or 161 and Phys 112 or 118 prerequisite and Chem 251 corequisite.

*Credit—two hours.*  
Two lecture-recitations a week.

**ChE 224. *Applied Thermodynamics II.*** A continuation of ChE 223, with particular reference to the Second Law and to chemical processes. ChE 223 prerequisite.

*Credit—two hours.*  
Two lecture-recitations a week.

**ChE 231. *Applied Kinetics and Reactor Design.*** A review of chemical kinetics, followed by a study of the methods of kinetic data collection, analysis, and interpretation. Simple reactor designs are calculated. Emphasis is on homogeneous uncatalyzed reactions, but

heterogeneous and catalyzed reactions are considered. Chem 252 and ChE 241 prerequisite.

*Credit—three hours.*  
Three lectures a week.  
Mr. Miller

**ChE 233. Kinetics of Physical and Chemical Processes I.** Diffusion theory is reviewed, and theoretical and empirical rate equations describing diffusive mass transfer processes are studied. Illustrations will be drawn from unit operations. Chemical kinetics also is reviewed, and methods of interpreting kinetic data are explored. Chem 252, ChE 224 and ChE 244 prerequisites.

*Credit—three hours.*  
Three lectures a week.

**ChE 234. Kinetics of Physical and Chemical Processes II.** A continuation of ChE 233. Calculations for the design of chemical reactions and mass transfer equipment will be developed and practiced. Boundary-layer theory is introduced, followed by a unified treatment of transport processes. ChE 233 prerequisite.

*Credit—three hours.*  
Three lectures a week.

**ChE 241. Unit Operations I.** The theory and application of the unit operations of chemical engineering through the solution of problems in fluid flow, heat transmission, evaporation, and mechanical separation processes. ChE 111 and 221 prerequisite.

*Credit—for hours for undergraduate students and three hours for graduate students.*

Three lecture-recitations and one three-hour laboratory a week.  
Mr. Middleman and assistants

**ChE 242. Unit Operations II.** A continuation of ChE 241, studying diffusional processes of absorption and extraction, distillation, psychrometry, air conditioning, and drying. ChE 241 prerequisite.

*Credit—three hours.*  
Three lecture-recitations a week.  
Mr. Kraybill, Mr. Middleman

**ChE 243. Chemical Engineering Principles I.** The theory of the chemical engineering unit operations, with special attention to fluid mechanics and the mechanics and behavior of particulate solids. ChE 101 is prerequisite and Chem 151 is corequisite.

*Credit—three hours.*  
Three lecture-recitations a week.

**ChE 244. Chemical Engineering Principles II.** A continuation of ChE 243. Heat transfer, applications of physico-chemical equilibrium,

and staged operations are treated. ChE 243 is prerequisite.

*Credit—three hours.*  
Three lecture-recitations a week.

**ChE 245. Chemical Engineering Laboratory.** Demonstration of certain of the unit operations and of the physical principles of chemical engineering. Data taking, equipment operation, and methods of data calculation and correlation are practiced. Experience in writing effective technical reports is an important part of the course. Chem 213 and 242 are prerequisite.

*Credit—three to four hours.*  
Equivalent of nine to twelve hours a week.

**ChE 246. Kinetics Laboratory.** A continuation of ChE 245. The experiments demonstrate chemical-reaction and mass-transfer rates. ChE 233 is corequisite.

*Credit—one hour.*  
One three-hour laboratory a week.

**ChE 247. Chemical Engineering Laboratory.** Experimental studies in filtration, flow of heat, refrigeration, evaporation, and internal combustion engines. The student has an opportunity to apply fundamental engineering and thermodynamic principles to actual process operations, to become familiar with equipment performance, and to gain experience in writing effective technical reports. ChE 241 prerequisite.

*Credit—two hours.*  
One three-hour laboratory each week.  
Mr. Miller and assistants

**ChE 248. Chemical Engineering Laboratory.** This course is similar in nature to ChE 247, except that studies in extraction, distillation, humidification, drying, absorption, and materials testing are undertaken. Must be taken with or subsequent to ChE 242.

*Credit—two hours.*  
One three-hour laboratory per week.  
Mr. Kraybill, Mr. Middleman, and assistants

**ChE 250. Selected Unit Operations.** A study of some of the chemical engineering unit operations. The fundamentals of chemical engineering are applied, and design and operation are treated, with special attention being devoted to certain of the particularly mechanical operations. ChE 244 prerequisite.

*Credit—three hours.*  
Three lectures a week.

**ChE 263. The Chemistry of Plastic Materials.** The sources of chemical raw materials and the conversion of these materials to resins will be discussed. The general principles of

polymer formation will be laid down. Each important class of plastic materials will be described with reference to methods of manufacture, compounding and molding. Emphasis will be placed on the physical properties of materials and the variation of these properties with plastic composition.

*Credit—two hours.*  
Two lectures a week.  
Mr. Hiatt

**ChE 265. *Process Laboratory.*** Simple process development campaigns in which kinetic data are obtained and process conditions are investigated and established. Each campaign culminates in a reactor design. The approach to the multi-variable experiment is demonstrated. ChE 231 prerequisite.

*Credit—one or two hours.*  
One or two three-hour laboratories a week.  
Mr. Miller and assistants

**ChE 266. *Process Laboratory.*** A continuation of ChE 265. ChE 265 prerequisite.

*Credit—one hour.*  
One three-hour laboratory a week.

**ChE 267. *Industrial Chemical Technology.*** Analysis of industrial chemical processes with attention to chemical principles, chemical engineering practice, and economic factors. Such topics as raw material and energy sources, water treatment, and waste processing are included, as well as selected organic and inorganic processes. Chem 161 and 251 prerequisite and ChE 233 corequisite.

*Credit—three hours.*  
Three lectures a week.  
Mr. Su

**ChE 270. *Chemical Engineering Process Design.*** This course is essentially an opportunity for the chemical engineering senior to integrate the material he has mastered in his several previous science and engineering courses. In general, problems related to the design of chemical plants, including economic as well as technical considerations, are treated. Specifically, these problems include structural design, piping design, flow sheet layout, plant layout, economic balance, instrumentation and automatic control, and comprehensive equipment and process design. ChE 242 prerequisite.

*Credit—three hours.*  
Three lecture-recitations a week.  
Mr. Kraybill, Mr. Ramalho

**ChE 278. *The Chemical Industry and Its Operation.*** A brief review of the history of chemical technology and the emergence of

the modern chemical industry, followed by a study of the organization, financing, and economic profile of the process industries. Special attention is given to the interplay between technical and economic factors and to the exercise of the managerial function with respect to them, particularly in the organization and management of research and development. The current status of patent practice will be summarized.

*Credit—two hours.*  
Two lectures a week.  
Mr. Miller

**ChE 280. *Process Control and Instrumentation.*** A review of the principles of measurement is followed by a survey of established techniques for measuring and controlling process variables. The selection and engineering of instruments for the chemical process industries are studied.

*Credit—three hours.*  
Three lectures a week.

**ChE 290. *Special Topics.*** A senior seminar course in which current practices and current research developments in chemical engineering are explored. Those students who are of particular technical aptitude concentrate on advanced topics of theoretical and technical character; others concentrate on design practice, engineering economics and cost considerations, and plant practice. ChE 242 and 231 prerequisite.

*Credit—three hours.*  
Two seventy-five minute meetings a week.  
Staff

**ChE 292. *Chemical Engineering Projects.*** The student is placed on his own initiative in the pursuit of an original problem related to chemical engineering. Experimental work usually is involved. Proper planning of the project and presentation of results are important features of the course. Only highly qualified students may enroll. ChE 24 is prerequisite and consent of the Department is required.

*Credit—one to six hours.*  
Staff

**ChE 294. *Plant Visits.*** Appropriate industrial plants that illustrate chemical engineering in practice are visited. The visits are preceded by explanation and followed by discussion, and a final report is required of each student.

*Credit—one-half hour.*

**ChE 410. *Engineering Calculations.***  
*Credit—three hours.*

ChE 421. *Advanced Chemical Engineering Thermodynamics.*

*Credit—three hours.*

ChE 431. *Chemical Engineering Kinetics and Catalysis.*

*Credit—three hours.*

ChE 441. *Fluid Flow and Heat Transmission.*

*Credit—three hours.*

ChE 442. *Diffusional Operations.*

*Credit—three hours.*

ChE 451. *Filtration.*

*Credit—two hours.*

ChE 452. *Mixing.*

*Credit—two hours.*

ChE 481. *Corrosion.*

*Credit—two hours.*

## Electrical Engineering

Professor HEALY; Associate Professors COHEN, FLYNN; Assistant Professors SO, STROH; Instructor \*HARRIS; Assistant Lecturer \*DOUGLAS, and Assistants.

### EE 139. *Introduction to Circuit Analysis I.*

The theory of linear, passive, lumped-parameter networks. Network topology, general network theorems, general equilibrium equations, node and mesh analysis, and singularity functions. Physics 108 (or 102), Mathematics 111 (or 101) prerequisite.

*Credit—three hours.*

Three lectures a week.

### EE 140. *Introduction to Circuit Analysis II.*

A continuation of EE 139: Natural response of networks, sinusoidal steady state, introduction to pole-zero concepts, power and energy, and coupled circuits. EE 139 prerequisite.

*Credit—three hours.*

Three lectures a week.

### EE 157. *Elementary Electrical Engineering I.*

A basic course for chemical engineers covering elements of circuit theory, an introduction to electrical measurements, and electronic devices or power machinery. Physics 112 and Math 161 prerequisite.

*Credit—three hours.*

Three lectures a week and one laboratory period on alternate weeks.

### EE 158. *Elementary Electrical Engineering II.*

A continuation of EE 157 designed to complement and extend the coverage of that course in electrical engineering subjects. EE 157 prerequisite.

*Credit—three hours.*

Three lectures a week and one laboratory period on alternate weeks.

EE 161, 162. *Electrical Laboratory.* A laboratory course for mechanical engineers in-

cluding selected experiments in basic measurements, circuit components, electric networks, electronic devices, and power transformers and machinery. EE 139, 140 must be taken concurrently.

*Credit—one hour.*

One laboratory period a week.

### EE 201, 202, 203. *Electrical Engineering Laboratory.*

A general laboratory course for electrical engineers. EE 201 covers dc and ac measurements by deflection and null meth-

\* Part-time.



ods, the elementary characteristics of vacuum tubes and transistors, and linear amplifiers. EE 202 includes more complex electronic circuits, such as oscillators, pulse and timing circuits, modulators, and detectors. EE 203 is devoted to dc and ac machinery, transformers, magnetic amplifiers, torque motors and electro-acoustic devices, and special projects.

*Credit—four hours per course.*

One recitation and two laboratory periods a week.

**EE 206. Transistor Characteristics and Circuits.** A study of the physical characteristics of semiconductor devices, particularly junction transistors, and the analysis and design of transistor circuits emphasizing those illustrating the unique properties of the transistor. EE 241 prerequisite.

*Credit—three hours.*

Three lectures a week.

**EE 209. Acoustics.** An introduction to acoustics. The acoustic wave equation, plane and spherical waves, radiation from sound sources, propagation in horns and tubes, electro-acoustic devices. Math 201 prerequisite.

*Credit—three hours.*

Three lectures a week.

