Official Bulletin of the University of Rochester / 1968-69
Course Definition

The ordinary unit of undergraduate instruction is the course. Each course requires one quarter of the student's working time for one term. Courses numbered between 100 and 298, unless otherwise stated, carry the equivalent of four hours of credit.

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.
290-298  |  Undergraduate reading or research courses.
299  |  Courses designating study abroad.
300-399  |  Honors courses—carrying equivalent of eight hours credit unless otherwise specified.
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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The University opened its doors in 1850. There are no voluminous records of ceremony or promise. But one noted American of the time, Ralph Waldo Emerson, wrote the following about this event:

"... a landlord in Rochester had an old hotel which he thought would rent for more as a university; so he put a few books, sent for a coach-load of professors, bought some philosophical apparatus, and by the time green peas were ripe had graduated a large class of students."

The University was founded as a small liberal arts college for men. From the very beginning it has been dedicated to educating intelligent young people to accept the challenge of improving the complex environment in which they live.

For over four generations, the University has pursued as its goal a place among the major institutes of learning. Its motto reflects its continuing efforts to improve—Meliora! Today, the University is a distinguished and diverse co-educational institution of broad scope and increasing influence. It rates as a leader among the country's medium-sized, private universities.

Expansion has always been carefully planned and controlled. Size has not been equated with quality. Growth has been directed toward evolving a better University, not a larger one or one that is broadest in the disciplines taught.
As a matter of history, the word meliora was written into the records as the official motto of the University in May of 1851. The seal adopted at that time had a device of a hand pointing forward and upward. The present seal is different in appearance, but the motto is unchanged.

A student can expect innovation as well as inspiration from Rochester. To this end, undergraduate education at the University of Rochester is integrated with graduate education; and to the extent that their capacity and ability prescribe, undergraduates may work at the graduate level. As President W. Allen Wallis explains, “Our objective is not just to see that our undergraduates can pass some set of examinations but to see that each student makes the greatest advance of which he is capable in four years ...”.

Since today’s student lives in a world of rapid change, the University is constantly adapting its program to meet student needs.

At the freshman level, the University has pioneered in a Preceptorial Program, which introduces selected first-year students to significant and demanding intellectual pursuits. The students engage in intensive readings, seminars, and critiques, all under the guidance of a senior faculty member. Since the program was started in 1962, the number of courses has grown from three to twenty-one, with more still to be included.

The University has the second oldest Honors Program in the country. In this program small groups of students meet regularly for informal seminars. They commit themselves to a demanding regimen of independent reading and study and are exposed to criticism by both their peers and key members of the faculty. The Honors students enjoy latitude in their studies and an opportunity to develop a creative approach in their chosen fields. For this privilege they assume considerable responsibility, a factor which is as important to their growth as the subject matter.

The University of Rochester offers interdisciplinary programs in Canadian studies, Russian studies, East Asian studies, South Asian studies, general science, biomedical engineering, brain research, space science, and the visual sciences.

The curriculum provides the student not only with broad choice, but also with depth. He may range from Astronomy to Astro-Physics, from Primitive Art to Modern Energy Conversion, from Sanskrit to Conversational Chinese.

Among these special programs are the following:

- The nation’s first college-credit course in programmed instruction.
- A teaching internship that is unique and has been cited as one of the ten outstanding teacher-preparation programs in the country.
- The South Asian Language and Area Center, one of fourteen such institutes supported by the government for the study of languages and cultures of India, Pakistan, and Ceylon.
An East Asian Language and Area Center in which undergraduates who are interested in the area of China and Japan have the opportunity to study the language and related fields of a major civilization while concentrating in a traditional discipline.

The Center for Brain Research, jointly sponsored by the College of Arts and Science, the College of Engineering and Applied Science, and the School of Medicine and Dentistry; concerned primarily with graduate level research on problems of the nervous system; offering research or reading courses to undergraduate students with special permission.

A Faculty of Distinction

The keystone of any university must, of necessity, be the faculty, because both in fact and philosophy, "a teacher affects eternity."

To teach, then, is the first calling of Rochester's 800 full-time and nearly 900 part-time faculty members. The number of faculty whose performance in teaching commands the respect of the entire academic community is, indeed, very high.

Teaching, however, is only one responsibility of a great faculty. Research, synthesis, codification, and creative activities are also vital to the continuing growth of a major university.

Faculty members have earned high honors and gained fame and recognition in the arts and sciences. They have won coveted awards such as the Nobel Prize for Medicine, the Pulitzer Prize, and Prix de Rome in Music.

In 1964, the University was selected as a recipient of a New York State Albert Einstein Chair in Science. In endowing this chair, the charge read in part as follows: "...as a logical extension of existing programs and commitments of an institution that has already achieved national eminence."

Distinguished alumni

The ultimate test of a university's quality is the caliber of its graduates. The University is proud of all of its alumni, for they have attained distinction in a wide variety of pursuits.

The University of Rochester has ranked high among the private universities in the nation in producing scholars who have achieved the Doctor of Philosophy Degree.

Only two medical schools have contributed a higher proportion of their graduates to medical faculty positions. Fourteen graduate fellows in dentistry have become deans of dental schools.

And among the many talented Eastman School of Music graduates, nine are now deans or directors of music schools.

Countless alumni serve with distinction and honor in law, government, industry, finance, communications, and the military service of their country. In philanthropic as well as cultural activities graduates of the University contribute generously in time, talent, and support.
An evolving student body

The academic standards of this University are reflected both in its entrance requirements and in the performance of its undergraduates. Take the class of 1970 for example. It is fairly typical of a trend. Six out of ten were in the top tenth of their high-school graduating classes. Eight out of ten were in the top fifth.

The average entrant placed among the top five per cent of all freshmen entering college in 1966.

During their stay in Rochester, four out of every 10 undergraduates qualify for the Dean’s list. This requires an average of Grade B or better in all courses taken for credit.

Three out of four male undergraduates, and four out of ten women pursue advanced studies.

When what had been a golf course in 1930 was transformed into the River Campus to house the Men’s College the total enrollment of the then co-ordinate colleges was 700. That was fewer students than this year’s graduating class.

The full-time enrollment now numbers fifty-three hundred. Two thirds of these students are undergraduates. An additional three thousand persons are registered for part-time studies.

In 1920, seventy-two per cent of the freshman class came from the Monroe County area; today eleven per cent come from Monroe County. The University of Rochester has emerged as a national or international center of learning. Students from every part of the country and many parts of the world are now part of the University, at every level of study.

Of the University’s more than thirty thousand alumni, nearly half live outside of New York State. And more than eight hundred are residents or citizens of other countries.

They project, wherever they are, an image that is neither conforming nor uniform. Yet all reflect the aggregate of experience and exposure that comes from shared goals and accomplishments. Like the University, with its many autonomous but interconnected colleges, alumni are both products of and contributors to the challenge of meliora.

Variety in opportunity

The College of Arts and Science, the oldest of the University’s academic units, provides undergraduate and graduate courses in the humanities, the natural sciences, and the social sciences. It offers degree programs in 25 fields. Undergraduate programs of study lead to either a Bachelor of Arts or a Bachelor of Science degree.

The College of Business Administration is a professional college for upperclassmen and graduate students. It offers courses leading to a Bachelor of Science with a major in accounting, business economics, or management science.

The College of Education provides undergraduate and graduate courses in teacher education. The Bachelor of Science with majors in elementary or secondary education is offered.
The College of Engineering and Applied Science is a professional college for upperclassmen and graduate students. Its curriculum leads to the Bachelor of Science degree. Students may elect a major in chemical engineering, electrical engineering, mechanical engineering, and in optics. In addition, this College serves as the base for a broad range of research activities and an organized program of service to industry through consultation, seminars, and conferences.

The Eastman School of Music offers a diverse curriculum leading to undergraduate and graduate degrees in performing, conducting, composing and music education.

Department of Nursing, School of Medicine and Dentistry, in addition to its graduate program offers study leading to the Bachelor of Science with a major in nursing.

University School of Liberal and Applied Studies provides University-level education for those whose needs are special and are not met by the programs of other divisions of the University. To accommodate such students, most classes are held in the late afternoons, evenings or on Saturdays. A number of courses not given regularly in the College of Arts and Science are available in The University School and are open to students from all colleges.

The University School offers the opportunity for part-time study leading to the degrees: Bachelor of Science with a major in General Studies; Master of Science with a major in General Studies with options for part-time study in applied mathematics, chemical engineering, electrical engineering, materials science, mechanical and aerospace science, and statistics. Work leading to the Master's degree in any of these fields can normally be completed in three to four years. All courses for these programs are offered during evening hours.

Evening Session is designed primarily for part-time students. The College of Arts and Science and the College of Engineering and Applied Science offer programs leading to the Master's degree; the Colleges of Business Administration and Education provide graduate and undergraduate instruction.
Part-time students planning to earn the Bachelor's degree in the Colleges of Business Administration, Education, Engineering and Applied Science and Department of Nursing are registered in the University School of Liberal and Applied Studies until admitted to the school or college of their choice.

Summer Session classes are offered on the River Campus and at the Eastman School of Music. Undergraduates at the University of Rochester and from other colleges and universities may take summer instruction and transfer the credits earned to their own institutions. Courses of interest to teachers, nurses and others who need or desire to do regular college work during the summer are included in the River Campus summer sessions.

GRADUATE STUDIES
Almost one-third of the students on the River Campus are engaged in full-time graduate study or research throughout the University. Each school or college is responsible for approval of programs recommending candidates for Master's degrees. The work for the Doctor of Philosophy degree is under the general control of the University Council on Graduate Studies. Each college has an Associate Dean to administer graduate studies.

The following is a summary of the advanced degrees offered by each of the University's schools and colleges:

The College of Arts and Science: Doctor of Philosophy in the following departments: Anthropology, Biology, Chemistry, Economics, English, Foreign and Comparative Literature, Geological Sciences, History, Languages and Linguistics, Mathematics, Philosophy, Physics and Astronomy, Political Science and Psychology.

Master of Arts and/or Master of Science are awarded in these departments. The Master of Arts is given in the Departments of Fine Arts and Sociology; the Master of Science, in Statistics.

The Center for Brain Research offers the degree Doctor of Philosophy in Neuroscience and a Ph.D. in Neurobiology as a joint degree with any of the following departments: Biology, Psychology, Electrical Engineering (College of Engineering), Physiology, Anatomy (School of Medicine and Dentistry).

The College of Business Administration: Master of Science with a major in Business Administration, Master of Business Administration and Doctor of Philosophy with a major in Business Administration.

The Eastman School of Music: Doctor of Philosophy, Doctor of Musical Arts, Master of Arts and Master of Music.


The College of Engineering and Applied Science: Doctor of Philosophy and the Master of Science degrees in Chemical Engineering, Electrical Engineering, Mechanical and Aerospace Sciences and Optics.
The School of Medicine and Dentistry: 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, New York 14620.

The Department of Nursing of the School of Medicine and Dentistry offers a program leading to the degree Master of Science in Nursing Education. Information may be obtained from the Director of Graduate Studies, Department of Nursing, University of Rochester, Rochester, New York 14620.


Detailed information on the University's graduate programs can be found in the bulletin Graduate Studies. Application forms and bulletins may be obtained by writing to the Secretary of Graduate Admissions, Administration Building, University of Rochester, Rochester, New York 14627.

THE EASTMAN SCHOOL OF MUSIC

The Eastman School of Music is located in downtown Rochester and is known throughout the world as a prime center for the training of professional musicians as well as for the study and creation of music. Eastman alumni include a substantial number of today's most respected performers and composers. The School has been the leading source of first-chair players in American orchestras as well as of deans and directors of conservatories and music schools in all parts of the country.

Judged by the highest professional standards, the Eastman Wind Ensemble and Eastman Philharmonia, composed entirely of student performers have achieved world-wide recognition through their numerous recordings and international tours. They have served the cause of American music notably. The Eastman Opera Theatre produces several operas each year.

The School's Sibley Music Library houses the largest collection of music literature and source materials to be found at any music school in the world. It includes autographed scores of masters of the past as well as many contemporary composers. The 3,355-seat Eastman Theatre and the more intimate 490-seat Kilbourn Hall, both acoustically excellent, are used for local and visiting professional performances as well as for School functions.

The Eastman School's reputation was earned by the total commitment of an exceptional faculty to the uncompromising ideal of the total musician. Under its present Director, the distinguished American conductor Walter Hendl, the Eastman School is building on its solid
base of past achievements. To broaden its scope in all fields, it is increasing its renowned artist faculty and exploring new directions in composition, musicology, educational techniques and areas of performance. Outstanding figures in all phases of musical activity are invited to the School to share their knowledge and experience with the 400 undergraduates and 200 graduate students.

THE MEDICAL CENTER

The University Medical Center, covering 60 acres adjacent to the River Campus, was among the first in the country to house both medical school and hospital in a single building. The School of Medicine and Dentistry offers programs in medical sciences which lead to the M.S. and Ph.D. degrees as well as the M.D. degree. Its extensive facilities provide an excellent spectrum of patient care and research to support the educational opportunities. One part of the Medical Center is Strong Memorial Hospital with a capacity of 700 patient beds. Also located in the University Medical Center is Helen Wood Hall which contains academic and residence facilities of the Department of Nursing of the School of Medicine and Dentistry.

The closeness between the resources and faculties of the River Campus and the Medical Center makes possible many occasions for students on one campus to pursue their special interests with the faculty or facilities of the other campus. For example, students at the River Campus have access to the medical school library, a division of the University library, located at the Medical Center, and some students attend courses or pursue special studies with faculty members at the medical school.

THE MEMORIAL ART GALLERY

The Memorial Art Gallery serves as the art center for students and for the entire population of the surrounding area. It shares the Prince Street campus with the Eastman School of Music. The Gallery’s increasingly important permanent collection totals 40,000 works valued at $4,000,000. The collection includes paintings, sculptures, frescoes, tapestries and other art treasures. This collection serves as an invaluable teaching aid to the University’s Fine Arts Department.

Educational services of the Art Gallery include scholarships for talented children, special classes for the handicapped and aged, a lending library of more than 300 original art works and lectures and demonstrations both at the Gallery and at schools, hospitals, industrial plants and other institutions. The Gallery also presents a varied schedule of visiting exhibitions throughout the school year. The annual Clothesline Show, one of the nation’s largest outdoor art shows, encourages active pursuit of art by amateurs and professionals alike.

The Gallery’s Creative Workshop has an enrollment of 1500 in painting, sculpture, ceramics, weaving, enameling, jewelry and printmaking classes.
THE RIVER CAMPUS

The River Campus is located in a park-like setting near enough to the heart of the city of Rochester to interchange with it the many advantages of both. Students and faculty benefit from the resources of Rochester and the city warmly responds in its relationship with the University.

Among the facilities on the River Campus are:

**Rush Rhees Library**: The bulk of the University's 1,000,000 volumes, 10,000 current periodicals, Departments of History, Fine Arts, and gallery.

**Morey Hall**: Office of Dean of Student Life, University Office of Counseling and Special Services, administrative offices of the College of Arts and Science, classrooms and offices of Departments of English, Foreign and Comparative Literature, Psychology and Center for Brain Research in the annex.

**Lattimore Hall**: Chemistry Department, laboratories and classrooms.

**Dewey Hall**: Departments of Biology and Geological Sciences, and the College of Business Administration.

**Hoyt Hall**: Lectures, special meetings and conferences.

**Bausch and Lomb Hall**: The Departments of Physics and Astronomy, Mathematics, and Optics.

**Harkness Hall**: NROTC and AFROTC units and offices of the Departments of Anthropology, Economics, Political Science and Sociology.

**Gavett Hall**: The College of Engineering and Applied Science.

**Hopeman Engineering Building**: Offices and laboratories of Departments of Electrical Engineering, Mechanical Engineering and Aerospace Studies and laboratories used by the College of Education.
Taylor Hall: The College of Education.
Computing Center: Ground floor of Towne House Motel.
Administration Building: University administrative offices, offices of Admissions and Student Aid, the Registrar, Cashier, and the University School of Liberal and Applied Studies.
Strong Auditorium: Two halls used for assemblies, lectures, Chapel, stage productions and concerts.
Todd Union: Offices and meeting rooms for extracurricular groups, Post Office and snack bar.
Frederick Douglass Building: Student dining hall, lounges, meeting rooms, the University Bookstore, Placement Office and Faculty Club.
Alumni Gymnasium: The Department of Physical Education and athletic facilities.
Fauver Stadium: A permanent grandstand accommodating 6,000 spectators, and within the structure, the Department of Languages and Linguistics and the Sculpture and Painting Studios.
Women's Residence Halls: Four units with room, board and recreation facilities for 630 women.
Anderson Tower and Wilder Tower: Nine-story residence halls for junior-senior men and women and faculty apartments.
Crosby, Burton, Lovejoy, Hoeing, and Gilbert Halls: Residence halls with accommodations for 1,000 men. The Department of Philosophy is located in Lovejoy.
Tiernan Hall: Residence for women.
Fraternity Quadrangle: Houses built by nine fraternities under a restricted agreement with the University.
Women's Gym
Particle Physics Building: Research facilities for the Particle Physics-Cosmic Ray Research Program.
Cyclotron Complex
de Kiewiet and Valentine Towers: Housing graduate and undergraduate students.

Approximately $50 million in new construction currently is underway at the University. Principal projects on the River Campus include expansion and remodelling of Rush Rhees Library, which will double the capacity of the Library; and construction of a Space Science Center building, a chemistry-biology building, a mathematical sciences building, an Interfaith Chapel, and additional undergraduate dormitories. Planning is underway for a University Commons, new facilities for psychology, and additional facilities for the humanities, the social sciences, the College of Education, and the College of Business Administration.
In four years at the University of Rochester, a student may call on countless members of the University community. Some offer assistance in the academic area—in choosing courses, developing better study habits and selecting a career. Others provide guidance in the activities and programming areas by orienting students to the social, educational and recreational opportunities on campus and in the community, and by planning and guiding students with residence and all-campus programs. A few specialized services provide assistance in such matters as arranging a loan, locating a part-time job or obtaining a graduate fellowship.