**EE 211. Linear Systems Analysis.** The formulation and solution of the integro-differential equations which describe linear physical systems, including mechanical and electromechanical as well as electrical systems. Transform methods, particularly Fourier and Laplace transforms, are introduced and applied to physical problems. Math 151 or 161 prerequisite.

*Credit—three hours.*

Three lectures a week.

**EE 240. Electronic Circuits I.** A first course in active networks. The common characteristics of active three-terminal devices are developed and applied. Topics include rectifiers, thyratrons, small signal parameters of active devices, piecewise linear analysis and graphical constructions. EE 139-140 prerequisite.

*Credit—three hours.*

Three lectures a week.

**EE 241. Electronic Circuits II.** A continuation of EE 240, including single-stage and cascaded amplifiers, feedback, stability, frequency compensation, oscillators, and trigger circuits. EE 240 prerequisite.

*Credit—three hours.*

Three lectures a week.

**EE 245. Feedback Control Systems.** Theory of linear feedback system analysis and synthesis, and application of the theory to a variety of engineering fields. EE 211 and Math 201 prerequisite.

*Credit—three hours.*

Three lectures a week.

**EE 251. Electromechanical Energy Conversion.** An introduction to the theory of electromechanical energy conversion, with applications to dc and ac rotating machines and incremental motion devices (transducers). Physics 112, EE 140 prerequisite.

*Credit—three hours.*

Three lectures a week.

**EE 261. Communication System Engineering.** The study of basic communication systems including their components, bandwidth requirements and limitations, the principles of modulation and detection, and elements of information theory and noise phenomena.

*Credit—three hours.*

Three lectures a week.

**EE 271. High-Frequency Engineering.** A study of phenomena associated with and characterized by high-frequency operation. Topics include the methods of producing high frequencies by magnetrons and klystrons, traveling wave tubes, the transmission of high-frequency energy by conventional transmission lines, coaxial lines, and wave guides, and the transmission and reception of electromagnetic radiation in space. Physics 221, Math 201 prerequisite.

*Credit—four hours.*

Three lectures and one

laboratory period a week.

**EE 401. Computer Electronics.**

*Credit—three hours.*

**EE 402. Analog and Digital Computers.**

*Credit—three hours.*

**EE 420. Engineering Applications of Functions of a Complex Variable.**

*Credit—three hours.*

**EE 421. Electromagnetic Engineering.**

*Credit—three hours.*

**EE 422. Boundary Value Problems.**

*Credit—three hours.*

**EE 431. Advanced Network Analysis.**

*Credit—three hours.*

# Mechanical Engineering

Dean GRAHAM; PROFESSORS CONTA, LESSEN; ASSOCIATE PROFESSORS EISENBERG, MINOR, WEYMANN; ASSISTANT PROFESSOR HALBLEIB; INSTRUCTOR ELLSON, and Assistants; Shop, Mr. PEARSE, Mr. BEACH.

**ME 101. *Engineering Graphics.*** A study of orthographic projection as a tool in solving problems in space, and also as the basis of communication among technically trained persons. Topics included are: graphs, sectioning, conventions, dimensions, pictorials, assemblies, intersections, developments, along with "double auxiliary" methods of graphic solutions.

*Credit—three hours.*

Two lectures and four hours of laboratory a week.  
Mr. Minor and assistant

**ME 102. *Graphic and Kinematic Analysis.*** Further application of "descriptive geometry" techniques in solving problems in space and in vector polygons. A study of graphical calculus; kinematics of cams and gears; instant centers; introduction to engineering report writing. ME 101, Physics 111 prerequisite.

*Credit—three hours.*

Two lectures and four hours of laboratory a week.  
Mr. Minor and assistant

**ME 104. *Machine Shop.*** A course emphasizing standard machines and tools from the standpoint of their possibilities in performing various types of work. It is the aim of this course to acquaint the student with the abilities and limitations of modern machine tools, rather than to produce skilled machinists.

*Credit—two hours.*

One lecture, five hours shop work a week.  
Mr. Pearse, Mr. Beach

**ME 105. *Shop Practice.*** For chemical engineers. Simple machine tool operations, with demonstrations and practice in sheet metal working, soldering, welding, and pipe fitting, and lecture and plant visits in pattern making and foundry practice.

*Credit—one hour.*

One lecture, two hours shop work a week.  
Mr. Pearse, Mr. Beach

**ME 111. *Applied Mechanics.*** A condensed course in mechanics for chemical engineers. Covers static force systems; treats kinematics briefly; deals with kinetics of plane motion; and ends with a short treatment of work and energy, and impulse and momentum. Mathematics 151 prerequisite.

*Credit—three hours.*

Three hours a week.  
Mr. Ellson

**ME 112. *Statics and Strength of Materials.*** The principles of statics are reviewed, and applied to problems of engineering interest. The basic theories of strength of materials are covered—including properties of materials, axial loading, flexure, torsion, buckling, and combined stresses. Math 150, Physics 111 prerequisite.

*Credit—three hours.*

Three lectures a week.  
Mr. Halbleib

**ME 113. *Mechanics of Materials.*** Mechanics of deformable elastic solids. Basic theories of strength of materials presented and applied to important engineering problems. Topics covered include study of properties of materials, biaxial stress analysis, bending and torsion, elastic stability, and fatigue of metals. ME 10 or ME 111 prerequisite.

*Credit—three hours.*

Three lecture-recitations per week.  
Mr. Ellson

**ME 211. *Materials Laboratory.*** Tests of engineering materials are made with emphasis on application of theories of failure. Use is made of photoelastic and wire resistance strain gage methods in the study of design problems. ME 113 prerequisite.

*Credit—two hours.*

One lecture and one three-hour laboratory period each week.  
Mr. Minor and assistants

**ME 229. *Kinematics.*** A study of motion, emphasizing analytic treatment of displacement,

velocity and acceleration in various linkages. The use of velocity and acceleration polygons as a graphic procedure. Fundamentals of speed changers, including gears and gear trains. Prerequisite: ME 102, Physics 111.

*Credit—two hours.*  
Two lectures a week.

**ME 230. Kinematics of Machinery.** Free and constrained motion; methods of transmitting motions in machines; belt linkages, cams, frictional and toothed gearing and gear trains; velocity and acceleration of machine members. ME 110 prerequisite.

*Credit—four hours.*  
Two recitations, two three-hour periods a week.

**ME 231. Fluid Mechanics.** A study of the properties of fluids and the theory of fluid flow systems. The course includes dimensional analysis, and makes use of models where possible. A brief treatment of the thermodynamics of compressible flow is given. Math 151, Physics 112 prerequisite, ME 250 must be taken concurrently.

*Credit—three hours.*  
Three lectures a week.

**ME 232. Dynamics.** Principles of dynamics, study of equations of motion, and concepts of force, energy, impulse and momentum. Complete force studies of complex machines. Balancing and critical speeds. Math 151 and ME 230 or 229 prerequisite.

*Credit—three hours.*  
Two one-hour recitations, one three-hour laboratory a week.  
Mr. Halbleib

**ME 234. Mechanical Vibrations.** Principles of harmonic motion; study of free, damped, and forced vibrations of single and multi-degree freedom systems; vibration theory applied to engineering problems. ME 232 prerequisite.

*Credit—three hours.*  
Three lecture-recitation periods a week.

**ME 236. Advanced Mechanics of Materials.** Three-dimensional systems of stresses and strains, and theories of failure of materials under static and dynamic conditions. The theories of elasticity, plates and shells, and elastic stability are introduced. ME 113, Math 151 prerequisite.

*Credit—three hours.*  
Three lectures a week.

**ME 240. Mechanics of Machines.** Analytic study of machines for the performance of definite work; determination of loads on ma-

chine members due to applied and inertia forces, friction, and gravity; choice of materials and proportioning of details to meet conditions of stress, economy, and manufacturing methods; provisions for adjustment, renewal, and lubrication; limitations of the theoretical principles of mechanics and the proper use of rational and empirical formulae in design. ME 113, 230 prerequisite.

*Credit—four hours.*  
Three lecture-recitations, one three-hour period a week.  
Mr. Minor

**ME 242. Structural Design.** A study of stresses involved in the design of trusses, girders, columns, and floor systems. Timber, steel and reinforced concrete structures are considered. Prerequisite: ME 113.

*Credit—three hours.*  
Three lectures a week.  
Mr. Graham

**ME 243. Machine Design.** Principles of strength of materials applied to various machine elements. Consideration of loads developed in machine members, and procedures for determining sizes, shapes and assembly. Prerequisite: ME 230, 232.

*Credit—four hours.*  
Three lectures, one three-hour laboratory a week.

**ME 250. Thermodynamics I.** A brief review of fundamental concepts, the first law, the ideal gas laws and calorimetry, followed by a study of the second law, entropy, and the properties of pure substances. An introduction to heat transfer, and a study of vapor power cycles completes the term. Physics 111, and Mathematics 150 prerequisite.

*Credit—three hours.*  
Three lectures a week.  
Mr. Weymann

**ME 251. Thermodynamics II.** The application of thermodynamic principles to a study of single phase and two phase mixtures, air conditioning, air compressors and expanders, internal combustion engines, and refrigeration processes. ME 250 prerequisite.

*Credit—three hours.*  
Three lectures a week.  
Mr. Weymann

**ME 254. Energy Conversion and Transfer.** A study of combustion and thermochemical calculations, and the transfer of heat and mass. ME 250 prerequisite.

*Credit—three hours.*  
Three lectures a week.  
Mr. Conta

**ME 255 and 256. Engineering Laboratory.** Selected experiments in the fields of materials testing, fluid flow and heat power. Open only to students in the Industrial Management Program, or by permission of the instructor. ME 53 and ME 60 prerequisites.

*Credit—two hours each term.*  
One laboratory period a week.  
Mr. Minor and assistants

**ME 257-258. Mechanical Engineering Laboratory.** Laboratory experiments in fluid flow, heat transfer, and power generation. The lecture period is used to discuss and demonstrate instrumentation, and as a preparation for the laboratory experiments. During the second term students are expected to demonstrate initiative and originality in the organization and conduct of the experiments. ME 251 prerequisite.

*Credit—three hours each term.*  
One lecture period and one laboratory period a week.  
Staff and assistants

**ME 259. Refrigeration and Air Conditioning.** The application of thermodynamics to the study of refrigeration and air conditioning cycles. Air, vapor, absorption, and steam jet refrigeration cycles are considered, as well as the equipment and controls to carry out these cycles. The principles of psychrometry are studied and their application to comfort and industrial air conditioning discussed. ME 60 prerequisite.

*Credit—three hours.*  
Two lecture-recitation periods a week and one laboratory period.  
Mr. Conta

**ME 260. Special Problems in Heat Power.** This course is intended for advanced students in mechanical engineering who wish instruction in topics in the heat-power field beyond the scope of the normal heat-power offerings within the mechanical engineering curriculum. The subject matter of the course will vary from year to year in accordance with the needs and interests of the class.

*Credit—three hours.*  
Three lecture-recitation periods a week.  
Mr. Conta

**ME 261. Gas Turbine Power Plants.** A study of the thermodynamics of gas turbine cycles, and of the machinery necessary to carry out these cycles. Consideration will be given to design and operation of the turbines and compressors, and to the problems involved in the combustion of fuels in high velocity air streams. Although the major em-

phasis will be on power turbines some time will be devoted to the jet propulsion of aircraft. ME 251 and ME 231 prerequisite.

*Credit—three hours.*  
Three lecture-recitation periods a week.  
Mr. Ellson

**ME 262. Gas Dynamics.** The mechanics and thermodynamics of compressible flow at subsonic and supersonic velocities. Shock phenomena as well as combustion and other thermal effects will be covered. Applications to flow in ducts, nozzles, diffusers, combustors, and impellers will be studied. Prerequisites: ME 231 and 254.

*Credit—three hours.*  
Three hours a week.  
Mr. Conta

**ME 263. Internal Combustion Engines.** A study of the thermodynamic cycles and principles of operation of spark and compression ignition engines and their auxiliaries. A careful consideration of ideal cycles and of the deviations of actual engines from the ideal will be followed by a study of fuel properties, carburetion and fuel injection, combustion and the control of detonation, engine performance, and engine systems. Laboratory experiments will demonstrate and supplement the principles studied in class. ME 251 prerequisite.

*Credit—three hours.*  
Two lecture-recitation periods and one laboratory period a week.  
Mr. Conta and assistants

**ME 270, 272. Physical Metallurgy.** A study of the fundamentals of physical metallurgy. Emphasis is placed on the structure of metals, phase diagrams, physical and mechanical properties, and heat treatment. Specific metals and metallurgical processes will not be covered except as a means of illustrating the principles. Chemistry 122, ME 113 prerequisite.

*Credit—three hours each term.*  
Three lectures a week.  
Mr. Eisenberg

**ME 273. Ferrous Alloys.** A detailed study of the iron carbon system, heat treatment, and the correlation of microstructures with associated properties of steels. Special purpose steels such as tool steels, stainless steels and high temperature alloys are also studied. The laboratory is devoted to metallography, heat treating and testing. Prerequisites: ME 272, 276, 277.

*Credit—three hours.*  
Two lectures and one laboratory a week.  
Mr. Eisenberg

**ME 274. Non-Ferrous Metals and Alloys.** A study of non-ferrous metals and alloys, associating properties with microstructure, composition, and thermal treatments. Recent developments, including nuclear metallurgy, are also considered. The laboratory work is devoted to metallography, heat treatment, and testing. Prerequisites: ME 272, 276, 277.

*Credit—three hours.*

Two lectures and one laboratory a week.

Mr. Eisenberg

**ME 275. Metallurgical Engineering Projects.**

The student will be placed on his own initiative and responsibility in the study of an original problem in some field of metallurgical engineering, involving library and laboratory work. A complete engineering report will be required covering the work undertaken. ME 272 prerequisite. Students not taking the Metallurgy option must have the consent of the instructor.

*Credit—three or four hours.*

Mr. Eisenberg

**ME 276, 277. Metallurgy Laboratory.** In the first term the laboratory work emphasizes

experimental techniques and equipment, including pyrometry, materials testing and metallography. In the second term the emphasis is on metallurgical operations and the application of the principles of physical metallurgy to specific metals and alloys. ME 271, 272 corequisite.

*Credit—one hour first term.*

*two hours second term.*

One laboratory a week.

Mr. Eisenberg

**ME 280. Introduction to Nuclear Engineering.**

An introductory course dealing briefly with a number of problems in the nuclear field. The course will draw extensively on the engineering student's earlier educational background. Topics studied are: introduction to nuclear physics; reactor components and analysis; materials of construction; power systems and controls; waste disposal and safety.

*Credit—three hours.*

Three lectures a week.

Mr. Conta and staff

**ME 290. Project Course for Mechanical Engineers.**

A project course for qualified seniors in which a specific investigation is carried out under the supervision of a member of the faculty. The work may involve the analysis, adaptation, or modification of equipment or it may be the development of equipment for a specific function.

*Credit—one, two, or three hours.*

Members of the engineering staff

**ME 430. Introduction to Elasticity and Plasticity I.**

*Credit—three hours.*

**ME 431. Introduction to Elasticity and Plasticity II.**

*Credit—three hours.*

**ME 436. Foundations of Fluid Mechanics I—Inviscid Flow.**

*Credit—three hours.*

**ME 437. Foundations of Fluid Mechanics II—Viscous Flows.**

*Credit—three hours.*

**ME 480. Nuclear Laboratory.**

*Credit—three hours.*



# *The School of* Business Administration

The School of Business Administration was established in 1958, to administer and further develop the professional degree programs in business administration introduced in 1945-46 in the College of Arts and Science and in the University School by the former Department of Economics and Business Administration. Particularly since World War II, growing interest has been shown in education leading to improved understanding of business and industry as well as to preparation for professional competency at the administrative level. The School seeks to provide business, industry and government with a strong and growing source of future managers, and also to qualify employed managers for enlarged responsibilities.



## PURPOSE

The objectives of the School of Business Administration are:

1. To improve understanding of the role of business in society, the function of the executive in business, and the forces and relationships conditioning their performance; and to foster the development of those values, insights and skills required to analyze, decide, and act effectively in the presence of new business experience.
2. To encourage and support research and publication.
3. To provide, in cooperation with the business and industrial community, special non-degree programs and services designed for employed managers wishing to improve their present performance or to increase their potential.

## DEGREE PROGRAMS OFFERED

The School administers programs of study leading to the degree Bachelor of Science, with majors in Accounting, Business Administration and Industrial Management, and to the degree Master of Science with a major in Business Administration.

Although the undergraduate student is not formally admitted to the School until the beginning of his junior year, the requirements for the Bachelor's degrees are stated in terms of four years of full-time study (or the equivalent in part-time study).

To permit more non-business electives in his junior and senior years, and to prepare more effectively for advanced course sequences in his major field, the full-time student initiates his study of business administration at the sophomore level. Depending upon their maturity and experience, part-time students may be permitted to elect preprofessional business courses even earlier in their program. All Bachelor's degree candidates continue to elect some liberal arts and science courses in their junior and senior years, and also may select general electives from other Colleges of the University.

## BACHELOR OF SCIENCE WITH A MAJOR IN BUSINESS ADMINISTRATION

The degree program in Business Administration consists of a well-balanced and coordinated group of liberal and professional studies designed to prepare the student for successful progress toward a rewarding and socially useful business career. Courses in the humanities, mathematics, natural sciences, and social sciences including economics comprise some 55 to 65 percent of the four-year program; professional education in business administration comprises most of the remainder. Ample flexibility in the choice of electives enables each student to adapt his program to his own needs and interests.

The professional studies consist principally of a core of business administration and allied courses which reflects both the breadth of preparation required for managerial responsibility and the high degree of interdependence of major business functions. This core includes (1) introductory courses in business fundamentals, basic accounting, and basic economics; (2) more intensive course work in business law, financial management, marketing, production management and statistics; and (3) two advanced courses which are designed to integrate the previous studies, and which are taught primarily by the case method. One

of these latter courses stresses human factors in administrative management and the other, the analysis and decision-making involved in comprehensive business problems.

Throughout the core curriculum, analysis of concrete business situations is stressed. In addition, field trips to industrial establishments, direct contact with visiting executives and, for some, participation in internship programs facilitate the adaptation of formal course study to business requirements.

The synopsis of the requirements for the Bachelor of Science degree with a major in Business Administration follows:

<b>I. Minimum Study in Business Administration</b> .....	<b>43 hours</b>
<b>A. Preprofessional Courses</b>	
GBA157 & GBA158, Fundamentals of Bus. Admin.....	6 hours
ACC153 & ACC154, Principles of Accounting.....	6 hours
<b>B. Required Core Courses</b>	
LAW203 & LAW204, Business Law; Contracts I & II....	4 hours
QNT205, Elementary Business Statistics .....	3 hours
FIN205, Financial Management .....	3 hours
MKT203, Marketing .....	3 hours
PRD208, Production Management .....	3 hours
GBA251, Administrative Principles & Practices .....	3 hours
GBA282, Business Policy .....	3 hours
<b>C. Business Administration Electives</b> .....	<b>9 hours</b>
<b>II. Minimum Study in Economics</b> .....	<b>15 hours</b>
Economics 101, 102, Principles of Economics .....	6 hours
Economics Electives .....	9 hours
<b>III. Minimum General Studies in Other Liberal Arts and Science</b> .....	<b>51-53 hours</b>
English 101-102, English Composition .....	6 hours
English 103-104, Introduction to Literature* .....	6 hours
Elective in Group I (Humanities) .....	6 hours
Laboratory Science .....	6-8 hours
Mathematics .....	7-8 hours
Social Sciences other than Economics .....	12 hours
Liberal Arts & Science Electives** .....	6-9 hours
<b>IV. General Electives (at least 6 hours must be in fields other than Business Administration)</b> .....	<b>13-15 hours</b>
<b>V. Physical Education*** or additional General Electives</b> .....	<b>4 hours</b>
<b>Total Minimum Required</b> .....	<b>128 hours</b>

In choosing his electives in business administration and economics, the student may emphasize either breadth of preparation for administration or a limited specialization in one functional area of business. A specialization ordinarily consists of at least twelve hours (four courses) in one of the following areas:

*Accounting:* Within the Business Administration major, specialization in accounting is designed to develop an awareness of standards and values required for significant managerial responsibility in areas where accounting concepts and practices are controlling.

\*English 111-112 or other literature courses may be substituted for English 103-104 with the consent of the College of Arts & Science and the School of Business Administration.

\*\*Students completing a four-year ROTC program may offer up to 6 hours of ROTC courses in partial fulfillment of the Liberal Arts Electives requirement.

\*\*\*To be admitted to the School of Business Administration, full-time students must present 4 hours of credit for Physical Education or a substitute—such as Military Science—acceptable to the Department of Physical Education.

*Finance:* Specialization in this area broadens and deepens the student's understanding of the finance function in business, of financial instruments and institutions, and of the economic forces and relationships which affect financial and investment management. It also develops further the student's powers of analysis and decision-making with respect to financial problems and financial reports.

*Marketing:* Those specializing in marketing will find emphasis on the use of resources to match demands and means of keeping our system of distribution adapted to expanded productive capacity and the over-all economy. Due in part to increasing production, the problems of distributing the goods and services being made available are increasing and are also becoming more complex. This has been evidenced by an increase in the number of people employed in distribution activities. The area of marketing provides opportunities for managers responsible for devising, improving and developing new techniques and policies for distribution.

*Production Management:* Specialization in this area encourages an appreciation of a production executive's responsibilities and an understanding of the issues, concepts and practices within this field.

## BACHELOR OF SCIENCE WITH A MAJOR IN ACCOUNTING

The degree program in Accounting is designed primarily for those interested in careers in public accounting or other fields where Certified Public Accountants are required or preferred. Completion of this program qualifies students for admission to the New York State C.P.A. examination.

Students who wish only to establish equivalency for the registered accounting curriculum at the University of Rochester and who have completed their basic degree in another institution, should obtain counselling from the School of Business Administration at the earliest opportunity and register with the Office of Admissions as special students.

The program combines intensive preparation in the field of accounting with a core of general business administration courses and with general education in the liberal arts and sciences. Consequently it includes more required courses and fewer elected than does the B.S. program in Business Administration. ROTC students can complete all of its requirements in four year, only if they attend one summer session.