Occasions also arise when a student needs help in working out personal problems and in adjusting to the demands of university life. A wide variety of staff members is available to help students explore these important areas.

The services provided by the Office of the Associate Provost for Student Affairs are available to all students and their maximum use is encouraged.
ADMISSIONS

The University seeks young men and women of character, ability and promise who have a capacity for intellectual growth and the motivation to achieve. Careful consideration is given to all the evidence presented by a candidate for admission including the secondary school record, the results of College Board tests, the school's recommendation and the student's participation in school and community affairs. A conscientious effort is made to select a class varied in interests, talents and goals, and in social and economic background.

Admission to undergraduate programs of study is under the direction of the Committee on Admission.

Recommended Subject Preparation

The quality of the applicant's secondary school record is more important than any prescribed pattern of courses. Sound preparation includes the study of English with continued practice in writing, social studies, foreign languages, mathematics and the laboratory sciences. Additional weight is given to secondary school courses generally known as enriched, honors and Advanced Placement.

Applicants for admission to engineering and science programs should include as much mathematics and laboratory science work as possible within the limits of their secondary school offerings.*

Application procedure

All applications must be made on forms which are provided on request, and accompanied by a non-refundable application fee of $15. Instructions for completing the application for admission are included with all application forms.

Applications should be submitted by January 15 of the final year in secondary school. Applicants are required to take the College Entrance Examination Board Scholastic Aptitude and Achievement Tests either in December or January. (See Scholastic Aptitude and Achievement Tests, below.)

Applicants for the Bachelor of Arts degree with concentration in music should request application forms from the Director of Admissions of the River Campus Colleges. The forms for this program include a supplementary resume 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 of the River Campus Colleges. Applicants should communicate directly with the Director of Admissions, Eastman School of Music, to arrange an audition or recording. Decisions on applications for admission to this program are made after the musical qualifications of the candidate have been evaluated by the Eastman School of Music Admissions Committee. These applicants pay the regular application fee.

*Chemistry is required as preparation for the B.S. degree in Chemistry, Chemical Engineering and Biology, and is recommended for the B.S. degree in Nursing. Physics is required for the B.S. degree in Physics and Astrophysics and recommended for all departments in the College of Engineering and Applied Science.
Personal Interview

Applicants are encouraged to visit the campus whenever possible. Although not a requirement for admission consideration, an informal conference is usually very helpful in making college plans. It affords the applicant an opportunity to gain a first-hand impression of the college. Appointments may be arranged by letter or telephone throughout the year except for February, March and early April when applications are being processed.

The Admissions Office is open for interviews on weekdays from 9 a.m. to 5 p.m. and on Saturdays from 9 a.m. to noon. It is closed on Saturdays from the middle of June to the middle of September.

Scholastic Aptitude and Achievement Tests

All applicants for admission as freshmen are required to take the Scholastic Aptitude and Achievement Tests, offered several times a year by the College Entrance Examination Board at centers throughout the world.

Applicants for admission should take the Scholastic Aptitude Test no later than January of their senior year in secondary school.

The Achievement Tests should be taken in English Composition and in two other fields related to those which the student will probably study in college. For example, an appropriate test pattern for engineering and science candidates is English Composition, Mathematics and Chemistry or Physics. Applicants may offer Achievement Tests in either the junior or senior year. Ordinarily, students will find it to their advantage to take these tests in December or January of the senior year in continuing subjects (English, foreign language and mathematics) and in May of the junior year or in July in subjects completed that year. Application to take these tests should be made to the College Entrance Examination Board at least three weeks before the scheduled date.

Application forms for the tests and a Bulletin of Information may be secured from secondary schools or the College Entrance Examination Board, Box 592, Princeton, New Jersey 08540, or the Board’s Pacific Coast Office, Box 1025, Berkeley, California 94701.

Notification of Action on Applications for Admission

Applicants are notified of action taken on their applications for admission and, where appropriate, for financial aid by the middle of April. No action is taken on an application until it is complete in detail.

Candidates’ Reply Date, May 1

The University of Rochester subscribes to the Candidates’ Reply Date. This procedure has been established to provide ample time for students to reach a decision on college choice. Admitted students are required to notify the University of acceptance of admission on or before the Candidates’ Reply Date, May 1.
Early Decision Program

Well-qualified applicants for admission who decide that Rochester is the college of their choice may apply for an early decision upon their application for admission.

To be eligible for early action the applicant must:

1. Submit formal application for admission before November 1, including scores of the Scholastic Aptitude Test.

2. Submit scores of any Achievement Tests taken before November 1. If the applicant has not taken three Achievement Tests, he should do so by March of his senior year in secondary school.

3. Present certification by the secondary school that application is being made only to the University of Rochester.

Candidates are notified of the decision of the Committee on Admissions by December 1 and are expected to make formal acceptance of the offer of admission by January 1. Those applying for financial aid should file the Parents' Confidential Statement by November 1. Notification of action taken is mailed by December 15.

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

Advanced Placement

The University of Rochester recognizes work completed in the Advanced Placement Program. Judgments concerning placement in courses and the award of credit for Advanced Placement achievement are made by the academic departments. Satisfactory performance in Advanced Placement courses may be used to fulfill degree requirements. Students are informed of these decisions before they register for the first semester.

Readmission

Students who withdraw from the University or are separated for any reason and wish to re-enter, apply through the Office of Admissions. Applications for readmission are reviewed by representatives of the various Colleges and the office of the Dean of Student Life.

Students who appear ready to resume their programs with profit are generally approved for readmission, subject to space limitations in departments and residence halls. For best consideration, readmission applications should be filed at least a month before the beginning of the term in which the student plans to re-enter.

Admission of Transfer Students

Students from other colleges or universities are ordinarily admitted only at the beginning of the fall semester. Candidates for transfer must meet the admission requirements of the particular college or department to which they are applying. Ordinarily, a student admitted to the College of Arts and Science must be in residence for a
minimum of two years before he shall be considered eligible for the Bachelor's degree. Courses completed in summer school and University School do not fulfill the residence requirement.

The Colleges of Business Administration, Education, and Engineering and Applied Science, and the Department of Nursing, require a minimum of one year in residence. Credentials must include a statement of honorable dismissal and evidence that previous academic work has been of distinctly high quality. Credit for work at other institutions includes only those subjects which can reasonably be accepted as the equivalent of course work the applicant plans to pursue at Rochester. Transfer applications are reviewed beginning in April and notification is sent to candidates as soon as circumstances permit. For best consideration completed applications should be filed no later than July 15.

Financial aid is available to transfer students. Preference is given to students who enter from two-year colleges and those who enter professional programs (Business Administration, Education, Engineering, Nursing). Application forms for financial aid are available from the Office of Admissions and Student Aid.

Students admitted with advanced standing from other colleges and universities are required to report for a brief orientation program to assist them in adapting to a new college environment.

Special Students

Students desiring to pursue a special course not leading to a degree are admitted only for extraordinary reasons. Ordinarily special students are limited to persons holding a degree from a recognized college. Special students are subject to all general regulations and pay a tuition fee based on the current semester hour charge and all incidental fees attached to any course they take.

Summer Orientation Program for Freshmen

Freshmen are urged to participate in a two-day summer program to help them plan and register for fall semester classes. Placement examinations are given, and faculty members are available for assistance in program planning. In addition, students can familiarize themselves with campus facilities. For students unable to attend one of the four summer programs, a special session is scheduled at the beginning of Freshman Week.

FINANCIAL AID

The University maintains a strong program of financial aid to assist students who could not otherwise attend Rochester. Through a careful allocation of the resources at its disposal, the University makes every attempt to help all deserving applicants for financial aid.
A general discussion of student aid follows. For a more comprehensive description, including a listing of all available scholarships, applicants may request a copy of the booklet *Financial Aid for Undergraduate Students* from the Office of Admissions and Student Aid.

**Basis for Awards**

Student aid, especially in the form of scholarships, is awarded on the basis of merit. The amount of individual stipend is based upon financial need, and takes into consideration the reasonable contributions from parents and the applicant himself toward meeting college costs. Applicants automatically are considered for all types of assistance for which they are qualified and eligible.

**Making Application**

Applicants for financial aid must indicate their request for consideration at the appropriate section of the application for admission. No other special forms are required, but the applicant must submit the Parent’s Confidential Statement to the appropriate regional office of the College Scholarship Service. Statements ordinarily are available from the secondary school; copies may also be secured from the Office of Admissions and Student Aid.

**Notification**

Notification of action taken on an application for financial aid accompanies the offer of admission in mid-April. The amount of financial assistance is subject to adjustment should the applicant receive scholarship assistance outside the direct administration of the University, but the degree of adjustment will vary depending upon the size and conditions of the outside award. Often the adjustment simply will provide a revised combination of aid, whereby, for example, an outside scholarship may be substituted for a previously granted loan.

While the student may rightfully anticipate the continuation of financial assistance for his four undergraduate years, awards are granted on an annual basis, and a renewal application must be submitted each spring. In reviewing applications for renewal of awards, the Committee on Student Aid takes into account the student’s academic performance, his contribution to campus life, and evidence of his own efforts to meet college expenses.

**University Scholarships**

Scholarships administered by the University are listed in the booklet *Financial Aid for Undergraduate Students* mentioned previously. This list includes general and endowed scholarships, and also those awards under the sponsorship and support of individuals or groups such as national corporations. If an applicant is aware of his eligibility for a particular scholarship requiring special qualifications (for example,
residence in a certain community or specific employment of a parent), he should write the Director of Admissions and Student Aid requesting consideration for that particular award.

**Federal Financial Aid**

The University is an approved participant in the National Defense Student Loan, Nursing Student Loan, College Work-Study, and Educational Opportunity Grant programs of the federal government. Approved by acts of Congress, these programs make funds available for grants, loans, and campus employment to help meet college costs. The administration and authorization of this federal financial assistance rests with the University, however, and awards are made in the best judgment of the Committee on Student Aid. Preference is given to those students whose financial need is greatest.

**Part-time Employment**

To help defray college expenses, many undergraduates hold part-time jobs during the academic year, either on or off campus. In addition, almost all students work during the summer.

Furthermore, many students are given guaranteed assurance of a job requiring 10-15 hours per week as part of a financial aid "package." Such employment will be within the federal College Work-Study program mentioned above, or in the University's own Work Scholarship program, a plan by which the student receives a $550 advance award, $350 of which is earned during the year in an on-campus job, combined with a $200 scholarship grant.

Finally, the Office of Admissions and Student Aid will help any student interested in obtaining employment and maintains an open job-file at all times.
Loans to Students

National Defense and Nursing Student Loans have been mentioned above as a means of meeting financial need. It should be added that a desirable aspect of these loans is the "forgiveness" feature, making it possible for students who enter either teaching or nursing to substantially reduce their indebtedness under these programs. Again, these loans are authorized by the University to those students who satisfy certain eligibility requirements.

Another loan program gaining wide acceptance by student borrowers is the federal Guaranteed Loan Program, a feature of the Higher Education Act of 1965. Now operative in most states, this plan permits students to borrow up to $1500 per year, with generally less rigorous requirements of demonstrated financial need. Unlike National Defense Student Loans, the University does not allocate this type of loan as part of a financial aid package. Rather, the student seeks a lender of his choice to initiate the loan. Further information and application blanks are available most readily from hometown banks.

Finally, the University itself makes loans available to students needing additional assistance to meet educational expenses. In addition, short-term emergency loans, ordinarily for non-educational purposes, may be utilized from a fund maintained for this purpose by the Dean of Student Life.

Loans to Parents

Many parents, including those of students who receive no financial assistance, find it advantageous to amortize the cost of education by making monthly payments on a loan for educational purposes. In the judgment of the University's financial aid administrators, the local bank with which the parent does business is an excellent source of educational loan plans of relatively low cost, with the added advantage of personalized service and flexibility.

In addition, several commercial lending agencies specialize in educational loans on a national basis. These plans provide a further source of deferred payment of college costs, and also frequently include insurance features which provide for an uninterrupted availability of funds in the event of the disability or death of a parent or guardian.

A few of these agencies with which the University is familiar are listed below. Interested parents may request additional information directly.

Education Funds, Inc., 10 Dorrance Street, Providence, Rhode Is.
Funds for Education, 319 Lincoln Street, Manchester, N. H.
Richard Knight Agency, 6 St. James Avenue, Boston, Mass.
Tuition Plan, Inc., 575 Madison Avenue, New York, N. Y.
EXPENSES

While educational expenses continue to rise, reflecting mounting costs of quality education and general economical trends, changes in these costs are always accompanied by adjustment in available financial aid, making enrollment at Rochester accessible to any qualified student, regardless of financial circumstances.

Furthermore, in a very real sense every student receives some financial help, inasmuch as the cost of a college education far exceeds the tuition charged to the students. Remaining education costs are met through income from the University's endowment and through the financial support of alumni, friends, corporations, foundations, and government.

Fixed Costs

Tuition for full-time undergraduates, except junior and senior nursing students, is $2300 per year. A room in a campus residence hall, including linen service, is $500 per year, and participation in the University board plan is $600 per year.

A compulsory health fee of $40 per year is charged to all students, with an additional $17 for an extended-coverage medical insurance plan for those students no longer covered by a family-plan policy held by their parents. Freshmen incur a one-time charge for meals and accommodations during summer orientation.

All students pay an activity fee which varies annually according to the judgment of the student government. This fee has averaged $35 in recent years.

Fixed Cost Summary 1968-69

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuition</td>
<td>$2300</td>
</tr>
<tr>
<td>Room</td>
<td>500</td>
</tr>
<tr>
<td>Board</td>
<td>600</td>
</tr>
<tr>
<td>Fees (approximately)</td>
<td>85</td>
</tr>
<tr>
<td><strong>TOTAL ANNUAL FIXED COSTS</strong></td>
<td><strong>$3485</strong></td>
</tr>
</tbody>
</table>

One-half of the annual fixed charge is payable to the Bursar at the beginning of each semester. Allowable credits, however (such as University scholarship stipends, state scholarships, National Defense Loans), may be deducted in advance with only the net balance due and payable in cash.
Estimated Student Budget

In addition to the fixed costs mentioned above, variable costs are of course incurred by all students, and differ widely according to the financial circumstances and personal spending patterns of the individual undergraduate.

Financial aid awards are predicated upon an estimated annual resident student budget of $4000, an estimate which includes allowances for books, travel, recreation, and personal expenses.

Commuting students, who live with their parents in the greater Rochester area, may estimate an annual budget of $3050 which deducts the cost of on-campus room and board but includes an additional allowance for lunches and local travel.

UNIVERSITY COUNSELING AND SPECIAL SERVICES

Counseling

Students concerned about vocational choice, educational goals, or personal matters may consult a counselor by scheduling an appointment with the receptionist in the counseling service in Morey Hall. If tests are required as part of the counseling process, they are assigned during a student's conferences with a counselor. In an emergency an appointment can be scheduled almost immediately, but a waiting period of a week to 10 days for an initial appointment is customary.

Testing

In addition to tests given as part of counseling, many other testing programs and services are administered through the counseling center. Information about the following tests is available at the receptionist's desk in Morey Hall:

- Graduate Record Examinations
- Miller Analogies Tests
- Medical College Admissions Test
- American Dental Association Aptitude Test
- Law School Aptitude Test
- National League for Nursing Examinations
- Admission Test for Graduate Study in Business (ATGSB)
Questions about other national testing programs should be directed to the counseling center. If the test involved is not given there, they will direct the student to the proper location.

**Placement and Post-College Planning**

Students who want to discuss job opportunities or further career training beyond college are advised to visit the Placement and Post-College Planning Office in the Men's Dining Center. Much of the work in this office deals with job placement of students currently completing degrees, but the staff is eager to discuss career plans with students and graduates at all levels.

Industrial literature, occupational information, and educational materials (including a collection of college bulletins) may be obtained at the Career Information Center in the Men's Dining Center during regular University office hours. A receptionist is on duty to help locate information and to answer questions. She also has information on fellowships and programs such as VISTA and the Peace Corps.
Reading and Study Skills

The basic program in the Reading and Study Skills Laboratory consists of a 10-week period of practice, classroom instruction and diagnostic testing. Attention is given to increasing understanding of words and verbal concepts, developing the ability to vary depth of understanding and rate of reading to fit the purpose for which a student is reading.

Foreign Students

The Foreign Student Adviser, in the Foreign Student Office, counsels students from outside the United States on their programs, living conditions, and any problems they meet while studying at the University. Foreign students should feel free to consult the Foreign Student Adviser on all matters relating to their period of study here.

UNIVERSITY HEALTH SERVICES

The health of the student body is under the care of the physicians of the University Health Services. The out-patient department for all students is in the medical office located on the ground floor of X Wing in the Medical Center. Infirmary facilities for both men and women are located on campus, first floor of Morgan Wing in the Women's Residence Halls. The infirmary is staffed by the department's physicians and registered nurses and is open 24 hours daily for the treatment of all types of illness. In case of serious illness or injury students are referred directly to Strong Memorial Hospital, or transferred from the infirmary to the Hospital upon the recommendation of the University Health physicians. Short-term psychiatric care and consultation are available in the medical office on campus.

All full-time students are entitled to the physicians' services and to such out-patient and infirmary care as may be considered necessary by the physicians. If referred by the University Health Service, the student may be hospitalized for 10 days in Strong Memorial Hospital at semi-private rates and be eligible for $250 in extra charges either as an in-patient or in the out-patient clinics of Strong Memorial Hospital. Elective surgery, refractions and dental care are not provided under the program. If a student prefers to go to a private physician or to a hospital other than Strong Memorial, the cost of such treatment and care becomes his responsibility.

In addition to these Basic Student Health Benefits, all full-time students of the University are required to carry health insurance, not only in case of illness or injury throughout the year, but also to provide coverage while they are not in attendance at the University. The University sponsors such a supplemental insurance plan at a premium of $17 per year for single students. To be covered, all entering students must submit a pre-entrance health evaluation by their own physician on a form sent to them with their notification of admission to the University.
The College of Arts and Science

Administrative Officers

Kenneth E. Clark, Ph.D. (Ohio State) Dean
Ralph A. Raimi, Ph.D. (Michigan) Associate Dean for Graduate Studies
Lawrence Wm. Kuhl, Ph.D. (Western Reserve) Associate Dean
Mark B. Beach, Ph.D. (Wisconsin) Associate Dean
Marian A. McClintock, Ed.M. (Rochester) Secretary to the College
Miriam B. Rock, B.S. (Rochester) Assistant to the Dean
Elizabeth A. Provenzano Administrative Assistant for Academic Advising
Janet Howell Clark, Ph.D. (Johns Hopkins) Dean Emeritus of the College for Women
Lester Oatway Wilder, M.A. (Harvard) Dean Emeritus of the College for Men

The University of Rochester believes that liberal education is an essential foundation for all applied study. The goal of the College of Arts and Science is to provide students with the perception, skills and knowledge they will need for fulfillment in career and community. The College of Arts and Science is dedicated to the study and teaching of educational fundamentals at the undergraduate and graduate levels as well as conduct of original research. Its curriculum represents the basis for areas of concentration in the University's schools and colleges and preparation for post-graduate professional study.

Study in the Colleges of Business Administration, Education, Engineering and Applied Science, and the Department of Nursing in the School of Medicine and Dentistry is predicated on the successful completion of basic course work in the College of Arts and Science.

BACHELOR OF ARTS DEGREE

The College offers courses leading to the degrees of Bachelor of Arts and Bachelor of Science. The B.A. program is directed toward a broad, comprehensive education, with special attention to the integration of many areas of study.

Within this B.A. program, the following concentrations are offered:

- Anthropology
- Astrophysics
- Biology
- Chemistry
- Chinese (Literature)
- Classics (Literature)
- Economics
- English
- Fine Arts (Art History, Studio Arts)
- French (Language or Literature)
- General Science
- Geological Sciences
- German (Language or Literature)
- History
- Linguistics
- Mathematics
- Music
- Philosophy
- Physics
- Political Science
- Psychology
- Russian (Language or Literature)
- Sociology
- Spanish (Language or Literature)
- Statistics
Requirements for the degree Bachelor of Arts are as follows:

1. Registration at the University of Rochester for eight semesters as a full-time student and the successful completion of a minimum of 32 courses of work offered in the College with an average grade of "C" or better. Approved course work taken outside the College may be counted as part of the course requirements. Normally, at least four semesters must be spent in full-time residence in the college.

2. The successful completion of a course in English in which emphasis is given to the reading and writing of effective prose. Any 100 level English course (except courses numbered 115-129) may be taken to satisfy this requirement. Entering students are advised by the English Department in the selection of courses. Students may occasionally be exempted from this requirement at the discretion of the department.

3. A student must show proficiency in an ancient or modern foreign language. Some students entering with three years or more of high school study in one language may satisfy the foreign language requirement on the basis of their proficiency examination score. Normally, work done by a student in high school will determine the level at which course work may be continued in College. Students may obtain advice concerning courses from the Department of Languages and Linguistics. Before the end of the first two weeks of class it will be possible for a student to petition the chairman of the Department of Languages and Linguistics for admission to another level.

4. A broad distribution of courses over a number of departments. To meet the minimum requirements for distribution, students must complete two courses in each of the two groups outside the area of concentration:

   **Group I—**Humanities: East Asian Studies 101, English (except 115, 116, 123, 124, 126, 128), Fine Arts, Foreign and Comparative Literature, Languages (except foreign language courses numbered 101 or 102), Music, Philosophy (only 103, 104, 204, 211, 241, 244), Religion.
Group II—Social Sciences: Anthropology, East Asian Studies 102, Economics, History, Linguistics, Philosophy (except courses listed under Group I above), Political Science, Psychology (only even-numbered courses), Sociology.

Group III—Natural Science: Astronomy, Biology, Chemistry, Geological Sciences, Mathematics, Physics, Psychology (only odd-numbered courses), Statistics.

These additional notes concerning distribution requirements apply:

1. Course work offered in Aerospace Studies, Naval Science or Physical Education may not be counted toward the distribution requirements; nor may course work taken in the College of Business Administration, Education, Engineering and Applied Science, and in the Department of Nursing.

2. Freshman Preceptorials may be used to meet distribution requirements; some are not readily classified. In cases of doubt, the student should write to the Dean of the College for clarification.

3. Students are not required to complete distribution requirements during the first two years. A delay may provide the student an opportunity to plan a more interesting program and to investigate possible areas of concentration.

4. Courses included in a student’s program to meet the English requirement, the foreign language requirement, or distribution requirements, may not be taken under the Satisfactory-Fail option.

Note: The student is responsible for planning his own program to assure that all requirements for the degree are met.

5. The successful completion of one semester in Physical Education. Normally, students are expected to meet this requirement in their first year; they may be excused from this requirement or be given a modified program upon the recommendation of the University Medical Officer.

6. The satisfactory completion of work in a program of concentration approved by the major department. This normally includes 6-8 courses within the major department and 2-4 courses in an allied field. A student who plans to complete requirements for the B.A. degree with a major in some department of the College must make formal application to that department at the end of the sophomore year. Before undertaking a concentration, a student should generally have completed at least 16 courses with a grade average of 2.0 or better and have completed the prerequisite work specified by that department with grades of "C" or better.

Students who have failed to meet these requirements by the end of the junior year or who are not doing "C" work or better in the
concentration up to that time, will not be considered to be making satisfactory progress toward the degree and are subject to separation from the College.

Once having begun a program of concentration, it is possible to change to another; however, additional coursework may be required. Before deciding to change a selected area of concentration, the student is urged to discuss his plans with his adviser. If transfer to another department is advisable, the student must apply officially to the new department, using the standard Concentration Approval Form available at the College Program Advising Office in Morey Hall.

7. Students may be required by their departments of concentration to pass a comprehensive examination or an approved substitute which is administered before the completion of the senior year. These examinations generally test the student’s knowledge of his field of concentration and his ability to correlate material from a variety of educational experiences. During the semester in which a student writes a comprehensive examination, he is excused from taking final examinations in courses within his concentration program. He can be excused from final examinations in other courses only at the discretion of the instructor.

If a student fails the comprehensive examination and does not succeed in passing another or an approved substitute before the completion of the ensuing academic year, he is dropped from the College without his degree.

Seniors in the Honors Program, and seniors in absentia at approved medical or dental schools are exempted from the comprehensive examination requirements.

BACHELOR OF SCIENCE DEGREE

Programs leading to the degree of Bachelor of Science are offered in the following areas of concentration:

- Astrophysics;
- Biology-Geology;
- Chemistry;
- Geological Sciences;
- Physics.

The requirements for the Bachelor of Science degree are the same as those for the B.A. degree with these exceptions:

1. The number of courses which must be completed successfully varies from 32 to 36. Students should check the synopsis of requirements accompanying the course listing of those departments offering the B.S. degree;

2. Certain departments recommend specific languages for their B.S. candidates. Students should check the statement accompanying course offerings for details.
3. While comprehensive examinations or approved substitutes are not normally required of B.S. candidates, a department may deem them appropriate.

All undergraduate students on the River Campus are enrolled in the College of Arts and Science for their first two years. The College of Arts and Science offers most of the preliminary work in programs leading to the Bachelor of Science degree conferred by:

1. The College of Business Administration (majors in Accounting, Business Economics and Management Science).
2. The College of Education (majors in Elementary Education and Secondary Education).
3. The College of Engineering and Applied Science (majors in Chemical Engineering, Electrical Engineering, Mechanical and Aerospace Sciences, and Optics).
4. The Department of Nursing of the School of Medicine and Dentistry.

HONORS PROGRAM

The Honors Program aims to increase opportunities for an active education. Honors work is designed especially for those students who seek fresh challenges in independent study. Students work in seminar groups or as individuals to investigate problems intensively. They prepare more papers or reports than is feasible in conventional courses. The Freshman preceptorial course is a natural antecedent to Honors work; both are excellent preparation for graduate study. Honors offers the maximum chance to sample the rewards of academic intimacy and independence.

The Bachelor of Arts degree with Honors is offered in the following areas of concentration: Biology; Economics; English; History; Linguistics; Philosophy; Political Science; Sociology.

Although each department offering a degree with Honors will establish its own requirements for the degree and criteria for admission, normally, the following general regulations apply to Honors candidates: the student will undertake work in Honors or senior seminars, in graduate courses, or in Honors reading or research courses; during the junior and senior years, the student may register for no more than the equivalent of 40 hours credit in the department of concentration; the student may register for the equivalent of five courses each semester; students expecting to spend the junior year abroad should be encouraged to begin Honors work in the sophomore year; during the second semester of the senior year students will usually be evaluated by an
outside examiner; and at the end of the second semester of the senior year upon the recommendation of the department and the Honors Executive Committee the student will be awarded the degree with Highest Honors, High Honors, Honors, or Pass.

Students requesting admission to the Honors Program in any area of concentration in which it is offered may obtain the application form at the Program Advising Office, Morey Hall, and consult with the Honors adviser in the proposed area of concentration to arrange a program of study.

Honors courses may be offered by departments other than those offering the degree in Honors. Honors seminars (numbered 300-390) carry one or two course credits; Honors reading and research courses (numbered 391-399) carry one, two, three, or in exceptional cases, four course credit.

Students desiring to enroll in Honors courses may obtain a request form at the Program Advising Office, Morey Hall. Qualified students who are not candidates for departmental Honors may participate in Honors courses or seminars when enrollment permits.

Grades will be assigned in Honors seminars and courses according to the conventional system used in other courses or on the basis of “S” (Satisfactory) or “F” (Failure) if the instructor wishes. The S-F student option does not apply to these courses. The instructor may grade the students himself or request an outside examiner to do so.

INDEPENDENT STUDIES PROGRAMS

All departments permit qualified students to undertake special reading and research courses. Ordinarily, a student may register for such courses only if the department’s offerings do not meet his particular needs and if a member of the faculty agrees to supervise his work. Because each course is individually planned, the student must consult with the department before registering for the course.

Freshman Preceptorial Courses

Selected, well-qualified freshmen are given the opportunity to participate in unique seminar courses offered by a number of departments in the College of Arts and Science and other academic units of the University. Each course is limited in number to 10-15 students who are selected from among those who express an interest in it. Preceptorials include directed reading, seminar discussions and critical reports.

Preceptorials carry full course credit and may be applied toward distribution requirements. Those who may register are notified before the end of the pre-registration period.
Anthropology Department
190. Preceptorial: The Images of Man. Discussion of some of the "exotic" peoples studied by European and American anthropologists; anthropological views of other societies compared with those of historians, biographers, travellers, missionaries, government officers, and writers of fiction.

Economics Department
195. Preceptorial: Value of a Life. The relative values of prolonging life as contrasted with increased productivity or amelioration of pain will be considered against a background of cultural, philosophical, and economic ideas. A historical development will be followed by consideration of factors which have made the cost of health care such an urgent issue today. Omitted 1968-69

English Department
190. Preceptorial: Explorations in the Characterization of Personality. (Offered jointly with Psychology Department.) An investigation of the problems of characterizing and verbalizing human personality. Readings drawn from literature (Shakespeare to Capote) and psychological criticism.

191. Preceptorial: The Literature of Growth. Study of some of the major accounts, fictional and factual, of growing up. Readings from Rousseau to Musil.

192. Preceptorial: The Comic Novel. An examination of the comic novel, from Don Quixote to existential comedy, as it forms a commentary on the nature of fiction.

193. Preceptorial: The Epic Tradition and Modern Literature. A study of the modern artist's use of epic materials and the social implications of the difference between his works and the classical epic.

194. Preceptorial: The Hippies, How They Grew. The examination of Hippie literature and ideology as a study in the history of ideas.

Fine Arts Department
190. Preceptorial: The Art of East and West. A comparative study of masterworks of painting and sculpture. Selected works are analyzed in detail and interpreted with reference to the aesthetic ideals of the civilization which produced them. This course is an introduction to the great traditions of world art.

195. Preceptorial: Exploring the Visual Experience. An investigation into the organization of the visual world and the factors which give it meaning through the study of the use of forms, images, and symbols as developed by visual artists.

Foreign and Comparative Literature Department
COMPARATIVE LITERATURE

FRENCH LITERATURE
131. Introduction to Modern French Literature. Critical readings of representative 19th and 20th century poetry and fiction: practice in the explication de texte method. Prerequisite: satisfactory performance on Placement Examination or in French 103, or permission of the instructor.

Note: In the fall term only, section 1 of this course is offered as a Preceptorial.
turgenev, and dostoevsky; comparison with concepts of
131. Introduction to modern spanish literature. Close
comparisons of innovative problems in each field. Twen­
190. History department
190. Preceptorial: War, revolution, and society. The
role of violence between or within nations, in the historical
192. Preceptorial: science and world affairs. The role
of science and scientists in such aspects of world affairs as
arms control and disarmament, peacekeeping and security,
international programs in science, the actual and potential
role of scientists in relations between the two super-powers.
193. Preceptorial: history of the arts. Close study of
the interplay of art and social attitudes at moments of
historical crisis.
194. Preceptorial: problems in historical analysis. An
introduction to selected analytical theories.
195. Preceptorial: tradition and east Asia. The role
of tradition, historical consciousness, and modernity in
the transformation of Chinese and Japanese societies.
196. Preceptorial: classical civilization. An analysis
of the social, political and intellectual modes in classical
Greece and Rome.
197. Preceptorial: the puritan tradition. Studies in
Anglo-American thought in the Seventeenth Century.
198. Preceptorial: science and history. Comparative
study of the pursuit and products of science at various
times and places, especially in relation to its internal struc­
ture and social, intellectual, and political environment.
199. Preceptorial: indian nationalism. A contemporary
assessment of the search for an Indian identity.
languages and linguistics department
190. Preceptorial: language and the study of lan­
guage. An examination of the nature and function of lan­
guage.
philosophy department
190. Preceptorial: Logical Positivism. A study of A. J.
Ayer's Language, Truth and Logic and its significance in
present-day thought. Omitted 1968-69
problems in the philosophy of mind, including our knowl­
dge of the self and of other selves, and the privacy of
mental states. Readings from three of the most important
recent works in philosophical psychology, viz. Strawson's
Individuals, Hampshire's Thought and Action, and Ayer's
The Concept of a Person. Omitted 1968-69
192. Preceptorial: free will. If a man's action is capable
of being scientifically predicted and explained, then his
action is not free. But all actions are capable of being so
predicted and explained. Thus, no man's actions are free.
The course will involve a critical examination of the fore­
gowing argument and related questions.
Psychology department
190. Preceptorial: explorations in the characterization
of personality. (Offered jointly with english department.)
An investigation of the problems of characterizing and
verbalizing human personality. Readings drawn from liter­
ature (Shakespeare to capote) and psychological criticism.
religion
190. Preceptorial: the elements of Buddhism. Exam­
ination of Buddhist thought and practices from their In­
dian origins to the present-day.
191. Preceptorial: contemporary analyses of religion.
Modern analyses of the nature and function of religion,
with some recent theological responses. Readings in Marx,
weber, freud, and rieff are compared with interpretations
by barth, buber, rubenstein, and cox.
sociology department
190. Preceptorial: social causation. Why are crime
rates apparently increasing? What effect does environment
have on students' grades? Questions like these involve the
study of causal relations. This course will explore the ways
in which sociologists try to answer such questions; it will
emphasize modes of thought rather than the empirical
findings. Omitted 1968-69
192. Preceptorial: Race relations in urban America.
The urban transformation of the Negro American. Goals
and conflict: integration, nationalism, violence. Class
structure and implications for the future.
193. Preceptorial: The Urban Community. Social class,
life style and ethnicity as a basis of community and con­

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TRANSFER TO PROFESSIONAL COLLEGES

Freshmen and sophomores who are enrolled in the College of Arts and Science with the declared intention of transferring to a professional college at the end of the sophomore year are assigned advisers from that College.

Before the end of their sophomore year, students should obtain a Concentration Approval Form from the Program Advising Office (Morey 315), complete it and return it to that office. The student will be notified of acceptance, conditional acceptance or denial.

The transfer procedures for each of the Professional Colleges on the River Campus are as follows:
College of Business Administration

To qualify for admission into the College of Business Administration a student must have completed not less than 16 courses with an over-all grade average of 2.0 (3.0 if applying for the program in business economics) at the University of Rochester or at some other accredited institution. Specific distribution requirements for majors in accounting, business economics and management science are identified in the Business Administration section of the Bulletin. Students from other institutions should apply to the University of Rochester Admissions Office.

College of Education

Students should familiarize themselves with all material regarding the programs in the College of Education. A student may remain in the College of Arts and Science, complete the requirements for a B.A. degree and also satisfy the state certification or licensing requirements for schoolteaching.

A student who is planning a career in education should seek advice from the Director of Academic Advising in the College of Education as early as possible during the freshman year. The state certification and licensing requirements must be met, and they are not the same as degree requirements. The Director of Academic Advising has information on the requirements of various states and can guide the student in planning a program which satisfies these requisites.

College of Engineering and Applied Science

Engineering is unique among the professions in that a significant amount of time in the undergraduate program is devoted to professional studies. Engineering students enroll in the College of Arts and Science for two years and then may transfer to the College of Engineering and Applied Science for the last two years. Students who satisfactorily complete this four-year sequence receive a B.S. degree.

Students seeking a broader training in the liberal arts than is provided in the regular four-year program may enroll in the Two-College Program, under which they spend three years in Arts and Science before transferring to Engineering. Those who complete this five-year sequence satisfactorily may receive both a B.A. and a B.S. degree.

Department of Nursing, School of Medicine and Dentistry

Students intending to complete work for the degree in the Department of Nursing are directed to the requirements, p. 195 of this bulletin.

Members of the Department of Nursing faculty appointed as advisers to students declaring their intention to major in nursing, approve the student's program.
JUNIOR YEAR ABROAD

Students may participate in a year of study abroad during their junior year.

During their absence, they remain on the rolls of the University of Rochester and pay one-fourth the usual tuition. Upon their return, they receive full credit for all work that is successfully completed in accordance with the requirements and recommendations of the major department and the Junior Year Abroad Program Committee. Course number 299 is used on the transcript to record credit earned in this program.