The synopsis of the requirements for the Bachelor of Science degree with a major in Accounting follows:

<b>I. Minimum Study in Accounting</b> .....	<b>27 hours</b>
ACC153 & ACC154, Principles of Accounting .....	6 hours
ACC221 & ACC222, Cost Accounting .....	6 hours
ACC233, Intermediate Accounting .....	3 hours
ACC236, Advanced Accounting I .....	3 hours
ACC239, Advanced Accounting II .....	3 hours
ACC261, Auditing I .....	3 hours
ACC275, Income Tax Accounting I .....	3 hours
<b>II. Minimum Study in Other Areas of Business Administration</b> .....	<b>29 hours</b>
GBA157 & GBA158, Fundamentals of Bus. Admin. ....	6 hours
LAW203 & LAW204, Business Law; Contracts I & II.....	4 hours
LAW223, Law of Sales & Negot. Instr. ....	2 hours
LAW226, Agency Partnerships & Corp. ....	2 hours

QNT205, Elementary Bus. Statistics .....	3 hours	
FIN205, Financial Management .....	3 hours	
FIN256, Financial Analysis .....	3 hours	
MKT203, Marketing .....	3 hours	
PRD208, Production Management .....	3 hours	
<b>III. Minimum Study in Economics .....</b>		<b>12 hours</b>
Economics 101, 102, Principles of Economics .....	6 hours	
Economics 211, Money, Credit and Banking .....	3 hours	
Economics Elective .....	3 hours	
<b>IV. Minimum Study in Other Liberal Arts and Science .....</b>		<b>49-52 hours</b>
English 101-102, English Composition .....	6 hours	
English 103-104, Introduction to Literature* .....	6 hours	
Elective in Group I (Humanities) .....	6 hours	
Laboratory Science .....	6-8 hours	
Mathematics .....	7-8 hours	
Social Sciences other than Economics .....	12 hours	
Liberal Arts Electives .....	6 hours	
<b>V. General Electives** .....</b>		<b>4-7 hours</b>
<b>VI. Physical Education*** .....</b>		<b>4 hours</b>
<b>Total Minimum Required .....</b>		<b>128 hours</b>

\*English 111-112 or other literature courses may be substituted for English 103-104 with the consent of the College of Arts and Science and the School of Business Administration.

\*\*Bus. Ad. GBA282, Business Policy, and ACC283, C.P.A. Problems, strongly recommended as General Electives.

\*\*\*To be admitted to the School of Business Administration, full-time students must present 4 hours of credit for Physical Education or a substitute—such as Military Science—acceptable in the Department of Physical Education.

## BACHELOR OF SCIENCE WITH A MAJOR IN INDUSTRIAL MANAGEMENT

The program in Industrial Management is designed to prepare students for successful progress toward the growing number of attractive executive positions in industry which demand not only business administrative ability but also an understanding of the physical and engineering sciences.

To achieve the required degree of understanding of both of these fields without undesirable sacrifice of study in the humanities and social sciences, the student must complete a somewhat larger number of hours of study than is prescribed for the other degree programs of the School, with a somewhat smaller number of electives. ROTC students will require five years to complete the program.

The degree requirements outlined below apply to those who began their study prior to September, 1959. Students entering the College of Arts and Sciences or the University School after September, 1959 should consult the degree requirements on page 215.

<b>I. Minimum Study in Engineering .....</b>		<b>31 hours</b>
M.E. 101-102, Engineering Drawing .....	6 hours	
M.E. 105, Shop Practice .....	1 hour	
M.E. 111, Applied Mechanics .....	3 hours	
M.E. 113, Mechanics of Materials .....	3 hours	
M.E. 211, Materials Laboratory .....	2 hours	
M.E. 250 & 251, Thermodynamics .....	6 hours	
M.E. 255, Engineering Laboratory .....	2 hours	

Ch.E. 101, Introduction to Chemical Engineering .....	2 hours	
E.E. 157 & 158, Elementary Electrical Engineering .....	6 hours	
<b>II. Minimum Study in Business Administration .....</b>		<b>30 hours</b>
GBA 157 & 158, Fundamentals of Business Administration .....	6 hours	
ACC 153, Principles of Accounting I. ....	3 hours	
ACC 209, Managerial Cost Accounting .....	3 hours	
PRD 208, Production Management .....	3 hours	
PRD 231, Work Simplification and Measurement .....	3 hours	
QNT 205, Elementary Business Statistics .....	3 hours	
GBA 251, Administrative Principles and Practices .....	3 hours	
Business Administration Electives* .....	6 hours	
<b>III. Minimum Study in Basic Science and Mathematics .....</b>		<b>30 hours</b>
Chem. 121 & 122, General Chemistry		
or Chem. 123 & 124, General Inorganic Chemistry .....	8 hours	
Math. 100, Introductory College Mathematics .....	3 hours	
Math. 101, Elementary Calculus .....	3 hours	
Math. 150 & 151, Intermediate Calculus .....	8 hours	
Physics 101-102, General Physics A		
or Physics 107-108, Physics I. ....	8 hours	
<b>IV. Minimum Study in Humanities and Social Sciences .....</b>		<b>39 hours</b>
Economics 101-102, Principles of Economics .....	6 hours	
Economics Elective .....	3 hours	
English 101-102, English Composition .....	6 hours	
English 103-104, Introduction to Literature** .....	6 hours	
Psychology 101-102, Introduction to Psychology .....	6 hours	
Humanities Elective .....	6 hours	
Social Science Elective .....	6 hours	
<b>V. Unrestricted Electives .....</b>		<b>6 hours</b>
<b>VI. Physical Education*** .....</b>		<b>6 hours</b>
<b>V. Total Minimum Required .....</b>		<b>140 hours</b>

\*Bus. Ad. FIN 205, Financial Management, and MKT 203, Marketing, strongly recommended as Business Administration Electives.

\*\*English 111-112 or other literature courses may be substituted for English 103-104 with the consent of the College of Arts and Science and the School of Business Administration.

\*\*\*To be admitted to the School of Business Administration, full-time students must present 4 hours of credit for Physical Education or a substitute—such as Military Service—acceptable in the Department of Physical Education.

## Admission Requirements

Students are admitted to the School of Business Administration at the beginning of their junior year. To qualify for unconditional admission, a student must have earned, at the University of Rochester or at some other accredited institutions, not less than 60 hours of credit, distributed as follows:

### Majors in Accounting and Business Administration

<b>I. Minimum Study in Arts and Science .....</b>		<b>37-40 hours</b>
Economic Principles .....	6 hours	
English Composition .....	6 hours	

English Literature .....	6 hours	
Laboratory Science .....	6-8 hours	
Mathematics .....	7-8 hours	
Social Science Elective .....	6 hours	
<b>II. Preprofessional Study in Business Administration .....</b>		<b>12 hours</b>
Accounting Principles .....	6 hours	
Fundamentals of Business Administration .....	6 hours	
<b>III. Electives (additional study in Arts and Science recommended) .....</b>		<b>8-11 hours</b>
Total (exclusive of any physical education required of freshmen and sophomores in the College attended, or an acceptable substitute therefore).....		<b>60 hours</b>

### Majors in Industrial Management

<b>I. Humanities and Social Science .....</b>		<b>12 hours</b>
English Composition .....	6 hours	
English Literature .....	6 hours	
<b>II. Basic Science and Mathematics .....</b>		<b>38 hours</b>
Chemistry 121 & 122 or Chemistry 123 & 124 .....	8 hours	
Physics 101-102 or Physics 107-108 .....	8 hours	
Physics 111-112 or Physics 117-118 .....	6 hours	
Mathematics 100 & 101 or Mathematics 110 & 111 .....	8 hours	
Mathematics 150 & 151 or Mathematics 160 & 161 .....	8 hours	
<b>III. Engineering .....</b>		<b>9 hours</b>
Engineering Graphics, M.E. 101 .....	3 hours	
Shop Practice, M.E. 105 .....	1 hour	
Statics and Strength of Materials, M.E. 112 .....	3 hours	
Introduction to Chemical Engineering, Ch.E. 101 .....	2 hours	
<b>IV. Business Administration .....</b>		<b>6 hours</b>
Principles of Accounting, ACC 153 .....	3 hours	
Managerial Cost Accounting, ACC 209 .....	3 hours	
Total (exclusive of any Physical Education required of freshmen and sophomores in the College attended, or an acceptable substitute therefore) .....		<b>65 hours</b>

Some deviation from the above specific distributions of courses may be permitted if it can be demonstrated that the student still will be able to meet all the distribution requirements for his Bachelor of Science degree in not over two more years of full-time study (or the equivalent in part-time study).

Normally, it will be expected that the admission requirements have been completed in a period of not over two years of full-time study in the case of students from the College of Arts and Science and transfer students from other institutions where a full-time course of study has been pursued.

The student's grades in the courses presented in fulfillment of these requirements must have been such as to give him a total of quality points of credit not less than double the hours of credit.\* In addition to this evidence of over-all academic ability, he must have demonstrated satisfactory achievement in all business administration and economics courses completed prior to admission to the School of Business Administration.

\*For purposes of this computation, quality points of credit per hour of credit are assigned as follows: A—4; B—3; C—2; D—1; E—0. Intermediate grades such as C+ are assigned corresponding intermediate values, such as 1.5, when such grades are recognized as part of the granting institution's official grading system.

## Graduate Program

The program of study leading to the degree Master of Science with a major in Business Administration is designed to increase the mature student's potentialities for effective participation and leadership in business. Depending on the extent of a student's previous study in business administration and economics, this program requires one to two years of full-time study, or the equivalent in part-time study.\*

For the student who previously has had little or no formal study of business administration and economics, the program involves two separate phases. The first, or prerequisite phase, consists of introductory and intermediate level study of the principal functional areas of business, basic administrative tools and practices, and the general economic environment in which business operates. The second, or graduate phase, is devoted to more advanced study in one area of business administration, independent research and report writing, and further integration in terms of top management policy and administrative action.

To be admitted to the second phase, i.e., to candidacy for the Master's degree, a student must have completed six semester hours of undergraduate study or equivalent coverage at the post-baccalaureate level in Accounting Principles, in Economic Principles, and in Business and Economic Statistics; and three semester hours each in Business or Corporation Finance, Marketing, Production or Industrial Management, and advanced Economics. These courses must have been completed with an average grade of at least B.

Five of the prerequisite subjects are offered in courses designed for and normally open only to college graduates. These courses, ACC 403, FIN 405, MKT 403, PRD 408, and QNT 405, offer more sophisticated and rigorous development of the subjects treated, hence provide better preparation for completion of the Master's degree requirements than do the corresponding undergraduate-level courses in these subjects. Their introduction represents a further strengthening of the program along lines characteristic of the M.B.A., or Master of Business Administration, type of graduate program. Additional and more detailed information on the M.B.A. program will be found in the Graduate Catalog. Students who have not as yet completed the prerequisite requirements in these subject fields should elect the new 400-level courses rather than the corresponding 200-level courses.

Upon admission to candidacy a student selects one field, e.g. accounting, finance, marketing, production, in which to specialize and prepare a master's essay or thesis. Typically half of his program concerns the field of specialization and includes all of the following Business Administration courses: GBA 421, GBA 483, and GBA 488, plus three to six semester hours in advanced Economics courses. In most cases Plan B for those whose basic degrees involved little or no formal study of business administration and economics is recommended. Others with substantial coverage in these fields may wish to consider Plan A. A more detailed description of the program may be obtained from the School of Business Administration. (See page 24.)