Applications for participation in the Junior Year Abroad program should be filed with the director of the program early in the sophomore year. Information about procedure may be obtained from the Junior Year Abroad office in Morey Hall.

SENIOR YEAR IN ABSENTIA

A small number of students each year elects to spend the senior year in absentia. Prior approval is required and is given upon satisfactory completion of three years work in the college and acceptance for further study in an accredited graduate school or in an approved medical or dental school.
Students who spend the senior year in absentia must fulfill the distribution requirements. In addition, the major department may require the comprehensive examination. Those who enter medical or dental schools are normally awarded the degree for which they qualify upon completion of the first year's work.

Those considering the senior year in absentia should discuss the possibility with the Dean of the College and petition the Administrative Committee in writing for approval. It is unlikely that students who spend the junior year abroad will receive approval to spend the senior year in absentia.

Satisfactory-Fail Option

For courses outside the area of concentration and for courses which do not fulfill degree requirements, students may elect to receive a grade of Satisfactory (S) or Fail (F) in one course a semester to a maximum of eight courses. Satisfactory (S) includes all grades "A" through "D." Under this option, grades are not figured into the cumulative average. This option should be declared in the College office at the beginning of the fourth week of the semester and once declared may not be changed. Instructors turn in regular letter grades for all students; they are not routinely informed which students elect this option. The Registrar records only an (S) or (F) keeping the letter grades "A" through "D" on file in the event of a change of major.
Courses of Instruction
in The College of Arts and Science
Aerospace Studies is a two-year Professional Officer Education Program available to students with two academic years remaining in either undergraduate or graduate status. The requirements for entering this program are discussed under the Air Force Professional Officer Course on page 213.

The four 200 level courses listed below must be successfully completed to qualify for a commission as a second lieutenant in the United States Air Force upon graduation.

"At the center of the Aerospace Studies curriculum is "Dialogue," the principle of instruction which imposes upon the student the responsibility of being chief agent for his quest for knowledge. Each student is helped to develop the ability to: define a problem, accumulate information, identify resources, conduct an inner-dialogue, formulate a plan, participate in inter-dialogue, make a decision, recommend action, and take responsibility for that action. This principle is applied to a variety of the standard teaching methods. Course enrollment will be controlled to provide for seminar-size sections of 12 to 17 students.

93. Air Operations. A student pilot ground school course of approximately 30 hours. The Sanderson Films, Inc. records and film strips are employed in this course, which includes: Pre-Flight Facts, Meteorology, Navigation, Radio Navigation, Flight Computer, and Federal Aviation Regulations. (A senior fall course) Open to a limited number of non-ROTC students.

201. Growth and Development of Aerospace Power. Throughout this and subsequent Aerospace Studies courses, the cadet should develop the abilities to observe and listen effectively, and to speak and write with accuracy, clarity, and appropriate style. The course of study includes: (1) the importance of the national space effort and how the space program evolved, (2) the main characteristics of the solar system that affect space explorations and operations, (3) the types of orbits and trajectories, including the principles and problems affecting their use, (4) the operating principles, characteristics, and problems associated with the components of space vehicle systems, and (5) the current and planned capabilities for space operations. (A spring course, three academic hours per week.)

202. Military History and Aerospace Power. A continuation of the development of the abilities to observe and listen effectively, and to speak and write with accuracy, clarity, and appropriate style. The course of study includes: (1) the importance of the national space effort and how the space program evolved, (2) the main characteristics of the solar system that affect space explorations and operations, (3) the types of orbits and trajectories, including the principles and problems affecting their use, (4) the operating principles, characteristics, and problems associated with the components of space vehicle systems, and (5) the current and planned capabilities for space operations. (A spring course, three academic hours per week.)

211. The Professional Officer I. A study of professionalism; professional responsibilities; the military justice system and leadership theory. (A fall course, three academic hours per week.)

212. The Professional Officer II. A study of military management principles and functions; problem solving; and management tools, practices and controls. (A spring course, three academic hours per week.)

Corps Training. Cadets enrolled in the above courses will average an additional hour a week in Corps Training. Here they will sharpen their military appearance and habits and perform planning and organizational projects similar to those done by Air Force officers.
Anthropology

René Millon, PH.D. (Columbia)... Professor of Anthropology
Alfred Harris, PH.D. (Cambridge)... Associate Professor of Anthropology and Chairman of the Department
Robert S. Merrill, PH.D. (Chicago)... Associate Professor of Anthropology and Associate Chairman of the Department
Walter Hinchman Sangree, PH.D. (Chicago)... Associate Professor of Anthropology
Gerald Williams, PH.D. (Chicago)... Associate Professor of Anthropology
Edward E. Calnek, PH.D. (Chicago)... Assistant Professor of Anthropology
Christopher Day, PH.D. (Chicago)... Assistant Professor of Anthropology
Allan Hoben, PH.D. (California at Berkeley)... Assistant Professor of Anthropology
*Clara Millon, PH.D. (California at Berkeley)... Assistant Professor of Anthropology
Charles Morrison, PH.D. (Chicago)... Assistant Professor of Anthropology
*Part-time.

The Department of Anthropology offers work leading to a concentration for the B.A. degree.
A program of concentration for the B.A. degree will normally consist of six to eight courses taken in the Department of Anthropology beyond the introductory work.
A student, in addition, is expected to take additional courses to bring the total in his concentration to ten in the related fields of Biology, Economics, English, Fine Arts, Foreign Languages, History, Philosophy, Political Science, and Psychology.
The departmental adviser should be consulted to determine in each student's case what courses in the department will be required for fulfillment of the concentration requirement and to select the field outside of the department which will support and enhance his work in the department.

101. Introduction to Anthropology. The nature and development of culture; social and cultural patterns; social and cultural universals and diversities; the individual and society.

201. The Development of Man, Culture and Society. Evolution of man and development of culture and society from earliest Pleistocene remains to beginnings of civilization in the Near East; development of human skill; religion and art in the Upper Paleolithic; agricultural revolution; development of cities and civilization in Southern Mesopotamia; spread of man into the New World.

202. Early Civilizations of the Old World and the New. Comparative study of Mesopotamian, Egyptian, Indus, Chinese, Middle American and Central Andean civilizations; theoretical approaches to such studies, with special emphasis on the value and limitations for the study of ancient civilizations of comparative evidence from existing societies.

209. Selected Studies in Ethnography. Examination of some of the basic descriptive studies in ethnography with particular attention to demonstrating the relation between field work and the development of method and theory in social anthropology.


211. Systems of Kinship and Descent. The major elements of kinship and descent; critical examination of specific systems, and of different approaches to the study of them; the relations between kinship and descent and other aspects of social structure.

*Omitted 1968-69
212. **Habitat, Economy and Society.** Major types of ecological adaptation; modes of subsistence, land-use, and land-tenure; ecology in relation to economic organization; ecological problems viewed as socially and culturally defined.

213. **Pre-Industrial Economic Systems.** An examination of exchange systems in selected non-European societies. Omitted 1968-69

214. **Comparative Religious Systems.** Ritual practices and related beliefs of selected societies. Associated phenomena of magic, mythology and witchcraft. Examination of outstanding theoretical approaches.

215. **Comparative Political and Legal Systems.** An analysis of the mechanisms for sanctioning and arbitrating social behavior in selected non-European cultures.

241. **Indians of North America.** A survey of the cultures of the aboriginal peoples in America north of Mexico. Culture area concept and its applications; major types of social structure and their variations; historical problems. Omitted 1968-69

242. **The Civilizations of Aboriginal Middle America.** Growth of aboriginal civilization in Middle America from the earliest time to the Spanish Conquest; Olmec, Zapotec, Maya, Teotihuacan, Toltec, Mixtec, Veracruz and Aztec civilizations; problem of relationship with the Old World, evaluations and comparisons; Indian Mexico since the Conquest.

246. **Peoples of Africa I.** Major culture areas of Negro Africa; detailed ethnographic studies; nature and diversity of indigenous social structure.

247. **Peoples of Africa II.** Selected problems in social anthropology and ethnography as they relate to the peoples of Africa or particular regions in Africa. Omitted 1968-69

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

261. **Cultural and Social Change.** Problems of cultural diffusion; analysis of types of culture contact and cultural interchange; the nativistic movement; the charismatic leader and the legitimation of authority. Omitted 1968-69

265. **The Study of Complex Societies.** Problems and theoretical approaches in the study of complex societies and civilizations; emphasis is on contemporary pre-industrial societies, and on selected ancient civilizations.

271. **Language and Culture.** The roles of linguistics in anthropology. Language differences and cultural differences. Language in society; the reflection of social organization in the formal aspects of verbal behavior. Anthropology 101 or Linguistics 205 prerequisite. Omitted 1968-69

291. **Readings in Anthropology.**

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

314. **Mythology and Religion.** Reading of selected mythologies of Oceania, Africa, and the Americas, and of related materials on rituals; consideration of anthropological contributions to the comparative study of myth and ritual, including the works of Malinowski, E. R. Leach, Levi-Strauss, Kluckhohn, A. F. C. Wallace and others.

349. **Studies in Indian Civilization.** Emphasis on interrelationships between Indians and Europeans as expressed in literary texts. Various Indian traditions examined in historical context. Omitted 1968-69

368. **Problems in Social Anthropological Analysis.** Consideration of current approaches to problems in social anthropology. Particular emphasis is placed on methodological and theoretical questions and on assessment of recent progress and possible lines of new development. Omitted 1968-69

416. **Anthropological Linguistics I.** Training in linguistic analysis as applied to the description of the second systems of language, with particular emphasis on the uses of such analysis in anthropological field work.

417. **Anthropological Linguistics II.** Training in linguistic analysis as applied to the description of grammatical systems, with special stress on anthropological field work.
Astronomy (see page 122)

Biology

Ernst Wolfgang Caspari, PH.D. (Göttingen) ... Professor of Biology
Johannes Friedrich Karl Holtfreter, PH.D. (Freiburg, Germany) ... Tracy H. Harris Professor of Zoology
Wolf Vishniac, PH.D. (Stanford) ... Professor of Biology and Chairman of the Department
Thomas T. Bannister, PH.D. (Illinois) ... Associate Professor of Biology, Radiation Biology, and Biophysics
Jerram L. Brown, PH.D. (California) ... Associate Professor of Biology and Associate Professor in the Center for Brain Research
Walter P. Hempfling, PH.D. (Yale) ... Associate Professor of Biology
George E. Hoch, PH.D. (Wisconsin) ... Associate Professor of Biology
Conrad Alan Istock, PH.D. (Michigan) ... Associate Professor of Biology
Jerome Sidney Kaye, PH.D. (Columbia) ... Associate Professor of Biology
William B. Muchmore, PH.D. (Washington) ... Associate Professor of Biology
Uzi Nur, PH.D. (California) ... Associate Professor of Biology
*Babette Brown Coleman, PH.D. (Cornell) ... Associate Professor of Biology and Research Associate in Biology
*James Charles Peskin, PH.D. (Columbia) ... Associate Professor of Biology and Optics
Stanley Hattman, PH.D. (Massachusetts Institute of Technology) ... Assistant Professor of Biology
Jakov Krivshenko, D.Sc. (Ukraine) ... Senior Research Associate in Biology
A. D. Agate, PH.D. (Bangalore) ... Research Associate in Biology
Eva M. Eicher, PH.D. (Rochester) ... Research Associate in Biology
Roy C. Hostetter, PH.D. (Illinois) ... Research Associate in Biology
*Rachel McMaster Kaye, PH.D. (Columbia) ... Research Associate in Biology
Doris Zallen, PH.D. (Harvard) ... Research Fellow in Biology
J. P. T. Pearman, M.A. (Cambridge) ... Assistant Chairman and Technical Associate

*Part-time

The Department of Biology offers courses of study leading to the B.A., B.A. with Honors, M.S., and Ph.D. degrees. It also offers, jointly with the Geological Sciences Department, a program leading to a B.S.-M.S. degree (five-year program) in Biology and Geology (Page 90).

Biology 110 is a prerequisite for all advanced courses except Biology 135.

B.A. Program

Professional work in Biology requires advanced training in graduate school. The departmental program for Biology majors is primarily a preparation for graduate school and seeks to acquaint the student with contemporary trends in the development of the biological sciences.
Students planning to concentrate in Biology should take a minimum of ten semester courses in biology and allied fields that are more advanced than Biology 110 and introductory courses in other subjects. Six of these advanced courses will normally comprise biological subjects and should include two that deal with systematic aspects (e.g. Biology 122, 125, 131, 132, 272); the remainder may be chosen freely from among the other advanced courses in Biology. Programs should, in all cases, be planned in consultation with the departmental advisers.

Recent developments in Biology lay increasing emphasis on its quantitative aspects and these cannot be treated satisfactorily except in terms of the laws that describe the properties of all matter and energy. The Department, therefore, requires all Biology majors to take the following courses in allied fields:

- Chemisty 121 and 122, or 123 and 124
- Chemisty 161 and 162, or 163 and 164
- Physics 101 and 102
- Mathematics 161 and 162
- Two additional courses chosen from: Mathematics 163, 164, Statistics 110 and a course in computing, e.g. Quantitative Methods (QNT) 235. It is recommended that students also take Chemistry 152 or 251 and 252.

In fulfilling the University language requirement, the Department strongly recommends that the student acquire a reading knowledge of one of the following modern languages: French, German or Russian.

Courses offered in the Department are primarily for students intending to specialize in biology and for those whose courses of study require instruction in biological subjects. The Department is not always able to offer a sufficient number of elementary courses to guarantee that students will be able to meet their science distribution requirements with courses in biology.

Students should verify the course offerings before planning their programs.

Honors Program in Biology

Students who have demonstrated to the department's satisfaction a high level of competence may, at the end of the sophomore year, elect Honors in Biology. A faculty member must be willing to guide the student in his Honors work during his junior and senior years. The Honors work will consist of the following:

- Biology 391, Honors Readings in Biology, will be taken in the first semester of the junior year. The purpose of this course is to prepare the student for a specific piece of research. Additional readings in Biology 391 are optional in the second semester of the junior year.

- Biology 393, Honors Problems in Biology, will be taken in each semester of the senior year, but may be taken as early as the second semester of the junior year.

- During his senior year the student will take Biology 385, Honors Seminar in Biology, to afford him an opportunity to discuss his work with other Honors students and to discuss with staff members current research in Biology.

- At the end of the senior year the student will prepare a paper describing his research and will defend it in an oral examination before an outside examiner. Upon successful completion of the Honors Program the student will be awarded a B.A. in Biology with Honors.

101. General Biology. Introductory course for students wishing to include Biology in their program of studies but not intending to take advanced courses in it. Principles of modern biology: cellular and molecular biology, organismic biology, genetics, evolution and ecology. Prerequisite: at least one course in high school or college chemistry. Three lectures a week, no lab.

110. Introduction to Modern Biology. A rigorous introductory course for students expecting to major in Biology and a prerequisite to all advanced courses. Covers the same topics as Biology 101 but in greater depth: The laboratory acquaints the student with the practical methods that constitute the experimental basis of biology. Prerequisites: Chemistry 121 and 122 or 123 and 124 (122 or 124 may be taken concurrently). Three lectures and one three-hour lab a week.

122. Invertebrate Zoology. Anatomy, physiology, behavior, life histories and evolution of animals constituting the principal groups of invertebrates. Biology 110 prerequisite. Three lectures and one three-hour lab a week. (Omitted 1968-69)

125. Structure and Function of Vertebrates. Structural changes in the line of descent leading from primitive jawless fish to modern mammals. Background for the understanding of human anatomy. The structure of fossil vertebrates and the development and structure of modern chordates are dealt with by laboratory observation, dissection or lecture. Biology 110 prerequisite. Three lectures and one three-hour lab a week.

131. The Plant Kingdom. General biology of plants. 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 110 prerequisite. Three lectures or conferences, one three-hour lab or field trip a week.
132. Biology of Flowering Plants. 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 110 prerequisite. Three lectures or conferences, one three-hour lab or field trip a week.


220. Cytology. Introduction to the study of cells. Topics include: the morphology and chemistry of chromosomes, mitochondria, the Golgi apparatus, centrioles, and the endoplasm. Prerequisites: Biology 110, Chemistry 122, Chemistry 261 and 162 or 163 and 164. Three lectures or demonstrations, one three-hour lab a week.

221. Genetics. Genes and cytoplasmic factors as the units of heredity; a general introduction to modern genetics including its molecular basis and its morphogenetic and evolutionary implications. Prerequisites: Biology 110, Chemistry 161 and 162 or 163 and 164. Two or three hours, one demonstration-discussion section a week.

222. Evolution. The evidence for organic evolution and the principles governing the evolution of plants and animals. Biology 110 and 221 prerequisite. Three lectures a week, no lab.

241. Animal Development. 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 110 and 122 or 123 prerequisite. Three lectures and two three-hour labs a week.

260. Animal Behavior. The comparative study of behavior, with interpretation of species differences in terms of contemporary evolutionary and ecological theory. Emphasis is placed on animal communication and social organization in natural populations. Prerequisite: Biology 110. Recommended: Biology 261 or 222, and 122 or 125. Three lectures a week, no lab.

261. Ecology. An introduction to the factual material, theoretical considerations and methods involved in current studies of plant and animal associations. Field and laboratory work. Each student carries out an independent field investigation and submits a written analysis of his work. Prerequisite: Biology 110. Three lectures, one three-hour lab a week.

265. Biochemistry-Cellular Physiology Laboratory. Laboratory exercises will deal with fundamental biochemical and cell physiological subjects and procedures. While exercises in a variety of topics will be recommended, projects of particular interest to students may be chosen for extended investigation. Primary goal will be achievement of real competence in experimental work—especially in design, quantitative measurement, analysis of data, and error analysis. Prerequisites: Biology 110, and prior or concurrent registration in Biology 275-475. One four-hour lab a week.

272. General Microbiology. Survey of microorganisms. Structure and function of bacteria, protozoa, fungi and algae, and the associated evolutionary trends. Topics considered: growth curves and their interpretation, life cycle, relationship of microorganisms to other organisms. Prerequisite: Biology 110. Two hour-and-a-half lectures, one three-hour lab a week.

275. Biochemistry and Cellular Physiology. A lecture course devoted three quarters to biochemistry and about one quarter to cellular physiology. Topics include: chemical constituents of living matter, their structure, properties, synthesis and degradation, electron transport and energy metabolism, regulation of metabolism, osmotic and transport phenomena of cells. Prerequisites: Biology 110, and one year each of organic chemistry, calculus and physics. Three lectures a week, no lab.

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 110 prerequisite. Registration upon approval of departmental adviser.

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 110 prerequisite. Registration upon approval of departmental adviser.

385. Honors Seminar. A required course for all honors students in Biology. Discussion of their own research and a consideration of important problems in modern biology. Open to qualified seniors by permission. Three hours a week.

391. Honors Readings in Biology. Similar to 291, but for students enrolled in the Honors Program.

393. Honors Problems in Biology. Similar to 293, but for students enrolled in the Honors Program.

COURSES OFFERED IN THE SCHOOL OF MEDICINE, with approval for college credit in the cases of undergraduates other than Biology concentrators and pre-medical students.

317. 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 and Chemistry 121 and 122 or 123 and 124 prerequisite. Lectures, two three-hour labs a week.
Center for Brain Research

Leo Abood, Ph.D. (Chicago) . . . Professor in the Center for Brain Research
Robert Doty, Ph.D. (Chicago) . . . Professor in the Center for Brain Research
Karl Knigge, Ph.D. (Michigan) . . . Professor of Anatomy and Professor in the Center for Brain Research
Karl Lowy, M.D. (Vienna) . . . Professor in the Center for Brain Research and Psychology
Jerome Schwartzbaum, Ph.D. (Stanford) . . . Professor of Psychology and Professor in the Center for Brain Research
Ray S. Snider, Ph.D. (Washington University) . . . Professor in the Center for Brain Research and Director of the Center
Garth J. Thomas, Ph.D. (Harvard) . . . Professor in the Center for Brain Research
Bernard Weiss, Ph.D. (Rochester) . . . Professor of Radiation Biology and Professor in the Center for Brain Research
Jerram L. Brown, Ph.D. (California) . . . Associate Professor of Biology and Associate Professor in the Center for Brain Research
Keith Bignall, Ph.D. (Michigan) . . . Assistant Professor of Physiology and Assistant Professor in the Center for Brain Research
David Goldblatt, M.D. (Western Reserve) . . . Assistant Professor of Neurology and Assistant Professor in the Center for Brain Research
Ryo Tanaka, M.D., Ph.D. (Tokyo) . . . Assistant Professor in the Center for Brain Research
John F. Bartlett, Ph.D. (McMaster) . . . Research Associate in the Center for Brain Research
Manuel Perez del Cerro, M.D. (Buenos Aires) . . . Research Associate in the Center for Brain Research
Akira Matsubara, D. Sc. (Kyushu) . . . Research Associate in the Center for Brain Research
Henry Sarau, Ph.D. (Illinois) . . . Research Associate in the Center for Brain Research
Abraham Sudilovsky, M.D. (Buenos Aires) . . . Research Associate in the Center for Brain Research
Jack Culbertson, Ph.D. (Brown) . . . Postdoctoral Fellow in the Center for Brain Research
Robert B. Glassman, Ph.D. (Pennsylvania) . . . Postdoctoral Fellow in the Center for Brain Research
Gayle Hostetter, Ph.D. (Illinois) . . . Postdoctoral Fellow in the Center for Brain Research
Eleanor E. Hurlbrink, Ph.D. (Rochester) . . . Postdoctoral Fellow in the Center for Brain Research
Nubio Negrao, M.D. (São Paulo) . . . Postdoctoral Fellow in the Center for Brain Research

The Center for Brain Research, jointly sponsored by the College of Arts and Science, the College of Engineering and Applied Science and the School of Medicine and Dentistry, is concerned with education at the Ph.D. level and with research in problems of the nervous system. Undergraduates with special permission may take special research or reading courses offered by the Center.

291. Reading Course in Neuroscience. A special program in advanced topics may be arranged according to the needs and interests of individual students. Permission of the instructor required.

293. Special Problems in Neuroscience. The investigation of a special problem involving laboratory research and library use, and presentation of the results. Permission of the instructor required.
Chemistry

Jacob Bigeleisen, Ph.D. (Berkeley)... Professor of Chemistry
Frank Paul Buff, Ph.D. (California Institute of Technology)... Professor of Chemistry
Albert Benjamin Ford Duncan, Ph.D. (Johns Hopkins)... Professor of Chemistry
Marshall DeMott Gates, Jr., Ph.D. (Harvard)... Charles Frederick Houghton Professor of Chemistry
John R. Huizenga, Ph.D. (Illinois)... Professor of Chemistry
Andrew S. Kende, Ph.D. (Harvard)... Professor of Chemistry
William Hundley Saunders, Jr., Ph.D. (Northwestern)... Professor of Chemistry and Chairman of the Department
David Wilson, Ph.D. (California Institute of Technology)... Professor of Chemistry
Marshall Blann, Ph.D. (California)... Associate Professor of Chemistry
Jack Kampmeier, Ph.D. (Illinois)... Associate Professor of Chemistry
Henry M. Sobell, M.D. (Virginia)... Associate Professor of Chemistry
Lawrence David Colebrook, Ph.D. (Auckland)... Assistant Professor of Chemistry
Louis E. Friedrich, Ph.D. (Berkeley)... Assistant Professor of Chemistry
Kenneth G. Harbison, Ph.D. (Massachusetts Institute of Technology)... Assistant Professor of Chemistry
Robert W. Kreilick, Ph.D. (Washington University, St. Louis)... Assistant Professor of Chemistry
Keiji Morokuma, Ph.D. (Kyoto University)... Assistant Professor of Chemistry
George C. Nieman, Ph.D. (California Institute of Technology)... Assistant Professor of Chemistry
Francis R. Nordmeyer, Ph.D. (Stanford)... Assistant Professor of Chemistry
Richard H. Schlessinger, Ph.D. (Ohio State)... Assistant Professor of Chemistry
James Aspden, Ph.D. (University College, London)... Postdoctoral Fellow in Chemistry
Aziz Behkami, Ph.D. (Northwestern)... Postdoctoral Fellow in Chemistry
Keith Brown, B.Sc. (University of Liverpool)... Postdoctoral Fellow in Chemistry
Charles S. Burton, Ph.D. (Texas)... Postdoctoral Fellow in Chemistry
Gilbert DeBoer, Ph.D. (California Institute of Technology)... Postdoctoral Fellow in Chemistry
Thomas Elze, Ph.D. (University of Munich, Germany)... Postdoctoral Fellow in Chemistry
Paul Endres, Ph.D. (Rochester)... Postdoctoral Fellow in Chemistry
Donald Fleming, Ph.D. (Berkeley)... Postdoctoral Fellow in Chemistry
Tzu F. Lin, Ph.D. (Oklahoma)... Postdoctoral Fellow in Chemistry
Fernando Mazza, Ph.D. (University of Rome)... Postdoctoral Fellow in Chemistry
T. D. Sakore, Ph.D. (Indian Institute of Technology, Bombay)... Postdoctoral Fellow in Chemistry
B. Sugavanam, Ph.D. (Indian Institute of Science)... Postdoctoral Fellow in Chemistry
S. S. Tavale, Ph.D. (Poona University, India)... Postdoctoral Fellow in Chemistry
Kumiko Toriyama, Ph.D. (Osaka University, Japan)... Postdoctoral Fellow in Chemistry
C. T. VonEgidy, Ph.D. (University of Munich, Germany)... Postdoctoral Fellow in Chemistry
Ethel Louetta French, Ph.D. (Rochester)... Professor Emeritus of Chemistry
Ralph William Helmkamp, Ph.D. (Harvard)... Professor Emeritus of Chemistry
Willard Riggs Line, Ph.D. (Columbia)... Professor Emeritus of Chemistry
W. Albert Noyes, Jr., D-ES-SC (D'ETAT), S.C.D. (Paris)... Distinguished Senior Professor Emeritus of Chemistry
Edwin Odde Wiig, Ph.D. (Wisconsin)... Professor Emeritus of Chemistry
The Department of Chemistry offers work leading to a concentration in Chemistry for the B.A. or B.S. degree and to the M.S. and Ph.D. degrees. Training at the post-doctoral level is also offered.

Two introductory courses are offered. Chemistry 123 and 124 are designed specifically for majors in Chemistry (both B.A. and B.S.), Chemical Engineering, Physics, and Biology. Students planning to take Chemistry 123 and 124 should present secondary school Chemistry for admission. A few other students may be admitted to this course provided their records warrant it. Chemistry 121 and 122, which do not have secondary school Chemistry as a prerequisite, are taken by concentrators and majors other than those mentioned above, either for the purpose of satisfying professional requirements or of meeting the science distribution requirement. Students who wish to major in Chemistry after taking Chemistry 121 and 122 may do so upon obtaining departmental approval. To fulfill departmental requirements for the B.A. or B.S. degree in Chemistry, courses in Chemistry must be taken in the College of Arts and Science of the University unless prior approval has been obtained from the department.

The undergraduate program in Chemistry allows opportunity for independent study, both for B.A. and B.S. candidates. Both Chemistry 415 and 435 are taught on an individual basis, with the students working on unknowns directly under the instructors in the course. All Chemistry majors take the Senior Seminar, which involves preparation and presentation of a topic from the original literature under the direction of one or more staff members. All of the B.S. candidates, and those B.A. candidates who wish to, take a senior research problem with a member of the staff, in which they carry out original work, with the opportunity of publishing this in a scientific journal if it is successful. In recent years a number of seniors have had publications from their research. Furthermore, some of the undergraduate majors are able to work during the summer on research problems with members of the staff, either as hired research assistants or as participants in the National Science Foundation Undergraduate Research Program.

B.A. Program

The minimum requirements for students concentrating in Chemistry for the B.A. degree are:

A. Chemistry 121 and 122 or 123 and 124
B. Chemistry 143 and 214 or Chemistry 213 and 214
C. Chemistry 161 and 162 or Chemistry 163 and 164
D. Chemistry 251 and 252
E. Chemistry 285 and 286

Chemistry 251 and 252 require as prerequisites one year of Physics, and Mathematics through differential and integral calculus with some differential equations. (This requirement is met by completion of Mathematics 164.) At least one year of Chemistry in addition to the senior seminar must be taken in the senior year. If the student wishes to meet requirements for membership in the American Chemical Society upon graduation, he should take, in addition to minimum requirements, an advanced lecture course, an advanced laboratory course, and German.

Additional courses in Physics and Mathematics and courses in other sciences, such as Biology, Geology, etc. may be taken as part of the concentration program. Students are urged to elect German to satisfy the foreign language requirement.

B.S. Program

This program is designed to give the student the training deemed essential to qualify as a professional chemist or to give him a thorough preparation for graduate work in Chemistry; students wishing to do graduate work in Biochemistry may major in Chemistry with electives in Biology. A reading knowledge of technical German is required (German 105 or 103). It is advantageous to present two years of preparatory school German for admission since this allows the student two additional electives. The synopsis of this curriculum follows:
FIRST YEAR
2. English Requirement
3. Math. 161 Analysis I
4. Phys. 115 Physics I
   Phys. 117 Physics IA
   Physical Education

SECOND YEAR
1. Chem. 163 Organic Chemistry
2. Foreign Language (Group I)*
3. Math. 163 Analysis III
4. Phys. 125 Physics II
   Phys. 127 Physics IIA
   Physical Education

THIRD YEAR
1. Chem. 213 Quantitative Analysis I
2. Chem. 251 Physical Chemistry I
3. Group I
4. Group II

FOURTH YEAR*
1. Chem. (431, 451)**
2. Chem. 415 or 435
3. Group II
4. Elective
5. Elective
   Chem. 285 Senior Seminar

2. Group I
3. Math. 162 Analysis II
4. Phys. 116 Physics I
   Phys. 118 Physics IA
   Physical Education

1. Chem. 164 Organic Chemistry
2. Germ. 105 Special Technical Readings** or
   Germ. 103 Intermediate German**
3. Math. 164 Analysis IV
4. Phys. 125 Physics II
   Phys. 128 Physics IIA
   Physical Education

1. Chem. 214 Quantitative Analysis II
2. Chem. 252 Physical Chemistry II
3. Elective
4. Group II

1. Chem. 295 Thesis Research
2. Chem. 296 Thesis Research
3. Chem. (412, 432 or 452)**
4. Elective
5. Elective
   Chem. 286 Senior Seminar

*Most students can complete their requirement in foreign languages with one term of college work. Those who need more than one term must take the necessary courses as electives.

**Prerequisite: German 101 and 102 or equivalent.

*The choice of courses required in the senior year will be determined by the department counsellor. A student who is not taking Chemistry 435 may register for Chemistry 295 during the first semester if approval is obtained from the thesis adviser or department counsellor before the end of the junior year.

**Courses in Biology, Mathematics or Physics approved by the Department of Chemistry may be substituted.

*Two of these courses must be elected during the senior year.

*Students who intend doing graduate work in Physical Chemistry should make every effort to include additional work in mathematics and physics.
121. General Chemistry I. Fundamental principles of chemical science and the chemistry of several important metals and non-metals and their compounds. This course, less advanced than Chemistry 123, is primarily intended for premedical students and others who may plan to follow with Chemistry 142 and 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.—Two lectures, two recitations, one lab a week.

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

123. General Inorganic Chemistry. A more advanced course than Chemistry 121, designed primarily for students majoring in Chemistry, Chemical Engineering and Physics. General principles underlying chemistry and some of the important non-metals and their compounds. Upon recommendation of the department, students may be transferred to Chemistry 121 during the semester. Entrance Chemistry prerequisite.—Two lectures, two recitations, two labs a week.

124. General Inorganic Chemistry and Qualitative Analysis. A continuation of Chemistry 123. The chemistry of the metals and their compounds, atomic structure, nuclear and artificial radioactivity and the principles underlying qualitative analysis. 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.—Two lectures, two recitations, two labs a week.

143. 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.—Two lectures, two labs a week.

152. Chemical Principles. Introduction to thermodynamics, equilibria, elementary chemical kinetics, electrochemistry, colloid and surface chemistry, molecular structure. Prerequisites: one year of calculus and Chemistry 143. May not be taken for credit by Chemistry majors.

161. Organic Chemistry I. 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.—Three lectures, two labs a week.

162. Organic Chemistry IA. Continuation of Chemistry 161.

163. Organic Chemistry II. An introduction to the structural theory of organic chemistry and the important types of organic reactions with special emphasis
on reaction mechanisms and the dependence of reactivity on structure. Laboratory work will include modern techniques, representative syntheses, and an extended introduction to qualitative organic analysis. Required for the B.S. in Chemistry, recommended for the B.A. in Chemistry. Prerequisite: Chemistry 121 and 122, or 123 and 124.—Three lectures, two labs a week.

164. Organic Chemistry IIIA. Continuation of Chemistry 163.

213. Quantitative Analysis I. Designed primarily for chemists and chemical engineers. The theories, fundamental principles and stoichiometry of quantitative analysis, and the technique of quantitative methods are developed and applied. More rigorous and exacting than Chemistry 143. Chemistry 123, 124, and 161, 162 prerequisite. May not be taken for graduate credit.—Two lectures, two labs a week.

214. Quantitative Analysis II. Continuation of Quantitative Analysis I. A more comprehensive study of the principles of the science. Some of the laboratory work involves the quantitative separation and determination of components in materials of industrial importance. Electrochemical, colorimetric, and other photometric methods. May not be taken for graduate credit. Chemistry 213 or consent of instructor prerequisite.—Two lectures, two labs a week.

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 101 and 102 or 125 and 126 or 127 and 128; Mathematics 163, 164.—Three lectures, one lab a week.

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.—Three lectures, one lab a week.

285. Senior Seminar I. 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.
No credit. One lecture a week.

286. Senior Seminar II. Continuation of Chemistry 285.

*291. Senior Reading Course in Chemistry I. Students majoring in chemistry, who are unable to register for other regularly scheduled advanced courses, may register for this course with special permission of the department.—Three lectures a week.

292. Senior Reading Course in Chemistry II. Continuation of Chemistry 291.

295. Senior Thesis Research I. Each student selects a thesis topic, the investigation of which will teach him how to attack a problem involving laboratory and library work. This project affords an opportunity for independent reading and research. A written thesis presenting the results and analyzing their significance in a critical manner is required. Chemistry 415 or 435 prerequisite.

296. Senior Thesis Research II. Continuation of 295.

*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—four hours. Three lectures a week.

*415. Advanced Analytical Laboratory. Recently developed analytical procedures, colorimetry, spectrophotometry, spectroscopy, electrical methods, and other physical-chemical methods of analysis. The lectures, credit one hour, may be taken by graduate students who are not registered for the laboratory.—Credit—two hours. One lecture, one lab a week.

*431. Advanced Organic Chemistry I. Stereochemistry and conformational analysis, followed by detailed consideration of some important synthetic methods.—Three lectures a week.

*432. Advanced Organic Chemistry II. Bonding in organic molecules, atomic and molecular orbitals including Hückel MO calculations, kinetics and mechanisms of organic reactions.—Three lectures a week.

*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.—One lecture, two labs a week.

*451. Advanced Physical Chemistry I. Thermodynamics and quantum mechanics.—Three lectures a week.

*452. Advanced Physical Chemistry II. Spectroscopy, statistical mechanics, chemical kinetics, nuclear processes, molecular structure.—Three lectures a week.

*453. Mathematics of Physical Chemistry. Aspects of mathematics of particular utility to those working in physical chemistry will be discussed. Topics to be introduced include vector and matrix analysis, differential equations, the calculus of variations, and group theory.—Three lectures a week.

For Industrial Chemistry and other courses in Chemical Engineering see pages 182-183.