\*Typically about three years of part-time study are required to complete the number of courses taken in one year of full-time study. The normal load for part-time students is two courses (about six semester hours) per term.

# SCHOOL OF BUSINESS ADMINISTRATION

*Director of the School*

**John M. Brophy**, PH.D.

*Coordinator, Office of Instruction*

**Michael L. Dunn**, B.S.

*Evening Academic Counselor*

**Milton Cherkasky**, M.S.

## Faculty

(1959-1960)

- |   |  |
|---|--|
| <b>John M. Brophy</b> , PH.D. (Cornell)<br>Professor of Business Administration                 | <b>Alvin Birnbaum</b> , B.A. (City of New York)<br>C.P.A. (New York)<br>Assistant Lecturer |
| <b>Eric C. Vance</b> , M.A. (Columbia)<br>Professor of Business Administration                  | <b>Arthur F. Brueningsen</b> , A.B. (Lafayette)<br>Assistant Lecturer                      |
| <b>John D. Stanley</b> , D.B.A. (Indiana)<br>Associate Professor of Business Administration     | <b>Rae A. Clark</b> , LL.B. (Cornell)<br>Associate Lecturer                                |
| <b>Donald F. Istvan</b> , D.B.A. (Indiana)<br>Assistant Professor of Business Administration    | <b>Wiles E. Converse</b> , M.B.A. (Pennsylvania)<br>Assistant Lecturer                     |
| <b>George Schwartz</b> , PH.D. (Pennsylvania)<br>Assistant Professor of Business Administration | <b>Frank M. Cummings, Jr.</b> , B.S. (Syracuse)<br>Assistant Lecturer                      |
| <b>John J. Wheatley</b> , PH.D. (Buffalo)<br>Assistant Professor of Business Administration     | <b>James C. Duffus</b> , B.A. (Yale)<br>C.P.C.U.<br>Associate Lecturer                     |
| <b>John F. Bush</b> , A.B. (Rochester)<br>Senior Faculty Associate                              | <b>J. Henry Elferink</b> , A.B. (Rochester)<br>Lecturer                                    |
| <b>Sam J. Ange</b> , B.S. (Rochester)<br>C.P.A. (New York)<br>Assistant Lecturer                | <b>William Elser</b> , M.B.A. (Michigan)<br>C.P.A. (New York)<br>Assistant Lecturer        |
| <b>Minor P. Avery</b> , E.E. (Syracuse)<br>Assistant Lecturer                                   | <b>Richard L. Epstein</b> , LL.B. (Yale)<br>Associate Lecturer                             |
| <b>Jack H. Benard</b> , B.S. (Illinois)<br>Associate Lecturer                                   | <b>Lyle M. Farnen</b> , M.B.A. (Harvard)<br>Assistant Lecturer                             |
| <b>William F. Bergin</b> , B.B.A. (Niagara)<br>Assistant Lecturer                               | <b>James D. Foreman</b> , M.B.A. (Pennsylvania)<br>C.P.A. (Conn.)<br>Assistant Lecturer    |
|   | <b>William F. Freiert</b> , B.S. (Syracuse)<br>Assistant Lecturer                          |

- Joseph N. Freudenberger**, A.M. (Missouri)  
Lecturer
- Walter B. Gates**, M.B.A. (Harvard)  
Assistant Lecturer
- Harry M. Grace**, LL.B. (Pennsylvania)  
Associate Lecturer
- William H. Hallock**, A.B. (Rochester)  
Lecturer
- James T. Henderson**, A.B. (Rochester)  
Associate Lecturer
- N. Joseph Houghton**, M.B.A. (Harvard)  
Lecturer
- Albert Kasdin**, M.B.A. (Pennsylvania)  
Assistant Lecturer
- Leslie J. Knox**, M.B.A. (Syracuse)  
Lecturer
- Irwin W. Krantz**, M.A. (California)  
Assistant Lecturer
- Milton B. Lederman**, M.A. (Rutgers)  
Assistant Lecturer
- Richard C. Legge**, M.B.A. (Syracuse)  
Assistant Lecturer
- Laurance G. Locke**, B.A. (George Washington)  
Assistant Lecturer
- Harry P. Messina, Jr.**, LL.B. (Cornell)  
Associate Lecturer
- Roger H. Morley**, M.A. (Harvard)  
Assistant Lecturer
- Douglas R. Nicholson**, M.S. (Rochester)  
C.P.A. (New York)  
Lecturer
- Robert E. Nier**, LL.B. (Albany)  
Associate Lecturer
- Joseph W. O'Neill**, B.S. (Rochester)  
Assistant Lecturer
- Stephen B. Oresman**, M.B.A. (Harvard)  
Assistant Lecturer
- Richard K. Schalk**, B.S. (Iowa State)  
Lecturer
- Charles H. Schwartz**, B.A. (Niagara)  
Lecturer
- Donald J. Statt**, B.B.A. (Niagara)  
Assistant Lecturer
- Jerome J. Steiker**, M.B.A. (Harvard)  
Assistant Lecturer
- John E. Swett**, LL.B. (Harvard)  
Associate Lecturer
- Charles E. Taylor**, B.S. (Tennessee)  
Assistant Lecturer
- Gordon A. Trumbauer**, M.S. (Michigan)  
Associate Lecturer
- Lester G. Wilterdink**, M.B.A. (Harvard)  
Assistant Lecturer
- Charles P. Wolfe**, B.S. (Rochester)  
C.P.A. (New York)  
Associate Lecturer

# Courses

## OF INSTRUCTION

### EXPLANATION OF COURSE NUMBERING SYSTEM

#### Under 100 Non-credit courses.

- 100-110 Courses designed for other than degree candidates of the School of Business Administration and carrying no credit toward this School's degrees.
- 120-149 Courses designed primarily for other than degree candidates of the School of Business Administration; credit allowed toward this School's B.S. degrees only by special permission of the Director.
- 150-199 Sophomore-level courses carrying full credit toward B.S. degrees but no credit toward M.S. degrees in the School of Business Administration.
- 200-219 Junior-level courses carrying full credit toward B.S. degrees but no credit toward M.S. degrees in the School of Business Administration.
- 220-289 Junior-senior-level courses carrying full credit toward B.S. degrees and also open to graduate students in Business Administration.
- 290-299 Independent study (reading or research) courses carrying full credit toward B.S. degrees only.
- 400-419 Courses designed primarily for college graduate students; may be elected by outstanding seniors with special permission of the Director; normally do not carry credit toward the Master's degree in Business Administration.
- 420-489 Courses designed primarily for graduate students; carry credit toward the Master's degree in Business Administration.
- 490-499 Independent study (reading or research) courses open to graduate students only.

### GENERAL BUSINESS ADMINISTRATION

**GBA119. Business Organizations, Concepts and Opportunities.** (Fall) Designed for those interested but not majoring in Business Administration, this course involves a study of factors important to business and industrial growth, location, organization, technology, and community relationships. Trends in career prospects as they are affected by industrial and governmental manpower policies are given special emphasis. Visits to selected industries, case discussions and reports, and occasional evening conferences with business and industrial executives are included in the course work.

*Credit—three hours.*

**GBA157. Fundamentals of Business Administration I.** (Fall and Spring) An introduction to the principal activities, types of policy problems, and interrelationships of the main

phases of business, including procurement, production, marketing and finance. Frequent use is made of business cases, both for illustrative purposes and to introduce the student to the methods of business problem analysis.

*Credit—three hours.*

**GBA158. Fundamentals of Business Administration II.** (Fall and Spring) A study of human factors in administrative organization and executive action. Stressed throughout is management theory and process underlying effective planning, direction and control. Discussions and case reports treat issues involving cooperation or conflict among managers and non-managers, including formal and informal organization, resistance to change, communication networks, representation and participation in decision-making, and ele-

ments in "programmed" approach to improved human relations. Prerequisite: GBA 157.

*Credit—three hours.*

**GBA251. Administrative Principles and Practices.** (Fall) By means of the case method, this course deals with the administrative functions of organization, direction and control, emphasizing the human problems involved in getting things done through group effort. Topics include the role of formal and informal organization, maintenance of channels of communications, executive leadership, employee motivation, and morale. Discussion of concrete business situations serves to create a keener awareness of the attitudes, actions, conflicting values, and relationships of the individuals with whom the administrator must work, and thus to develop a workable attitude and approach to administrative problems. Prerequisites: FIN205, MKT203, and PRD208.

*Credit—three hours.*

**GBA282. Business Policy.** (Spring) This course serves to integrate the student's previous studies and further develop his ability to deal effectively with business problems. It comprises a series of cases on policy formulation and administration, involving the functions of purchasing, production, personnel marketing, finance and accounting. These cases deal with such problems as promotion, expansion, reorganization, and adjustment to changing economic conditions and social forces. During the term, business executives are invited to present and discuss cases developed from their own experience. Prerequisites: FIN205, MKT203, PRD208, and QNT205.

*Credit—three hours.*

**GBA421. Research and Report Writing.** (Fall) Review of basic principles of composition particularly as applied to present-day industrial communications. Preparation for required Master's report. Study of trends in business ideas-communication.

*Credit—three hours.*

**GBA483. Administrative Behavior and Practice.** (Fall) An analysis of human behavior in business and industrial organizations. Emphasis is given to theory of organization, and decision-making emerging from research in the social sciences. Case studies focus on mechanisms used in functioning organizations to influence and develop decisions, and to assure uniformity in interpretation, consistency in application, and compatibility with organization goals. Presentation of a

report reflecting advanced independent study will be required.

*Credit—three hours.*

**GBA488. Business Policy Seminar.** (Spring)

An integrating course requiring the application of knowledge and theory to complex business situations, and added development of conceptual technical, and administrative skill. Extensive use of case studies, supplemented by oral and written reports as well as independent advanced study will emphasize problem-identification and decision-making in a wide range of substantive areas internal and external to the firm.

*Credit—three hours.*

**GBA493. Reading Course.**

Independent study in some specific area of Business Administration, at a level advanced beyond that of regular course offerings. Prerequisite: written approval by both the supervising faculty member and the Director of the School of Business Administration.

*Credit to be arranged.*

**GBA498. Master's Essay.**

*Credit—three hours.*

**GBA499. Master's Thesis.**

*Credit to be arranged.*

## ACCOUNTING

**ACC63. Public Accounting Internship.** By special arrangements between the University and various public accounting firms, local and national, an internship program has been established which enables the students to work full time with the firms for a period of three to six weeks during their senior year. The students are given an opportunity to perform the general tasks of a junior under the supervision of a senior accountant. The students must be recommended by the instructor and duly accepted by the public accounting firm before any final arrangements can be made for their participation in the program.

Three to six weeks a semester.

*No credit.*

**ACCI53. Principles of Accounting I.** (Fall and Spring) An introduction to the principles and procedures employed in analyzing business transactions, recording their financial effects, summarizing them in financial statements, and interpreting these statements.

*Credit—three hours.*

- ACC154. Principles of Accounting II.** (Fall and Spring) A continuation of ACC153. Major emphasis is placed upon asset and equity accounting, manufacturing accounting, the development of accounting principles, and the analysis of financial statements. Prerequisite: ACC153.  
*Credit—three hours.*
- ACC209. Managerial Cost Accounting.** (Spring) A consideration of the basic elements of 1) general accounting for administration, marketing, and production costs, 2) unit cost accounting for the manufacturing firm, 3) budgeting and budgetary control and 4) standard cost accounting. Considerable emphasis will be given to both job and process cost accounting, including the principles of burden application. The discussion of budgeting and standard cost will be mainly from the standpoint of control. Prerequisite: ACC153.  
*Credit—three hours.*
- ACC221. Cost Accounting I.** (Fall) The application of cost principles and procedures to job order and process accounting; materials control and inventory methods; accounting for labor; allocation of overhead costs; cost statements. Prerequisite: ACC154.  
*Credit—three hours.*
- ACC222. Cost Accounting II.** (Spring) A continuation of ACC221. Standard cost procedures; distribution cost analysis; the use of cost information for administrative purposes. Prerequisite: ACC221.  
*Credit—three hours.*
- ACC233. Intermediate Accounting.** (Fall) An analysis of the accounting theory underlying the preparation of financial statements. Topics treated include the form and content of corporation financial statements; principles of asset valuation, accounting for capital stock and surplus and problems of income determination. Prerequisite: ACC154.  
*Credit—three hours.*
- ACC236. Advanced Accounting I.** (Spring) Topics treated include intangible assets; liabilities; reserves; analysis of financial statements; reorganizations; price-level problems; partnerships; consignments; installment sales; and insurance. Prerequisite: ACC233.  
*Credit—three hours.*
- ACC239. Advanced Accounting II.** (Fall) Topics treated include accounting for businesses in financial difficulty; estates; consolidated statements; mergers; and foreign exchange. Prerequisite: ACC236.  
*Credit—three hours.*
- ACC241. Budgetary Control.** (Fall) Principles and procedures of preparing business budgets for planning and control purposes. Preparation of sales, distribution, administration and problems involved. Extensive use of problems and cases. Prerequisite: ACC222 or the equivalent.  
*Credit—three hours.*
- ACC243. Governmental and Institutional Accounting.** A study of fund accounting as applied to governments and non-profit institutions; principles and methods of budgeting, estimating income, and operating budgetary control systems; accounting for revenue and expenditures; preparation of financial statements; and other special problems. Prerequisite: ACC233.  
*Credit—two hours.*  
Not offered 1960-61.
- ACC261. Auditing I.** (Fall and Spring) While emphasis is placed upon the work of the professional accountant, due consideration is given internal auditing procedure. Includes: purpose of audits, types of audits, methods of auditing procedure, the auditor's report and the legal and professional responsibility of the auditor. Principles and procedures are illustrated and developed by means of auditing practice cases. Prerequisite: ACC236.  
*Credit—three hours.*
- ACC262. Auditing II.** (Spring) A continuation of ACC261.  
*Credit—three hours.*
- ACC275. Income Tax Accounting I.** (Fall) After brief attention to the development of the income tax law since 1913, a careful study of the present Federal Income Tax law is made, supplemented by numerous problems in income tax accounting. Prerequisite: ACC236.  
*Credit—three hours.*
- ACC276. Income Tax Accounting II.** (Spring) A continuation of ACC275 with special emphasis placed upon the preparation of returns.  
*Credit—three hours.*
- ACC281. Accounting Systems.** (Fall) An advanced course in the design and installation of accounting systems. Procedures used in systems work are illustrated including surveys of accounting procedures, account classifications, internal controls, and use of mechan-

cal equipment. Prerequisites: one year of cost accounting and one year of auditing, or the consent of the instructor.

*Credit—three hours.*

**ACC283. C.P.A. Problems.** (Spring) Advanced accounting problems are used as a basis for the review and application of accounting concepts and procedures. The materials for the course is drawn to a great extent from actual C.P.A. Examination questions and includes analysis and revision of financial statements, partnerships, receiver's statements, consolidated statements, cost accounting, and other accounting problems. Prerequisites: ACC221, ACC239, and ACC261.

*Credit—three hours.*

**ACC403. Accounting Concepts.** (Fall) Designed for college graduates without previous formal study in accounting, this course is a broad survey of accounting with emphasis upon the development of a logical framework of underlying concepts and standards upon which accounting practices and procedures are based. The course stresses the principles and notes the procedures employed in analyzing business transactions, recording their financial effects, summarizing them in financial statements, and interpreting these statements.

*Credit—three hours.*

## FINANCE

**FIN118. Credit and Collection Principles.**

(Spring) A basic course providing a working knowledge of credits and collections. It includes a study of the nature and function of credit; types and classifications of credit; retail and mercantile credit contrasted; credit department organization; functions and personnel; credit risk factors; sources of credit information and analysis of credit risks; credit interchange services and uses; interpretation of credit reports; uses of financial statements; and collection procedures.

*Credit—two hours.*

**FIN119. Advanced Credits.** (Fall) A continuation of the course Credit and Collection Principles with emphasis upon analysis of financial statements as a source of credit information; legal remedies used in collection of delinquent accounts; handling insolvent accounts and bankruptcies; adjustment problems and the use of adjustment

bureaus; credit insurance; activities and services of credit associations; measures of credit department efficiency, and other important phases of credit work. Prerequisite: FIN118.

*Credit—two hours.*

**FIN128. Credit Management Problems.**

(Spring) This course is designed to provide the student with a working knowledge of credit management and control. A series of cases and problems are used in the course related to the analysis of an account with special consideration given to the nature of the business; current economics; industrial and governmental trends and conditions; credit limits; assignments; adjustments; bankruptcies. Prerequisite: FIN119.

*Credit—two hours.*

**FIN131. General Insurance I.**<sup>1</sup> (Fall) The historical development and economic significance of the industry as well as the types and organization of insurance carriers and the principles of rate making. Thorough discussion of the workings and basic revisions of the general insurance contract with extended study of fire and marine. Useful to the general business or economic student and prerequisite to FIN134.

*Credit—three hours.*

**FIN134. General Insurance II.**<sup>2</sup> (Spring) A

continuation of FIN131 studying all of the common casualty insurance contracts, with extended study of public liability, automobile, workmen's compensation, bonds, accident and health, aviation and "package" policies. Thorough discussion of the contract, rates, loss adjustment, insurance law and regulation of the industry. Designed for the general business or economic student as well as for those interested in insurance as a career. Prerequisite: FIN131.

*Credit—three hours.*

**FIN205. Financial Management.** (Fall) A

study of the financial policies and practices essential to effective business administration with major emphasis on corporation finance. Topics treated include corporation securities, promotion, long-term financing, short-term financing, administration of funds, administration of income, expansion, and reorganization. Emphasized throughout is the

<sup>1</sup>FIN131 and FIN134 prepare the student for the A.B.C. examinations given by the Insurance Institute of America and for examinations for agent's and broker's licenses under Sections 115 and 119 of the New York State Insurance Law.

adaptation of financial principles to specific business situations. Prerequisites: GBA157 and ACC154.

*Credit—three hours.*

**FIN246. *Investment Management.* (Fall)** The general principles of successful investment, as applied to the management of individual and institutional investors' funds. Topics studied include determining investment objectives, formulating general investment policies, classifying investment media, interpreting and forecasting general market trends, analyzing leading industries, and the developing criteria for the selection of individual security issues. Prerequisites: ECO101 and GBA158.

*Credit—three hours.*

**FIN256. *Financial Analysis.* (Spring)** The analysis of corporation and other financial reports, from the standpoints of investors, short-term creditors, and management. Primary emphasis is placed on the interpretation of balance sheets, income statements and other company and industry data for the purpose of analyzing investment bonds, investment and speculative stocks, and short-term credit risks. Prerequisites: FIN205 and ACC233.

*Credit—three hours.*

**FIN405. *Financial Management.* (Spring)** This course, designed for college graduates with no previous formal training in corporation finance, analyzes the policies and practices required for effectively planning and controlling the finances of corporations and other businesses. Topics include corporation securities, promotion, long-term financing, short-term financing, administration of funds, administration of income, expansion and reorganization. Emphasized throughout is the adaptation of financial principles to specific business situations. Prerequisites: ACC154 or ACC403, and at least one course in Marketing, Production Management or Fundamentals of Business Administration.

*Credit—three hours.*

## INDUSTRIAL & HUMAN RELATIONS

**IHR140. *Personnel Relations.* (Spring)** Primarily for non-majors in Business Administration, this course centers upon an analysis of relationships, procedures, and techniques employed in mobilizing human resources. Topics include employee selection, develop-

ment compensation; employee participation in decision making and the issues involved in extending employee benefit and service programs. Consideration will also be given to labor mobility. A limited number of field studies will be made.

*Credit—three hours.*

**IHR231. *Business and Corporate Public Relations.*** Principles and history of public relations as a key function of business management. Requirements for an executive and/or practitioner. Fundamentals of planning and programming, with analysis of typical blueprints for action. Demonstration and practice in publicity techniques for effectively communicating a company's story, through setting up a hypothetical corporation, emphasis on class participation in solving major public relation problems of business and industry.

*Credit—three hours.*

Not offered 1960-61.

**IHR241. *Fundamentals of Personnel Administration.* (Fall)** A study of organized approaches to employing, developing, compensating and servicing a workforce so as to assure optimum return to the employing organization, the cooperative effort of individuals and groups involved, and maximum satisfaction consistent with the need for coordination and control. Personnel Administration as a staff function is given special attention together with research bearing on the validity of personnel concepts, requirements, and practices. Emphasis is on administrative considerations rather than application of refined technique. Prerequisite: GBA158.

*Credit—three hours.*

**IHR244. *Human Relations in Industry.* (Spring)** A study of the factors related to establishing effective human relationships in industrial and business organizations. Topics to be included are employee motivation, employee morale, developing effective channels of communication, and factors related to leadership and supervisory skills. The course is designed to augment IHR241—Fundamentals of Personnel Administration. Prerequisite: GBA158.

*Credit—three hours.*

**IHR262. *Management-Union Relationships and Public Control.* (Spring)** A study of the relationships between management, unions and government at the plant and industry level as they influence managerial decision making. Topics include a comparative analysis of union-company philosophies, structures, and functions; issues and conditions

leading to cooperation and conflict; sources of power; alternatives to force; the character and effect of agreements and settlements; administration of agreements; and conditions influencing governmental participation and control. Prerequisites: ECO102 and GBA158 or consent of instructor.

*Credit—three hours.*

## BUSINESS LAW

**LAW203. Business Contracts I. (Fall)** Basic principles of contract law, including the doctrines of offer and acceptance, consideration, effect of mistakes, fraud and undue influence, the necessity of a writing, and rights of enforcement where there has been failure of performance. Case material from factual situations faced in everyday business, with special reference to laws of New York State. Prerequisite to all other business law courses.

*Credit—two hours.*

**LAW204. Business Contracts II. (Spring)** A continuation of LAW203.

*Credit—two hours.*

**LAW223. Law of Sales and Negotiable Instruments. (Fall)** Law of sales under the Uniform Sales Act and the law of negotiable instruments, including promissory notes, drafts, bills of exchange, warehouse and trust receipts.

*Credit—two hours.*

**LAW226. Agency, Partnerships, and Corporations. (Spring)** Legal aspects of agencies, partnerships, and corporations as a means of carrying on business. Creation and incidents of the agency relationship; rights of partners as between themselves and third parties; formation and powers of corporations; rights of stockholders; and problems arising from business liquidation.