*Token with consent of the instructor.
Committee on East Asian Studies

Robert W. Compton, M.A. (Stanford)... Assistant Professor of Chinese Literature
Ralph C. Croizier, Ph.D. (Berkeley)... Assistant Professor of History
*Vinjamuri Devadutt, Th.D. (Toronto)... Professor of Religion
Diran Dohanian, Ph.D. (Harvard)... Associate Professor of Fine Arts
*Henry P. French, M.A. (Rochester)... Instructor in College of Education
Robert B. Hall, Jr., Ph.D. (Michigan)... Professor of History and Geography and Director of the Center
Harry D. Harootunian, Ph.D. (Michigan)... Professor of History
Chung-Kai Huang, A.M.L.S. (Michigan)... East Asian Librarian
Akira Iriye, Ph.D. (Harvard)... Associate Professor of History
Seung-Yil Kwon, A.M.L.S. (Syracuse)... East Asian Assistant Librarian
Edward M. Quackenbush, M.A. (Michigan)... Assistant Professor of Japanese Language
William F. Sibley, M.A. (Harvard)... Assistant Professor of Japanese Literature
Charles J. Wivell, B.A. (Washington)... Assistant Professor of Chinese Literature
Caroline H. Wood, B.A. (Tsing Hua, Peking)... Instructor in Chinese

*Part-time

The East Asian Language and Area Center, established in 1967 at the University of Rochester, and assisted by the United States Office of Education through provisions of the National Defense Education Act, is designed to permit students concentrating in the social sciences and humanities to develop knowledge of East Asian cultures and languages as a complement to their disciplinary concentration. A student selecting this program will, in addition to fulfilling the requirements of his department, arrange the following special program which will be drawn from his electives.

1. Basic course in East Asian history.
2. Two years of either Chinese or Japanese language.
3. Four courses from those listed below.

Upon graduation the student will receive a certificate in East Asian studies as well as a B.A. in his department of concentration.

Students planning to take work in the East Asian Studies program should consult with Mr. Croizier or Mr. Hall.

Departmental offerings acceptable in the program are: Fine Arts 190, 226; Foreign and Comparative Literature—Chinese 251, 261, 284, 285, 287, 291, 295, 491; Japanese 291; History 281, 282, 283, 286, 287, 388; Languages and Linguistics—Chinese 201, 202, 203, 205, 221, 222; Japanese 201, 202, 203; History of Religion 103. (See departmental headings for course description.)
Economics

Emmanuel Drandakis, Ph.D. (Rochester) ... Professor of Economics
Robert W. Fogel, Ph.D. (Johns Hopkins) ... Professor of Economics
Robert R. France, Ph.D. (Princeton)... Professor of Economics
Ronald Winthrop Jones, Ph.D. (Massachusetts Institute of Technology)... John Munro Professor of Economics
Norman Kaplan, M.A. (Chicago)... Xerox Professor of International Economics
Lionel Wilfred McKenzie, Ph.D. (Princeton)... Wilson Professor of Economics
Hugh Rose, M.A. (Oxford)... Professor of Economics
Richard N. Rosett, Ph.D. (Yale)... Professor of Economics and Chairman of the Department
Sho-Chieh Tsiang, Ph.D. (London)... Professor of Economics
W. Allen Wallis, A.B. (Minnesota)... Professor of Economics and Statistics
Edward Zabel, Ph.D. (Princeton)... Professor of Economics
Stanley Engerman, Ph.D. (Johns Hopkins)... Associate Professor of Economics and Director of Undergraduate Studies
James W. Friedman, Ph.D. (Yale)... Associate Professor of Economics
G. S. Maddala, Ph.D. (Chicago)... Associate Professor of Economics
Rudolph Penner, Ph.D. (Johns Hopkins)... Associate Professor of Economics and Director of Graduate Studies
Sherwin H. Rosen, Ph.D. (Chicago)... Associate Professor of Economics
Roth Clausing, Ph.D. (Columbia)... Professor Emeritus of Economics
William Edward Dunkman, Ph.D. (Columbia)... Professor Emeritus of Economics

The Department of Economics offers a program of study for Bachelor of Arts candidates and, at the graduate level, for the Master of Arts and Doctor of Philosophy degrees.

Economics 101 is a prerequisite for all other courses in economics except with special permission of the Department. Students who plan to concentrate in economics will be expected to have completed the prerequisite work specified by the Department with grades of "C" or better. Students majoring in economics are required to present two courses of mathematics, Mathematics 101 and either Mathematics 100 or 161; these will normally be taken during the first two years.

Departmental requirements for concentration include Economics 207, 209, 231, and 285. Six additional courses will be required, of which at least two and at most four will be economics courses, the remainder being related courses in other departments. The courses taken in departments other than the Economics Department must be related to economics courses in the concentrator's program and to one another so as to contribute substantially to the program. These related courses must be selected in consultation with the Director of Undergraduate Studies.

Honors degrees: Certain undergraduate courses in the Economics Department are designated as seminars and require the student to undertake a research project and to write a paper based on his research. A concentrator may earn a degree with honors by performing unusually well in four such courses and by displaying a high level of preparation in an oral examination to be administered at the end of his senior year. An honors candidate may substitute for two of these seminars courses at the 400 level or research projects conducted under the supervision of members of the Department.
101. Principles of Economics. Following an introduction to economic theory, a significant economic policy question will be analyzed by application of the theory. This course will meet twice weekly in a large lecture hall and once each week in a discussion section of not more than 15 students.

201. Seminar in the History of Economic Doctrine. The bulk of the material from the 18th and 19th centuries; considerable emphasis placed on Adam Smith and the classical school and on Marx and other Marxians, together with historical application to social and economic policy.

207. Intermediate Economic Theory. An analysis of economic equilibrium under conditions of free competition and various degrees of monopoly control. Attention also is given to the theory of distribution of wages, rent, interest, and profits.

209. National Income Analysis. National income accounting concepts are discussed as measures of social welfare, and as quantities whose changes and fluctuations can be explained by theories of income determination and business cycles.

211. Money, Credit, and Banking. 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. Prerequisite: Economics 209.

213. Monetary and Central Banking Policy. An intensive study of Federal Reserve policies against the background of monetary theory. Interrelations of fiscal and monetary policies are analyzed theoretically and empirically. International as well as national effects of monetary policy are considered. Major emphasis is placed upon post-World War II problems. Prerequisite: Economics 211.

223. Labor Problems. Analysis of wages and other conditions of employment in an industrial society. Emphasis is placed on the impact of unions on workers, management and the public. Consideration is given to economic factors and other issues involved, including labor legislation. Prerequisite: Economics 207.


227. Seminar in American Economic Growth. Analysis of the main features of American economic growth since 1800. Recent statistical studies of national product, industrial structure and capital formation are evaluated.

229. Monetary Theory. Functions and services of money; factors governing the demand for, and supply of, money and money substitutes; the relationships between money and levels of prices, employment, interest rates and the balance of payments; the effectiveness of monetary policy; and the coordination of monetary policy with debt management and fiscal policy. Prerequisite: Economics 209.

231. Economic Statistics. Regression analysis applied to time series and cross-section data to estimate economic relationships; also elementary exposition of the estimation of simultaneous equations and analysis of variance. Prerequisite: Mathematics 110.

235. Seminar in the Theory of Economic Growth. The theory of the growth of the economy as a whole. Three types of growth theory are considered: the Classical, the Neo-classical and the Keynesian, and the relationship between them is discussed. Their applicability is examined (a) to problems of the underdeveloped economy and development planning and (b) to problems of the advanced economy, with some reference to long-run employment and the business cycle. Prerequisite: Economics 209.


253. Seminar in the Canadian Economy. Development and structure of the expanding Canadian economy in terms of population growth, gross product and other basic characteristics. Critically important economic relations between the United States and Canada receive special attention.

263. Public Finance and Fiscal Policy. Economic criteria for judging government policies which alter the allocation of resources and the distribution of income. Government policies to stabilize prices, reduce unemployment, and foster economic growth. Special reference to United States' policies and problems. Prerequisite: Economics 207.


279. General Equilibrium Analysis. Exposition of traditional general equilibrium analysis with an introduction to welfare economics, input-output analysis, and activity analysis. Prerequisites: Economics 207, Mathematics 161, 162 (or equivalent mathematics courses as determined by the instructor).
285. Senior Seminar. Required of all seniors concentrating in economics. Students write essays which serve as a basis for discussion in seminar meetings. Two semesters of this course must be taken for one course credit.

291. Junior Reading Course. By arrangement with the department to permit work beyond regular course offerings.

292. Senior Reading Course. By arrangement with the department to permit work beyond regular course offerings.


471. Modern Value Theory I. A treatment of leading topics in value theory since 1870 with special attention to the writings of major economists, such as Marshall, Walras, Chamberlin, and Hicks. The approach is analytical, and subjects are developed to their present state in economic theory. Prerequisite: Economics 207.

472. Modern Value Theory II. Continuation of Economics 471. Prerequisite: 471.

481. Introduction to Mathematical Economics. Introduction to the use of modern algebra in economic theory and applied economics. Particular attention is given to linear programming and input-output analysis. Prerequisites: Mathematics 161, 162, Economics 207.

Rowland L. Collins, Ph.D. (Stanford) ... Professor of English
George H. Ford, Ph.D. (Yale) ... Joseph H. Gilmore Professor of English and Chairman of the Department
William H. Gilman, Ph.D. (Yale) ... Roswell S. Burrows Professor of English
Anthony Hecht, M.A. (Columbia) ... Deane Professor of Rhetoric and Poetry
Robert Benedict Hinman, Ph.D. (Johns Hopkins) ... Professor of English
Howard C. Horsford, Ph.D. (Princeton) ... Professor of English
Joseph H. Gilmore ... Professor of English and Chairman of the Department
William H. Gilman, Ph.D. (Yale) ... Roswell S. Burrows Professor of English
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Robert Benedict Hinman, Ph.D. (Johns Hopkins) ... Professor of English
Howard C. Horsford, Ph.D. (Princeton) ... Professor of English
D. J. Palmer, B.LITT. (Oxford) ... R. T. French Visiting Professor of English
Richard M. Collin, Ph.D. (Minnesota) ... Associate Professor of English
Sherman Hawkins, Ph.D. (Princeton) ... Associate Professor of English
Bruce Johnson, Ph.D. (Northwestern) ... Associate Professor of English
Jay A. Levine, Ph.D. (Johns Hopkins) ... Associate Professor of English
Paul Levine, Ph.D. (Harvard) ... Associate Professor of English
Russell A. Peck, Ph.D. (Indiana) ... Associate Professor of English
George Grella, Ph.D. (Kansas) ... Assistant Professor of English
Beth A. Casey, M.A. (Columbia) ... Assistant Professor of English
Robert Folkenflik, Ph.D. (Cornell) ... Assistant Professor of English
Stanley J. Kahrl, Ph.D. (Harvard) ... Assistant Professor of English
John R. Nabholtz, Ph.D. (Chicago) ... Assistant Professor of English and Assistant Chairman of the Department
Robert Parker, Ph.D. (Columbia) ... Assistant Professor of English
Jarold W. Ramsey, Ph.D. (Washington) ... Assistant Professor of English
Barry Westberg, Ph.D. (Cornell) ... Assistant Professor of English
Wystan Curnow, M.A. (Auckland) ... Instructor in English
Robert Foy, M.A. (Minnesota) ... Instructor in English
*Barbara Rubin, M.A. (Rochester) ... Instructor in English
Alarik Skarstrom, M.A. (Yale) ... Instructor in English
David Tarbet, M.A. (Rochester) ... Instructor in English
George Chester Curtiss, M.A. (Harvard) ... Professor Emeritus of Rhetoric and English Literature
Wilbur Dwight Dunkel, Ph.D. (Chicago) ... Professor Emeritus of English
Kathrine Koller, Ph.D. (Johns Hopkins) ... Professor Emeritus of English
*Part-time
Joint Appointments

McCrea Hazlett, Ph.D. (Chicago). . . Professor of English and Vice President of the University
Ralph James Kaufmann, Ph.D. (Princeton). . . Professor of History and English
Bernard Nicholas Schilling, Ph.D. (Yale). . . Trevor Professor of English and Comparative Literature
Lawrence Wm. Kuhl, Ph.D. (Western Reserve). . . Associate Professor of English and Associate Dean of the College
Lisa Rauschenbusch, A.M. (Cornell). . . Associate Professor of English and Advisor for Student Play Productions

The Department of English offers work leading to a concentration for the B.A. degree, for the B.A. degree in the Honors Program, and, at the graduate level, for the M.A. and Ph.D. degrees.

The Colleges of the River Campus require a course in English at the 100 level (excluding courses numbered 120-129); see statement of Degree Requirements in this Bulletin. Students wishing to take any English course numbered 200 or higher are to have completed the College requirement of one of the specified courses at the 100 level and also to have taken at least one additional course in English at the 100 level. These two courses are to be selected from the following: 102, 103, 105, 111, 130, 131, 132, 133, 141, 144, 190-199. For concentrators in English the additional requirements are listed below. Courses numbered between 120 and 129 may be taken as electives, but do not ordinarily count toward satisfaction of either general College distribution or departmental concentration requirements.

Courses numbered from 200-249 are customarily open to juniors and seniors and to qualified freshmen and sophomores. Courses numbered from 250-299 are customarily open to seniors and to qualified juniors; approval of the instructor may be required for enrollment.

Students planning to concentrate in English should plan their underclass program to include three courses at the 100 level, as follows: English 102 (Continental Masterpieces), English 144 (Shakespeare), and at least one of English 130, 131, 132, 133, 141 and 190-199. The Department strongly recommends that these courses be completed before the end of the sophomore year.

A program of concentration should include at least six courses at the 200 level in English and American literature and the balance in acceptable allied fields to make a total of ten courses.

These advanced courses are to include English 206 (Chaucer) or English 213 (Milton and Later Renaissance), and one course each from any two of the three following periods: sixteenth and seventeenth centuries (210, 211); eighteenth century (214, 215, 216); or nineteenth century (217, 218, 219).

At least two of these specific requirements are to be met by the end of the junior year, including either or both 206 and 213.

At least one of the courses required for the major is to be in American literature, taken at either the 100 or 200 level. Ordinarily, students will not take more than one of the group English 221, 223, and 224.

*Two courses if the Shakespeare requirement is met by taking English 212 instead of English 144.
Concentrators working for a secondary school teaching certificate may substitute not more than one of English 115, 123, or 124 for one of the 200 courses in English not listed as a requirement.

On the basis of this historical foundation, the concentrator will wish in the remainder of his choices to pursue particular interests—for example, in the drama or in the novel. The minimum two courses in allied fields should be selected, in consultation with the student's adviser, from among specified courses in History, Philosophy, Fine Arts, Foreign and Comparative Literature, Anthropology, Languages and Linguistics, and certain others. Especially recommended are courses in the History of England and Greater Britain, preferably to be completed before the junior year.

Students majoring in the Honors Program are required to fulfill similar requirements, except that they may do so by taking a combination of courses and seminars.

Outstanding senior English majors who are not in the Honors Program may be invited to register for a tutorial, English 293, in which they will prepare an essay to be considered, along with other evidence, for the Degree with Distinction. Designed to give such qualified seniors an exceptional opportunity for independent study, English 293 also counts as one of the six 200-level English courses required for the major.

Students transferring into the College from elsewhere and who wish to be admitted for a concentration in English will need to make individual arrangements with the Department regarding the satisfaction of underclass requirements.

102. Continental Masterpieces. A course which aims to develop the understanding and enjoyment of literature through the reading of great works, especially for their expression of enduring problems of mankind. Books are selected from the classics of ancient and medieval periods. Open to all students. Required of English concentrators.

103. English and American Masterpieces. Books are by English and American writers and are selected from the Renaissance and modern periods. Open to all students except juniors and seniors who are concentrating in English.


111. Exposition and the Analysis of Ideas in Literature. An introduction to problems in writing expository and argumentative prose through critical analysis and evaluation of selected literary works. Readings from such authors as Orwell, Baldwin, Sophocles, Joyce, Shakespeare, Conrad, and Hemingway. Instruction will include close supervision of written assignments through the use of small discussion groups. This course is usually offered in the first semester only.

115. Advanced Expository Writing. Principles and practice of expository and argumentative writing; frequent papers and exercises, with class discussion of student work. Generally open to sophomores, juniors and seniors with grades of B or better in English. Sophomores by special arrangement with the instructor. For admission to this course, written permission of the instructor is needed.

116. Creative Writing. Short story, poetry, and playwriting workshop. A weekly three-hour meeting for criticism and discussion. Frequent conferences. The student is encouraged to improve by constant comparison of his work with the best achievements in fiction or poetry. May be repeated for credit with the consent of the instructor.

123. Speech. A basic course designed to clarify the principles underlying sound and effective speaking of all sorts. Practice and training in group discussion, individual expository, argumentative, and other speeches, and reading aloud. Sections limited to 15 students.

124. Oral Communication of Literature. Practice and training in transmitting varied works of various kinds of literature by reading them aloud. By permission of the instructor.

126. 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.

130. Concepts of Literature. An introduction to practical critical analysis involving the close study of major texts of literature primarily written in English and drawn from prose non-fiction, fiction, drama, and poetry. (Not open to students who have taken Eng 111.)
132. **Narrative Literature.** A study of representative ways in literature of dealing with experience, using narrative forms, the reading to be drawn primarily from works in English.

133. **Dramatic Literature.** A study of a broad selection from world drama of many periods, considered as illustrations of the range of representations of experience within the conventions of the theaters which produced the plays.

141. **Classic American Literature.** A study of the most significant achievements by American writers of poetry, fiction and other prose in the nineteenth and twentieth centuries.

144. **Shakespeare.** An introductory study of Shakespeare's major plays. Either 144 or 212 is required of all students concentrating in English.

200. **History of the English Language.** Development of English sounds, inflections, syntax, and vocabulary, with special emphasis on the structure of present-day English as described by modern linguistic analysis. Recommended for those planning to teach English.

201. **Introduction to Old English.** Development of a reading knowledge of Old English poetry and prose, with emphasis on specimens of Old English literature rather than on the structure of the language.

202. **The Old English Epic.** The structure of Old English heroic poetry, with emphasis on Beowulf. Prerequisite: English 201.

See Linguistics 211. Structure of Modern English.
206. Chaucer. A study of the principal works of Chaucer, in their historical and intellectual context. Readings in Middle English.