*Credit—two hours.*

**LAW235. Fundamentals of Patents. (Spring)** Tests for invention, mechanics of protecting inventions, rights of inventors and employers, patent licensing, infringement, validity, patentability and inventorship discussed from the standpoint of business and technical personnel.

*Credit—two hours.*

## MARKETING

**MKT203. Marketing. (Fall and Spring)** A study of the problems involved in the movement of goods from producers to consumers and industrial users through the different channels of distribution. An analysis of the marketing functions performed by manufacturers, wholesalers, retailers, agent middlemen, and market exchanges. Through the use of the case method, major marketing policies are critically analyzed and evaluated including such topics as pricing, branding, choice of distribution channels, selective selling, and the planning and administration of sales programs. Prerequisite: GBA158.

*Credit—three hours.*

**MKT221. Advertising. (Fall)** The objective of this course is to develop an understanding of and ability to appraise advertising as a part of the selling program. After surveying the social and economic aspects of advertising, a critical examination is made of the principles and techniques involved in developing good copy, making layouts, and reproducing the advertisement. The case method is used to illustrate and analyze the chief advertising problems faced by businessmen. Topics treated include stimulating primary and selective demand, determining basic promotional strategy, formulating and executing promotional programs, selecting advertising media, determining the appropriation, testing the advertising and maximizing the results. Prerequisite: MKT203.

*Credit—three hours.*

**MKT234. Principles of Retailing.** The objective of this course is to develop the principles of management as applied to retail stores. The techniques of retail merchandising are examined and cases are used to provide the student with training in making decisions. Topics discussed include store location, layout and organization, analysis of consumer demand, buying, pricing, merchandise control, budgetary control, retail salesmanship, retail advertising and display, sales promotion planning, credits and collections, store personnel work, and general retail management. Prerequisite: MKT203.

*Credit—three hours.*

Not offered 1960-61.

**MKT241. Marketing Research and Analysis. (Spring)** An investigation and critical examination of facts as a basis for formulating marketing policies and planning sales and promotional strategy. A problem of current

interest may be selected for investigation as a class project. Intensive analysis of the topics chosen provides practical experience in the identification of the specific research problem, the types and uses of research techniques, sampling methods, construction of questionnaires, tabulation and analysis of results, preparation of reports, and interpretation of conclusions as a basis for executive action. Prerequisite: MKT203 or permission of the instructor.

*Credit—three hours.*

**MKT244. Sales Management.** (Spring) Comprehensive cases and problems are utilized to develop the management principles involved in product merchandising, selecting wholesale and retail outlets, determining prices and terms of sale, utilizing marketing research in the solution of sales problems, planning sales programs and sales promotion, building a sales organization, managing the sales force, and controlling sales costs. Prerequisite: MKT203.

*Credit—three hours.*

**MKT271. Industrial Procurement.** (Fall) The development of a fundamental purchasing policy, with emphasis upon methods of determining the proper sources of supply, the proper quantity to buy, and the proper price to pay. Modern inventory control methods, departmental organization, and the preparation of reports to management. Selected case problems will also be utilized, which will deal with specific situations requiring decisions and recommended courses of action.

*Credit—three hours.*

**MKT403. Managerial Marketing.** (Fall) Designed for college graduates without previous formal study in Marketing Management, this course analyzes the theory and practice in planning, organizing and controlling marketing activities from the marketing executive's viewpoint. Topics covered include integration of major tasks and decisions involved in developing and marketing products, marketing planning, selection of channels of distribution, study of the market structure and forces within the business firm which influence the competitive character of marketing effort, legal restrictions affecting distribution, and theoretical aspects of marketing. Special reports and case materials are emphasized.

*Credit—three hours.*

## PRODUCTION

**PRD208. Production Management.** (Fall and Spring) A study of the issues, concepts and practices encountered in effectively managing the production function. Topics covered include analysis of facilities; research and product development; production planning; organizing and controlling characteristics of the manufacturing processes; control of quality, quantity and cost; consideration of increased automation; and nature and applications of operations research. Case analysis is emphasized, and field studies of industrial plants may be included. Prerequisites: GBA158 and ACC153.

*Credit—three hours.*

**PRD223. Establishment and Analysis of the Production Facility.** (Fall) Integration of characteristics and requirements of process, product, and operation into a total production system. Topics include plant location material flow patterns; physical arrangement of direct and auxiliary facilities; utilities and services; characteristics and selection of material handling devices; economic evaluation of alternatives for capital expenditures including MAPI formula and discounted cash flow techniques; and the development of tooling and manufacturing policies.

*Credit—three hours.*

**PRD226. Production Operation and Control.** (Fall) Material planning, procurement, and the establishment of plant and out-plant production policies; scheduling, shop-loading and deriving needed statistical data for quality control; production planning and control; parts accountability, warehousing, storage, and shipping; fabrication and assembly operations; production analysis charts, job and machine load forecasts, and labor forecasts.

*Credit—three hours.*

**PRD231. Work Simplification and Measurement.** (Spring) Elements in obtaining optimum utilization of plant with minimum labor and material costs. Topics include analysis of production systems into unit operations; principles and applications of motion and time study, including process and operation analysis, MTM, standard data and synthetic times; analysis of performance and productivity trends; job description and classification as a factor in establishing wage and salary systems; and analysis of wage rates and productivity in management planning and control.

*Credit—three hours.*

**PRD234. Problems in Production Management.** Through specific cases and supporting investigations, consideration is given to issues and problems in production management at the corporation level. Topics include manufacturing policy development, short and long-run objectives, plans and programs; development and establishment of production schedules; selection and utilization of plant and equipment, material and supplies; control and reduction of costs; inventories; warehousing; research projects; interrelationships with financial, personnel, safety, legal, tax, technical, and other control programs; and the coordination and collaboration needed in carrying out executive responsibilities. Prerequisite: PRD208 or both PRD223 and PRD226.

*Credit—three hours.*  
Not offered 1960-61.

**PRD408. Production Management. (Fall)** Theory and practice in planning, organizing, directing and controlling production activities are considered from the production executive's viewpoint. Topics covered include analysis of facilities; research and product development; planning, organizing and controlling characteristics of the production processes; control of quality, quantity and cost; consideration of increased automation; and nature and application of operations research. Special reports and case materials are emphasized. Admission restricted to graduate students who have not completed PRD208 or its equivalent.

*Credit—three hours.*



## QUANTITATIVE METHODS

**QNT205. Elementary Business Statistics. (Fall and Spring)** Methods of statistical analysis common to all fields, including collection and charting of data, computation and use of averages and measures of dispersion, sampling, and statistical investigation. Prerequisite: Intermediate Algebra.

*Credit—three hours.*

**QNT206. Intermediate Business Statistics. (Spring)** Techniques of statistical analysis applicable to business and economic data, including construction and use of index numbers, time series analysis, correlation, and forecasting. Prerequisite: QNT205.

*Credit—three hours.*

**QNT231. Electronic Data Processing. (Fall)** A first course in the preparation of data and the use of electronic machines to provide information needed for executive decision. The course will include an introduction to the nature, programming and use of equipment with emphasis on that available at the University of Rochester Computing Center. Typical case studies concerned with current uses in business and government will be investigated with the equipment at the Computing Center.

*Credit—three hours.*

**QNT234. Data Processing Systems. (Spring)** Analysis of the overall design of business systems for electronic data processing. Study of how a complete system relates to the equipment to be used. The last part of the course is devoted to the analysis, charting and solution of a realistic business system and individual assignments in the field of electronic data processing for business. Prerequisite: QNT231.

*Credit—three hours.*

**QNT405. Business Statistics. (Spring)** A condensation of QNT205 and QNT206, intended for college graduates only. The course surveys the basic principles and procedures of statistical analysis essential to the administrator concerned with business policy formation and control. Principal topics include collection, summarization and presentation of statistical data; time series analysis, construction of index numbers; correlation; and statistical inference.

*Credit—three hours.*

## REAL ESTATE

**R-E121. *Fundamentals of Real Estate.*** Introductory study of technical, legal and economic phases of real estate business. Topics covered include ownership, contracts, deeds, bonds and mortgages, leases, title insurance and title closing, appraisal, depreciation, financing, investment, management, planning, rent control, housing, and the growing role of government.

*Credit—three hours.*  
Not offered 1960-61.

**R-E123. *Real Estate Brokerage Law and Practice.*** A study of real property law, including real estate contracts, liens and easements, leases, bonds and mortgages, deeds, agency, and forms of voluntary and involuntary alienation.

*Credit—three hours.*  
Not offered 1960-61.

**R-E125. *Property Management and Financing.*** (Fall) A study of property analysis, location, space layout, equipment service, rental policies, vacancy and rental surveys, lease provisions, budgets, accounting, inspection, purchasing, maintenance, building codes, tenant relations, and operating policies. Attention is also given to equities and mortgages, leases, junior liens, mortgage origination, servicing, defaults, and the impact of legislation on financing of real estate investments.

*Credit—three hours.*

**R-E127. *Real Estate Appraisal and Valuation.*** (Spring) A study of the relationship between the urban economy, land values, and land utilization, including the economic characteristics of realty, the market for realty, real estate cycles, and the changing pattern of urban land use. Residential, business, and industrial uses are also considered, with special reference to population and land value studies, architecture and construction, condemnation and eminent domain, growth and re-development. Emphasis is on developing ability to select value evidences and to calculate and apply legal principles as well as administrative standards.

*Credit—three hours.*

## TRANSPORTATION

**TRP227. *Principles of Transportation Management.*** A course of study which deals with the economic aspects of the transportation system in the United States from the era of railroad building to the present day. It provides an overall look at the transportation system, indicating the relative importance of the various modes of transport, stressing their similarities and their significant differences. The rate structure, special aspects of administration and organization, and selected carrier problems are examined from the standpoint of theory and practice. Special consideration is given to national transportation policy.

*Credit—three hours.*  
Not offered 1960-61.

**TRP232. *ICC Law and Regulations.*** (Fall) A course designed to provide students with an understanding of the Interstate Commerce Act, particularly the features which provide for the regulation of the several modes of transportation. The case method of study is employed, requiring the student to read decisions of the courts and the commission. Issues arising under the Act include cases affecting common, contract and private carriers and distinctions between the nature of interstate and intrastate transportation. Prerequisite: TRP227.

*Credit—three hours.*

**TRP257. *Transportation Management.*** (Spring) Problems of transportation, forming an extension of materials introduced in TRP227 and TRP232. This course is designed to be an integrating course in the field of transportation. Important factual material is covered but emphasis is on the decision-making and management skills developed by use of the case method. Prerequisite: TRP232.

*Credit—three hours.*



## *Department of Nursing*

### SCHOOL OF MEDICINE & DENTISTRY

**T**HE UNIVERSITY OF ROCHESTER offers to undergraduate students a program leading to the degree, Bachelor of Science with a Major in Nursing. The entire four and one half year program is designed to include a broad liberal foundation and sound professional preparation for the practice of nursing in hospitals and public health nursing agencies.

Students are admitted to the Department of Nursing of the School of Medicine and Dentistry at the beginning of the junior year.