207. Middle English Literature. A survey of Middle English literature exclusive of Chaucer. The readings include *Piers Plowman, Sir Gawain and the Green Knight, Pearl,* folk romances, lyrics, mystery plays, and Malory's *Morte Darthur.* Readings in Middle English.

210. The English Renaissance. A study of such influential continental writers as Petrarch, Boccaccio, Castiglione, Erasmus, and Montaigne, and of the writers of the English Renaissance from More to Spenser.

211. English Literature of the Earlier Seventeenth Century. Leading poets and prose writers from Donne and Bacon to 1660.

212. Shakespeare and His Contemporaries. A study of representative comedies, histories, and tragedies of Shakespeare. Read in conjunction with the work of other Elizabethan dramatists.


215. The Augustan Age (1700-1750). Prose, poetry, criticism, and selected drama with emphasis on Swift, Addison, and Pope.

216. The Age of Johnson (1750-1798). Literature of the later part of the Neo-Classical era, particularly the writings of Dr. Johnson and his circle.

217. Romantic Literature. Major writers, other than novelists, of the early part of the nineteenth century, with particular emphasis on poets from Blake through Keats.

218. Victorian Issues. The major intellectual controversies of the Victorian period as framed by the chief prose writings from Carlyle to Pater.

219. Victorian Poetry and Poetics. A study of the major Victorian poets from Tennyson to the early Yeats, and of the critical problems they confronted.

220. American Puritans Through the Early Romantics. From 1630 to 1830, including Bradford, Taylor, Mather, Edwards, Franklin, Freneau, Cooper, Bryant, and others.

221. The American Renaissance. From 1830 to 1865, including Emerson, Hawthorne, Poe, Thoreau, Melville, Whitman and others. Not open to students who have taken English 141.

222. American Realists. From 1866 to 1912, including Dickinson, Twain, Howells, Henry James, Henry Adams, William James, Stephen Crane, Norris, Dreiser, Robinson, and Frost.

223. American Moderns. From 1913 to 1941, including Eliot, Stevens, Faulkner, Hemingway, Fitzgerald, O'Neill, W. C. Williams, and others.

224. American Contemporaries. From 1941 to the present, including Roethke, Lowell, Williams, Bellow, Arthur Miller, Tennessee Williams, Baldwin, Nabokov, and others.

225. American Criticism and Culture. From Emerson to the present, including, among others, Poe, Whitman, Henry James, Henry Adams, William James, Santayana, Pound, Eliot, Wilson, Burke, and Paul Goodman.

230. The English Novel. The novel from the beginnings to the early nineteenth century, emphasizing such novelists as Defoe, Fielding, Richardson, and Austen.

231. The English Novel from Austen to Conrad. Emphasizing such novelists as Dickens, Thackeray, Eliot, and Hardy.

232. The Modern English Novel. The novel from 1900 to the present, emphasizing such novelists as Conrad, Joyce, and Lawrence.

233. Medieval Drama. English drama from its beginnings until 1580, including material from the mystery cycles, moralities, and early Tudor drama.


235. Modern Drama. Great modern dramas from Ibsen to Eliot as reflectors of the main currents in modern thought and feeling.


241. Comedy and Satire. The uses of the comic spirit in a range of great literature.


245. Literary Criticism. A survey of the major critics from Aristotle to Coleridge.

Courses numbered 250 to 299 are special courses limited in enrollment. They will usually be devoted to intensive examination of particular writers, forms, or literary problems. The content of these courses is not specified, because it will be determined from the interests of students and instructors and will vary from time to time. Annual schedules will describe the content of a given course in a given semester and will indicate prerequisites for admission, if any.


251. Studies in Medieval Literature.


254. Studies in Drama.
291. Reading Course in English.
293. Tutorial Course. For selected senior English majors pursuing the Degree with Distinction.

400 Level Courses
Qualified undergraduates may enroll in advanced seminars at the 400 level by permission of the Director of Graduate Studies in English and the instructor.

HONORS IN ENGLISH
Qualified students should apply for admission to English Honors early in the second semester of their sophomore year expecting to participate in the program throughout their junior and senior years. Occasionally a student may be admitted to the program at the end of the first semester of his junior year, or even rarely at the beginning of his senior year.

Each Honors candidate will be assigned to an Honors adviser and will be expected to consult him frequently.

Within the limits specified below each Honors student may set his own goals and prepare himself for examinations in three areas of knowledge.

1. The life and work of a single writer. Considerable choice is permitted providing the writer is considered important. If this writer is an Englishman, at least one of the other two areas must involve some American writing. If the writer is an American, at least one of the areas must involve some English writing.

2. A cultural development spanning more than one century (not including the life-time of the individual figure chosen) emphasizing the imaginative writing of the time. The student should connect this writing with intellectual currents, historical events, and the other arts besides literature. If the category chosen is American culture, the individual writer chosen must be an Englishman.

3. The development of a significant genre (lyric, narrative, dramatic, or critical) or mode during a period of time longer than the period of cultural development studied. Genre and mode (comic, tragic, or satiric) might be considered.

A student may prepare for examinations in these three areas by selecting lecture courses, studies courses, reading courses, and Honors seminars in varied fields and subjects. With the advice and permission of his Honors adviser, a student who proves himself able to work with complete independence may be exempted from formal courses. Honors candidates will be expected to do some work each year at an advanced level in some subject other than English or American literature. Whenever possible this shall be work qualifying as Honors work in another department and may be pursued informally.

301. Chaucer. A study of his chief literary works, with emphasis on The Canterbury Tales and Troilus and Criseyde.
304. Shakespeare. A study of his complete works.
307. Renaissance Literature. A consideration of the main themes in poetry and prose as expressed by the leading writers of the age. Omitted 1968-69
309. Seventeenth-Century Literature. Poetry and prose written between the end of Elizabeth's reign and the Restoration excluding the writings of Milton.
313. Eighteenth-Century Literature. A study of 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.
316. Romantic Literature. A study of the major writers. Omitted 1968-69
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 1968-69
331. The English Drama. A study of the drama both as a social force and as an artistic form from classical times to the present. Omitted 1968-69
336. The English Novel. Development of English prose fiction from Defoe to the present. Comparative Literature courses 350 Literary Criticism and 352 Tragedy when offered by a member of the Department of English are acceptable as English Seminars.
391. Reading Course for Honors Students.
The Department of Fine Arts offers courses in the history of the visual arts and in studio arts. Such work may lead to a concentration for the B.A. degree, and, at the graduate level, to the M.A. degree in art history.

**Concentration in Art History:** Fine Arts 101 and 102 are prerequisite to most art history courses and to the concentration program. Students intending to major should have completed these courses by the end of the sophomore year. A program normally consists of eight advanced courses in Art History chosen from the ancient, medieval, Renaissance, modern, and oriental fields. Work in creative art is strongly recommended. Two related courses from allied fields are also required. A concentration in Art History provides basic training for college teaching, museum work, and other professional applications of the discipline.

**Concentration in Studio Arts:** Students interested in concentrating should consult the Associate Chairman for Studio Arts who will direct the arrangement of programs consistent with their interests.

Although the Studio Arts program is not strictly pre-professional, it is intended both to allow the student to explore his own creative abilities and to prepare for further study and professional work.
Comprehensive Examination: A comprehensive examination will be required of all majors. For Art History there will be three days of written examinations covering both factual materials and principles. Integration of the arts is stressed. In Studio Arts, in lieu of a written examination the requirement will be: In his senior year each student will be required to present a demonstration of his creative ability and will be given an oral examination by at least three members of the Studio Arts faculty.

101. Introduction to Ancient and Medieval Art. This course and its sequel introduce 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. This course is devoted to Egyptian, Greek, Roman, Early Christian and Medieval art. 


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.

105. History of Photography. The study of the growth and development of photography from its beginnings to the present day, with special emphasis on the history of the medium as a vital contribution to the visual arts.

107. History and Aesthetics of Motion Pictures. An introduction to the history of cinema as developed in major producing countries; exploration of the aspects of specific films tending to characterize a unique art form. Enrollment limited to seventy-five—Two lectures and one two-hour screening session per week.

108. The Cinema as an Art Form. An advanced course in the nature of the art of motion pictures, including screening and detailed critiques of the most significant films of the master directors. Enrollment limited to seventy-five. Prerequisite: Art History 107 or consent of instructor.

110. History of Western Dance. A survey of western dance from the ancient Mediterranean origins to the contemporary period.


202. Greek and Roman Art. Painting, sculpture, and architecture of ancient Greece and Rome. The lectures throw light on the religion, traditions, society, and cultural values of the Greeks and Romans as expressed in their art forms.

204. Medieval Art. Origin and development of Romanesque and Gothic art in France, Italy, Spain, Germany, and England, with emphasis on architecture and sculpture.


218. Modern Sculpture. An examination of the nature of sculptural expression in Europe and America from Daumier to the present. Attention is given to such movements as cubism and constructivism, to the influence of painting on sculpture, and to certain technical considerations which have led to the development of new forms of sculpture. Omitted 1968-69

222. The Painting of China and Japan. Masterpieces of Far Eastern painting are studied in their historic contexts and in their relation to each other. Oriental painting techniques as well as individual, period, and national styles are stressed.

224. The Arts of Japan. A survey of the major arts of Japan in their historical sequence with special emphasis upon the development of a national style.

226. The Arts of Buddhist Asia. The development of Buddhist art is traced from its origins in India to its easternmost manifestations in Japan and Indonesia. Factors of art style as well as those of iconographical and iconological character are considered. Omitted 1968-69
231. Italian Art of the Early Renaissance. A survey of the development of the principal schools of Italian painting and sculpture from the latter half of the 13th century to the middle of the 15th.

232. Italian Art of the Renaissance and Baroque Periods. After discussion of fundamental Renaissance concepts in mid-fifteenth century Florence, the development of Italian painting and sculpture is followed through the classic and mannerist phases to the seventeenth century Baroque, Leonardo da Vinci, Michelangelo, and Bernini are stressed.

233. Venetian Art. The flourishing of the arts—painting, sculpture, and architecture—as they relate to the development of Venetian culture from the fifteenth through the eighteenth centuries. Omitted 1968-69

236. Five Italian Masters of the High Renaissance. A careful examination of five great figures—Leonardo da Vinci, Raphael, Michelangelo, Giorgione, and Bramante—and their contributions to the art of 1490-1520. For upperclassmen and graduate students who have had a course in Italian Renaissance art or history.

237. Seminar in European Graphic Arts. Devoted primarily to the development of prints from the Renaissance to the early 19th century. Study of iconography and meaning as well as style, technique and connoisseurship through examination of originals. Permission of instructor.

238. Northern European Painting I. A study of the development of painting in the Netherlands, France, and Germany from about 1400 to 1600. Jan van Eyck, Roger
van der Weyden, Bosch, and Bruegel receive special emphasis.

239. Northern European Painting II. Baroque and rococo painting in the North, including Spain, from about 1600 to 1800. El Greco, Velasquez, Rubens, Rembrandt, Poussin, and Watteau are given special consideration.

Omitted 1968-69

240. French Painting from Poussin to David. A study of the French school in relation to the artistic milieux of the period; artistic policy and doctrine, taste, and social developments within the Ancien Régime.

241. Modern European Painting to 1885. 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. AH 102 prerequisite.

242. Modern European Painting Since 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. AH 102 prerequisite.

243. Ut Pictura Poesis. From Baroque through Cubism, covering topics like beauty, nature, Portrait, Landscape, and the breakdown of the traditional relation between the arts.

244. American Architecture. Colonial, Early Republican, eclectic, and modern styles of American architecture from the seventeenth century to the present. Special attention is given to the English colonial tradition, to the spirit of nationalism underlying the architecture of the Early Republic, and to American contributions to modern architecture.

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 are considered.

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.

Aesthetics and Art Criticism. See Philosophy 241, 244.

Primitive Art. See Anthropology 210.

475. Art Museum Theory and Practice I. A study of the art museum in society, including its history, philosophy, and current functions. Seminars, assigned readings, reports, research projects, and some actual participation, under staff supervision, in the day-to-day activities of the Memorial Art Gallery. Admission by consent of the instructor. — One three-hour meeting per week. Memorial Art Gallery.

476. Art Museum Theory and Practice II. Continuation of Art History 475.
PAINTING AND SCULPTURE (SA)

111. Introductory Sculpture I. A studio course intended to familiarize the student with the nature of sculpture. Problems in three dimensional design and sculpture in a variety of media. Admission by consent of the instructor.

112. Introductory Sculpture II. A continuation of SA 111 which is prerequisite. Class limited to fifteen students. Admission by consent of instructor.

113. Introductory Drawing I. Basic problems of representation and perspective. Admission by consent of instructor.

114. Introductory Drawing II. Figure drawing; a continuation of SA 113 which is prerequisite. Admission by consent of instructor.

211. Intermediate Sculpture I. The figure, life modelling and composition based on the figure in a variety of media. SA 111, 112 or previous experience prerequisite.* Not for graduate credit.

212. Intermediate Sculpture II. Problems in composition. Students are encouraged to work toward greater technical competence and more personal expression. SA 111, 112 or previous experience prerequisite.* Not for graduate credit.

213. Intermediate Painting I. Problems in oil painting with emphasis on color theory. Prerequisites: SA 113, 114.

214. Intermediate Painting II. A continuation of SA 213 with emphasis on individual expression and independent research. Prerequisite: SA 213.

293. Independent Projects.

THEATRE (SA)

121. Introduction to Acting and Directing. Study of the fundamentals of staging for the actor and the director, with emphasis on character objectives and scene patterns. Most class time will concentrate on scenes and short plays with student actors, staged by student directors. Permission of instructor required. Omitted 1968-69

231. Acting. Study and application of the methods by which the actor externalizes the role. Readings, scenework, and production of a major classic for public performance. Not for graduate credit. Prerequisite: SA 121. Omitted 1968-69

293. Independent Projects.

DANCE (SA)

101. Modern Dance Technique I. Beginning level. This course will be taught for two semesters for one course credit.—Three classes per week plus individual work.

102. Modern Dance Technique IA. Continuation of 101, which is prerequisite. One course credit for the successful completion of 101 and 102.

103. Modern Dance Technique II. Intermediate level. Two semesters carry one course credit.—Three classes per week plus individual work.

104. Modern Dance Technique IIIA. Continuation of 103, which is prerequisite. One course credit for the successful completion of 103 and 104.

105. Dance Composition I. An introductory course designed to develop an awareness of the basic elements of the dance with emphasis on sharpening perception of the environment as a source of stimulation for movement. Readings required. Prerequisite: SA 101 and 102 or 103 and 104. Permission of instructor required.—One three-hour period, three technique classes, plus additional work.

201. Dance Composition II. A study of dance form, especially as related to music. Reading and reconstructions required. Prerequisites: SA 105. Music 101. Permission of instructor required. Not for graduate credit.—One three-hour supervised period, three technique classes, plus additional work.

202. Dance Composition III. A study of composition for groups. Prerequisites: SA 201, 111. Not for graduate credit.—One three-hour supervised period, three technique classes, plus additional work.

293. Independent Projects.

PHOTOGRAPHIC ARTS (SA)

131. Creative Photography I. A workshop course in which assigned visual problems, readings, and an independent photographic project will be required. Students will need an inexpensive camera and will be responsible for the purchase of their own photographic materials. Prerequisite: AH 105 or permission of the instructor.

132. Creative Photography II. Application in greater depth of the techniques and disciplines learned from Creative Photography I. Emphasis on individual projects and independent work. Prerequisite: SA 131, or consent of instructor. Omitted 1968-69

293. Independent Projects.

ARTS WORKSHOP (SA)

241. Arts Workshop I. Comparisons and application of the elements, structures, and processes of composition in dance, drama, sculpture, painting, music, poetry as individual and interrelated creative activities. The main concern of the semester will be the use of space. Prerequisites: Two of the following—SA 101 and 102, 111, 113, 121. Not for graduate credit. Omitted 1968-69

242. Arts Workshop II. This course is a continuation of Arts Workshop I and is concerned with sequence and the use of time in art forms. Prerequisite: SA 241. Not for graduate credit. Omitted 1968-69

*Two supervised periods of three hours and one period of independent work.
The Department of Foreign and Comparative Literature offers work in Chinese, Classics, French, German, Russian, and Spanish literature leading to the B.A. degree. The Department also offers the M.A. and Ph.D. degrees in French and German Literature.

REQUIREMENTS AND RECOMMENDATIONS FOR CONCENTRATIONS

Chinese: Mr. Compton, adviser
1. A minimum of six literature courses numbered 203 and above.

Comparative Literature: While there is no longer a formal undergraduate major in Comparative Literature, the Department offers a number of courses and seminars under this heading.

2. At least four courses in related fields to be chosen from among the following: Fine Arts 222, 224, 226; History 281, 282, 286; Japanese 201, 202, 203, 285, 286.

3. Concentrators intending to go on to graduate study are strongly urged to do formal work in the Japanese language, and to develop a sound reading knowledge of French and German.
Classics: Mr. Geier, adviser
A student must concentrate in either Greek or Latin literature. This concentration will consist of:

1. At least eight courses numbered 103 and above.
2. A minimum of two courses in related fields (e.g., other ancient languages, ancient history, art, archeology, philosophy, linguistics, literature).
3. Concentrators intending to go on to graduate study are strongly urged to pursue formal work both in Latin and Greek literature, and to develop a sound reading knowledge of at least one of the following modern languages: French, German, or Italian.

French, German, and Spanish
French advisers: Mrs. Dobbs, Mr. Berk
German adviser: Mr. Loose
Spanish adviser: Mr. Dunn
1. At least six courses numbered 131 and above for concentrators in German and Spanish; a minimum of six courses at the 200-level and above for concentrators in French.
2. Two advanced composition courses: French, German, or Spanish 200 and 220, or equivalent work done during an approved Junior Year Abroad program.
3. A minimum of two courses in related fields (e.g., history, linguistics, literature, philosophy).
4. Concentrators intending to go on to graduate study in French or Spanish are strongly urged to develop a sound reading knowledge of German and Latin; French and Latin are recommended as secondary languages in preparation for graduate work in German.