## *Admission to the Department of Nursing*

Students who plan to major in nursing should file application for admission to the Department of Nursing during the last semester of the sophomore year. Requirements for admission include:

- a. completion at the University of Rochester, or at another approved institution, of a minimum of 60 semester hours of selected course work distributed as follows:

Group I —Literature and Other Arts, including adequate work in English Composition (usually 6 hours).....	18
Group II —Social Sciences including Sociology 6 hours.....	12
Group III—Biological and Physical Sciences including: General Biology and IV (laboratory course) 6 hours	
Inorganic and Organic Chemistry (laboratory course) 6 hours	
Intro. to Psychology 6 hours.....	18
Electives chosen from the areas of literature and other arts, social sciences, physics and mathematics .....	12
	60

Courses NOT accepted as fulfilling admission requirements include vocational courses and courses offered in the professional program in the Department of Nursing. Credit for physical education required in the college attended is not included in the 60 semester hour admission requirement.

- b. a 2-0 honor point average (Grade of C) based upon all course work taken prior to admission.  
 c. a satisfactory health record.  
 d. a strong desire to make nursing a career and evidence of suitable aptitude for service to people.  
 e. acceptance by the Committee on Admissions of the Department of Nursing.

### PROGRAM LEADING TO THE DEGREE BACHELOR OF SCIENCE WITH A MAJOR IN NURSING

#### Freshman Year

		HOURS	
		<i>1st Term</i>	<i>2nd Term</i>
Engl. 101-102	English Composition	3	3
Soc. 101-102	Introduction to Anthropology and Sociology	3	3
Chem. 111-112	Elementary Chemistry and Elementary Organic Chemistry	4	4
Elective	Group I	3	3
Elective	Group II	3	3
Phys. Ed.	Physical Education	1	1
		17	17

#### Sophomore Year

Biol. 101-102	General Biology	4	4
Psych. 101-102	Introduction to Psychology	3	3
Elective	Group I	3	3
Elective	Group II	3	3
Elective	Free	3	3
Phys. Ed.	Physical Education	1	1
		17	17

Professional Major in Department of Nursing  
School of Medicine and Dentistry

Third Year

		Fall	Spring and Summer
Biol. 117	Microbiology	3	
Nu. 200	Introduction to Nursing	5	
Nu. 210	Nutrition	3	
Nu. 212	Human Anatomy and Physiology	6	
Nu. 214	Pharmacology		3
Nu. 216	Historical Development of Nursing		2
Nu. 218	Medical and Surgical Nursing I		12
Nu. 219	Field Work in Medical and Surgical Nursing I		6
		—	—
		17	23

Fourth Year

Nu. 222	Pediatric Nursing	5	
Nu. 223	Field Work in Pediatric Nursing	2	
Nu. 224	Obstetric Nursing	5	
Nu. 225	Field Work in Obstetric Nursing	2	
Nu. 226	Psychiatric Nursing		5
Nu. 227	Field Work in Psychiatric Nursing		2
Nu. 228	Medical and Surgical Nursing II		3
Nu. 229	Field Work in Medical and Surgical Nursing II		2
		—	—
		14	12

Fifth Year

Nu. 230	Public Health	2	
Nu. 232	Public Health Nursing	2	
Nu. 233	Field Work in Public Health Nursing	2	
Nu. 236	Nursing Management in the Hospital Division	2	
Nu. 240	Senior Seminar in Nursing	2	
		—	—
		10	

*Tuition and Fees*

	3rd Year	4th Year	5th Year
Application Fee (if transferring from another institution)	\$ 10.00		
Tuition	500.00	\$500.00	\$250.00
Student Activity Fee	25.00	5.00	
Health Fee	25.00	25.00	15.00
Hospital Insurance Premium	41.76	41.76	41.76
Uniforms, books, field trips*	125.00	50.00	25.00

\*Estimate.

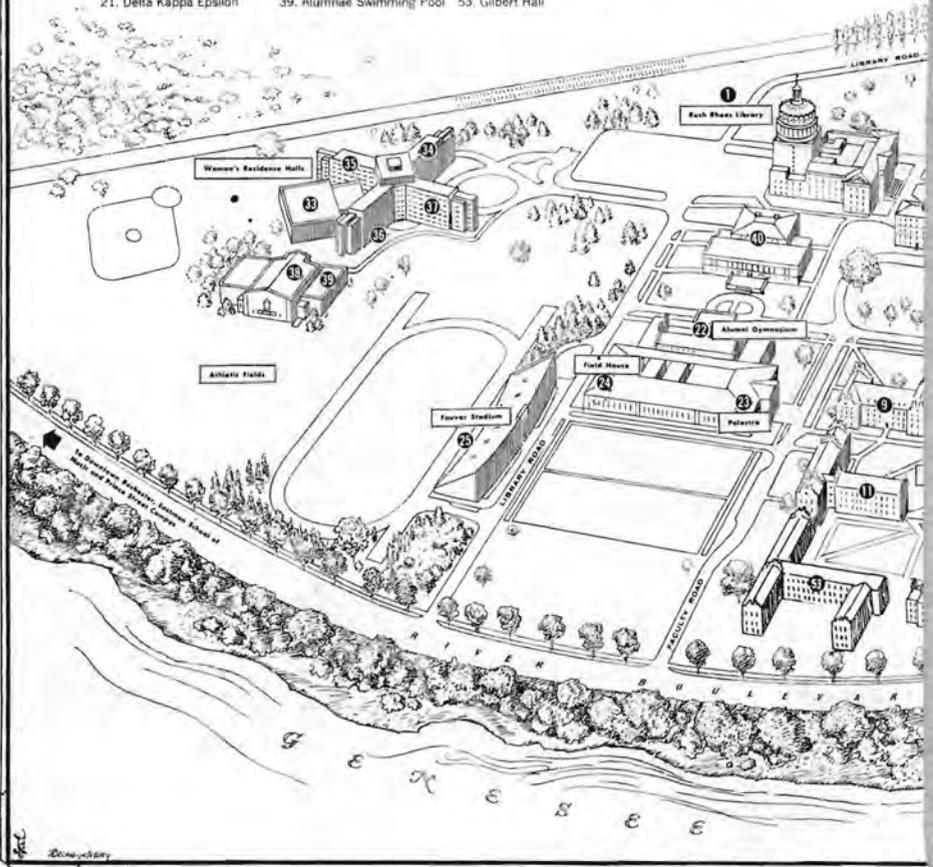
Tuition and Fees subject to change without notice.

No charge is made at present for room, board or laundry. Students live in Helen Wood Hall, women's residence at the Medical Center. The Bulletin of the Department of Nursing contains complete information about the program in nursing. A copy of the current bulletin and application materials may be obtained by writing to:

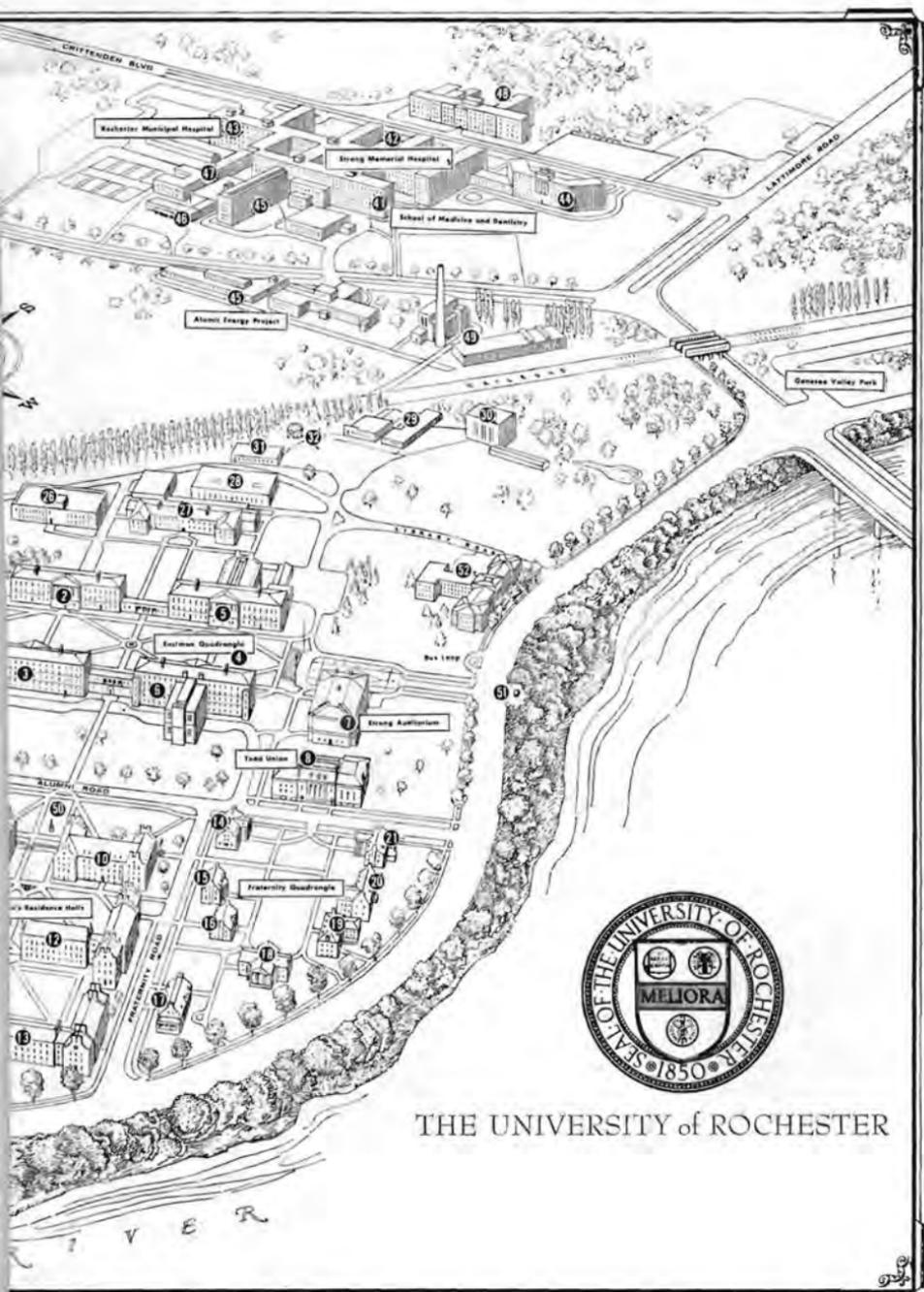
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School of Medicine and Dentistry  
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- |  |   |   |
|--|---|---|
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| 4. Eastman Quadrangle and Eastman Centennial | 25. Fauver Stadium                                    | 43. Rochester Municipal Hospital                |
| 5. Dewey Hall                                | 26. Harkness Hall (ROTC)                              | 44. Wing "R" Psychiatric Clinic                 |
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| 9. Crosby Hall                               | 30. Cyclotron (240,000,000 volt)                      | 48. Helen Wood Hall—School of Nursing Dormitory |
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| 15. Kappa Nu                                 | 36. Gannett Hall                                      |   |
| 16. Sigma Chi                                | 37. Anthony Hall                                      |   |
| 17. Theta Delta Chi                          | 38. Women's Gymnasium                                 |   |
| 18. Psi Upsilon                              | 39. Alumnae Swimming Pool                             |   |
| 19. Theta Chi                                |   |   |
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Art. *Donnelly*



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