Russian: Mr. Rosen, adviser
1. At least six literature courses numbered 131 and above; these must include 234, 235 and one course on a major Russian writer.
2. A minimum of four courses in related fields (e.g., advanced Russian language, history, literature).
3. Concentrators intending to go on to graduate study are strongly urged to include in their related work as many as possible of the following: English 231; French 131, 132, 221; German 131, 132; History 265, 266, 267.

THE SENIOR ESSAY
All concentrators in foreign literatures are required to write a Senior Essay during their last year of study. In the fall of the senior year students must register for the 295 course in the field of concentration. The subject of the Essay will be chosen in consultation with the professor in charge of that course and, at his recommendation, with appropriate members of the Department. The major part of the research for the Essay will be done during the fall term; the completed Essay is to be submitted in mid-April. Precise indications as to the scope of the Essay, research, bibliographical and stylistic procedures, will be made known at the first meeting of the 295 course.

STUDENT TEACHING
Concentrators interested in student teaching experience for the purpose of New York State certification should be in touch with Mr. W. H. Clark (327 Hopeman) as well as their adviser.

CHINESE

251. Introduction to Classical Chinese. Reading and analysis of Confucian and Taoist texts. Prerequisite: Chinese 203.

261. Essays of the Tang and Sung. Selected essays in the k'o-hsüen style by such writers as Han Yu, Liu Tsungtuan, and Ouyang Hsiu. Prerequisite: Chinese 251.

273. Chinese Historical Texts. The Standard Histories (ching shih) and other pre-modern historical materials. Readings in English; concentrators will be required to read selected portions in the original. Omitted 1968-69

284. Chinese Literature in Translation. Selected poetry, short stories, essays, and novels, from the classical period to the present.


287. The Chinese Novel. Dream of the Red Chamber, Monkey, Shih Hu Ch'uan, Chin Ping Mei, and other vernacular masterpieces from Sung to modern times. Readings in English.

288. Modern Chinese Literature. A survey of Chinese literature from 1900 to the present, emphasis on China's response to the West, and Chinese communist literature; readings include Lu Hsüan, Pa Chin, Mao Tse-tung. Readings in English.

291. Reading Course. Study of special literary problems under the direction of a member of the staff.

295. Senior Essay. A paper based upon independent study; required of concentrators as part of the Senior Comprehensive Examinations. Students should normally register for this course in the fall term of their senior year.

CLASSICS

GREEK

200. Introduction to Greek Literature I. Readings from Plato.

201. Introduction to Greek Literature II. Agamemnon of Aeschylus and Oedipus of Sophocles.


203. Greek Comedy. Omitted 1968-69
291. Reading Course. Study of special literary problems under the direction of a member of the staff.

295. Senior Essay. A paper based upon independent study; required of concentrators as part of the Senior Comprehensive Examinations. Students should normally register for this course in the fall term of their senior year.

LATIN

103. Introduction to Latin Literature. Pliny's Letters and selected readings in Virgil, Horace, Catullus, Tacitus, and Suetonius, as their names are encountered in the Letters.

200. Roman Philosophy. Cicero, Lucretius, Seneca; their debt to Greek philosophy and influence on Christian thought.


203. Roman Comedy. Plautus and Terence; their relation to Greek New Comedy and influence on later comedy.

204. Ovid. Some knowledge of Latin required. The Metamorphoses will be read in Latin, with the aid of an English translation, and studied as poetry and as mythology.

205. Roman Lyric and Elegiac Poetry. Catullus, Tibullus, Propertius, Ovid.


207. Roman Satire. The origins and history of genre; selections from Lucullus, Horace, Lucan, Persius, Juvenal, and Petronius.

220. Medieval Latin. Literary Latin from the 6th to the 13th century; the distinction between Vulgar and Medieval Latin; rapid reading of texts from Harrington's anthology; close reading of a couple of select complete texts; the influence of Medieval Latin writing on the vernacular literatures.

250. Prose Composition. Practice in writing Latin prose in the various styles.

291. Reading Course. Study of special literary problems under the direction of a member of the staff.

295. Senior Essay. A paper based upon independent study; required of concentrators as part of the Senior Comprehensive Examinations. Students should normally register for this course in the fall term of their senior year.

CLASSICS IN TRANSLATION

151. Classics of the Graeco-Roman Tradition: Aeschylean and Sophoclean Tragedy. All fourteen extant plays of Sophocles and Aeschylus; study of critiques of Aristophanes, Plato, and Aristotle.


153. Classics of the Graeco-Roman Tradition: Plutarch's Parallel Lives. The nature of the work; its purpose and function; its place in the history of biographical literature; study of selected biographies of individuals of the Graeco-Roman world.

156. Classics of the Graeco-Roman Tradition: Seneca's Tragedies. The nature of Seneca's tragedies; Seneca's debt to the Greek tragedians and the influence of his work on later tragedy.

157. Classics of the Graeco-Roman Tradition: Petronius. The Satyricon; its place in the literature of Graeco-Roman Essays. The nature of the work; its purpose and function; its place in the history of essay literature; study of selected essays of Petronius and other Graeco-Roman essayists.

160. Classics of the Graeco-Roman Tradition: The Roman Prose Anthology. The nature of the work; its purpose and function; its place in the history of Latin literature; study of selected passages from the Roman Prose Anthology.

161. Classics of the Graeco-Roman Tradition: The Roman Prose Anthology. The nature of the work; its purpose and function; its place in the history of Latin literature; study of selected passages from the Roman Prose Anthology.

162. Classics of the Graeco-Roman Tradition: The Roman Prose Anthology. The nature of the work; its purpose and function; its place in the history of Latin literature; study of selected passages from the Roman Prose Anthology.

163. Classics of the Graeco-Roman Tradition: The Roman Prose Anthology. The nature of the work; its purpose and function; its place in the history of Latin literature; study of selected passages from the Roman Prose Anthology.

COMPARATIVE LITERATURE

See Fine Arts 243. Ut Pictura Poesis.

269. The European Novel. Stendhal, Tolstoy, Dostoevsky, Thomas Mann, Joyce, Malraux, and Kafka. Prerequisites: Reading knowledge of French, German, or Russian.

291. Reading Course. Intended primarily for advanced students wanting to study specific literary problems across national boundaries. Prerequisites to be set by the instructor.

309. European Literature of the Renaissance. Emphasis on the major achievements of Petrarch, Boccaccio, Rabelais, Ronsard, Montaigne, Erasmus, Spencer, Ariosto, Cervantes; investigation of the concepts 'Renaissance,' 'Humanism,' and of the main intellectual and aesthetic interests of the age.

310. Philosophy and Poetry. The ancient quarrel between them, their rival claims, their convergence; the philosophical and didactic poem (Hesiod, the Platonic myths, Lucretius, Dante); philosophy's use of metaphor and imagery (Plato, Aristotle, Descartes, Heidegger, Wittgenstein).


341. Studies in Chinese Literature and Thought. The major literary genres and schools of thought; emphasis on relationships between literature and Confucianism, Taoism, and Buddhism. Readings in English.

350. Literary Criticism. Studies of major literary critics from the time of Aristotle to the present.

352. Tragedy. A study of tragic themes and tragic behavior in drama and fiction with texts chosen from Aeschylus to Mann, Camus, and Brecht. Prerequisite: French or German 131, 132.

355. Dante and Medieval Culture. Emphasis on allegory and structure in the Divine Comedy; introduction, through the poem, to the spirit of the Middle Ages. Readings in English.


359. Baroque Lyric and Reflective Poetry. Contemporary theories of renaissance and baroque poetry; stylistic analysis of the impact of continental Europe on Petrarchism, Cervantes, Marlowe. Prerequisite: French, German, or Spanish 131, 132.
375. Problems in Comparative Literature. Confessional literature; the gradual intrusion of the novelist on his work; the problem of literary sincerity; representative writers from Rousseau to Kafka. Prerequisite: French or German 131, 132. Omitted 1968-69

EUROPEAN LITERATURE IN TRANSLATION


109. European Literature in Translation II. Readings in the major genres of European literature since the Romantic movement. Continuation of 108.

210. Medieval Epic and Romance. Readings in the genres of epic and romance including Beowulf, the Song of Roland, Parzival, Chrétien de Troyes, the Romance of the Rose, and Mallory; examination of the Grail theme, courtly love, and problems of Medieval narrative.

FRENCH

NOTE: French 131 and 132 are prerequisite for all 200-level courses in French literature.

131. Introduction to Modern French Literature. Close reading of representative 19th- and 20th-century poetry and fiction; practice in the explication de texte method. Prerequisite: satisfactory performance on Placement Examination or in French 103, or permission of the instructor.

NOTE: In the fall term only, section 1 of this course will be offered as a Preceptorial with enrollment limited to 15 freshmen.

132. Masterpieces of French Literature to 1800. Survey of chief literary movements and forms from the late Middle Ages through the Enlightenment. Prerequisite: French 131 or consent of the instructor.

200. French Prose Style. Inquiry into the artistic and expressive resources of the French literary idiom through explication de texte, composition, and translation into French of a wide variety of samples of English prose. Not for graduate credit.


220. Literary Phenomenology of the Bourgeois. Representations of, changing attitudes to, and criticism of the Bourgeois and his world, from Molière to Sarraute. Omitted 1968-69

221. The French Novel to 1850. Development of the genre from the classical period to its triumph in the first half of the 19th century.

222. The French Novel Since 1850. Evolution of the genre from Realism to the nouveau roman.

223. French Lyric Poetry to 1800. An introduction to the French lyric tradition from the Middle Ages to André Chénier, with emphasis on renaissance poetry. Omitted 1968-69


225. The French Drama to 1800. Survey of the genre from the Renaissance to Beaumarchais; emphasis on Corneille, Racine and Molière.

226. The French Drama Since 1800. Representative plays from romantic melodrama to the “theater of the absurd”; some attention will be paid to the relevant theoretical statements.


240. Descartes and Pascal. An introduction to the major works of Descartes and Pascal; study of their thought, milieu, and influence on French classicism. Omitted 1968-69


265. 18th-Century French Literature. Montesquieu, Voltaire, Diderot, Rousseau, Beaumarchais; also other playwrights and philosophes.


269. Dadaism and Surrealism. Studies of these two movements as they relate to literature and the once fine arts; the course will be experimental and conducted in the spirit implied by the title: active, creative, and imaginative student participation and projects will be required. Open to juniors and seniors; graduate students only by written permission of the instructor.


286. 20th-Century French Poetry. A study of avant-garde movements (Futurism, Dada, L'Esprit nouveau, Surrealism, etc.) and the renewal of lyricism from Jacob, Apollinaire, and Cocteau to the present. Omitted 1968-69


291. French Reading Course. Study of special literary problems under the direction of a member of the staff.

295. Senior Essay. A paper based upon independent study; required of concentrators. This paper and the advanced test of the Graduate Record Examination together comprise the senior comprehensive examination in French literature. Students should normally register for this course in the fall term of their senior year.
GERMAN

NOTE: German 131 and 132 are prerequisite for all 200-level courses in German literature.

131. Introduction to Modern German Literature. Close reading and analysis of representative works of poetry and fiction of the 19th and 20th centuries. Prerequisite: satisfactory performance on Placement Examination or in German 103, or permission of the instructor.

NOTE: In the fall term only, section 1 of this course will be offered as a Preceptorial with enrollment limited to 15 freshmen.

132. Masterpieces of German Literature to 1832. An introduction to selected works of German literature as seen in their historical and stylistic context. Prerequisite: German 131 or consent of the instructor.

200. German Prose Style. Inquiry into the artistic and expressive resources of the German literary idiom through explication de texte, composition, and translation into German of a wide variety of samples of English prose. Not for graduate credit.

208. German Literature: 800-1750. Selections from medieval epic and lyric poetry, the literature of the Renaissance, Reformation, and the Baroque.


212. Textual Analysis. Close reading of selected authors from the 17th century to the present. Emphasis on imagery, rhetorical devices, evolution of the various styles. Omitted 1968-69

265. Eighteenth-Century Literature I. Development of German literature from 1720 to 1785, with emphasis on Lessing and the young Goethe. Omitted 1968-69

266. Eighteenth-Century Literature II. Works of Goethe and Schiller from 1785 to 1805, in the "Classical" period of German Literature. Omitted 1968-69

269. Readings in Goethe. Iphigenie auf Tauris, Torquato Tasso, Egmont, Die Wahlverwandtschaften; and selections from the lyric poetry.


277. Nietzsche. Ontology, rhetoric, philosophy of language, the theory of tragedy; the Apollonian-Dionysian antinomy in Nietzsche’s aesthetics. Omitted 1968-69


286. Modern German Prose. The shorter narratives of Hauptmann, Thomas Mann, Kafka, Benn, and Brecht.

295. Senior Essay. A paper based upon independent study; required of concentrators as part of the Senior Comprehensive Examinations. Students should normally register for this course in the fall term of their senior year.

INDIAN

201. An Introduction to the Indian Civilization I. The culture of ancient and medieval India from the prehistoric "Harrapa Culture" to the threshold of the Indo-Turkish period. Examination of the essential background for an understanding of Hinduism.

202. An Introduction to the Indian Civilization II. The impact of Islamic and western European culture on Indian intellectual traditions with emphasis on those elements of the traditional culture employed by 20th-Century Indians to symbolize an Indian identity.

231. Theater in India I. History and literature of Indian theatre to the medieval period. Analysis of plays and their epic and poetic backgrounds. Aesthetic and dramatic theories and techniques.

232. Theater in India II. Continuation of 231. Traditional play from the medieval period to the present. The impact of foreign theatre. Experimental production of a play during the second half of the semester. Prerequisite: 231 or instructor's permission.

ITALIAN

131. Introduction to Italian Literature. Close reading of selected works: lyric poetry from its origins to the present day with special attention to Ferrara and Leopardi; short stories of Boccaccio, Machiavelli, Moravia, etc.; Iphigenie auf Tauris, Torquato Tasso, Egmont, Die Wahlverwandtschaften; and selections from the lyric poetry.

201. Pushkin. His life and times; intensive study of Eugene Onegin and other poems. Prerequisite: Russian 121 or 131.

203. Russian Drama of the 19th Century. The dramatic art of Pushkin, Gogol, Turgenev, Tolstoy, Chekhov, and Gorky. Readings in English. Concentrators will be assigned selected portions in the original language.

Omitted 1968-69

204. Turgenev. Analysis of his major works. Conducted in Russian; readings in Russian.

Omitted 1968-69

205. Nineteenth-Century Lyric Poetry. Emphasis on Tiutchev & Fet. Prerequisite: Russian 121, Russian Literature 131, or equivalent.

206. Lermontov. An intensive study of his poetry and prose (The Hero of Our Time) with emphasis on formal aspects. Reference will be made to themes of Romantic literature. Readings in Russian.

207. Gogol & Dostoevsky. Intensive study of Gogol's prose and dramatic works with emphasis on stylistic features. Contemporary literary issues and Gogol's influence on Dostoevsky's early works. Readings in English; a knowledge of Russian is useful but not essential.

222. The Russian Short Story. Close study of works by Pushkin, Gogol, Turgenev, Dostoevsky, Tolstoy, Chekhov, and some Soviet authors. Readings in English.

230. The Classic Russian Novel. The beginning, development, and demise of the Great Age from Gogol to Chekhov. Readings in English with special assignments for those who read Russian.

Omitted 1968-69

233. Nineteenth-Century Russian Literature. The major works of both authors in English translation. Concentrators will be assigned selected portions in the original language.

Omitted 1968-69

234. Tolstoy and Dostoevsky. The major works of both authors in English translation. Concentrators will be assigned selected portions in the original language.

Omitted 1968-69

235. Nineteenth-Century Russian Literature. The major works of both authors in English translation. Concentrators will be assigned selected portions in the original language.

Omitted 1968-69

236. Modern Russian Literature. The Symbolist movement; writers from Gorky to Pasternak; the "thaw" period. Readings in English. Concentrators will be assigned selected portions in the original language.

Omitted 1968-69

291. Reading Course. Study of special literary problems under the direction of a member of the staff.

295. Senior Essay. A paper based upon independent study; required of concentrators as part of the Senior Comprehensive Examinations. Students should normally register for this course in the fall term of their senior year.

SPANISH

NOTE: Spanish 131 and 132 are prerequisite for all 200-level courses in Spanish literature.

131. Introduction to Modern Spanish Literature. Close reading and analysis of representative works of poetry, drama, and fiction of the 19th and 20th centuries. Prerequisite: satisfactory performance on Placement Examination or in Spanish 103, or permission of the instructor.

NOTE: In the fall term only, section 1 of this course will be offered as a Preceptorial with enrollment limited to 15 freshmen.

132. Masterpieces of Spanish Literature to 1800. Survey of the late Middle Ages to the beginning of Romanticism; emphasis on the siglo de oro. Prerequisite: Spanish 131 or consent of the instructor.

200. Spanish Prose Style. Inquiry into the artistic and expressive resources of the Spanish literary idiom through explication de texte, composition, and translation into English of a wide variety of samples of English prose. Not for graduate credit.

210. Medieval Spanish Literature. Study of representative texts, Poema de mio Cid, Libro de buen amor, and others through the Fifteenth Century. The transmission of medieval literature; relevant linguistic and social history; relations with Latin and Arabic cultures.

Omitted 1968-69

255. Spanish Literature of the Renaissance. From late 15th Century to about 1580. Selected poems and popular ballads, early theatre and novel are studied closely for themselves and also within the frame of cultural and historical circumstance.

256. Literature of the Later "Siglo de Oro." About 1580-1660. Selected works of such authors as Cervantes, Gongora, Quevedo, and the great dramatists are studied closely, and with reference to the changing ideas of literary expression.

Omitted 1968-69

257. Contexts of Golden Age Literature. Study, through reading, of such topics as the awareness of Antiquity; literary theory; philosophical and religious thinking; the plastic arts; 'popular' and 'learned'; the limitations and concepts of Renaissance and Baroque.

Omitted 1968-69

258. Cervantes. Detailed reading and discussion of Don Quijote and other works in relation to Cervantes' time and to the development of the novel.

275. Enlightenment and Romanticism. The history of a revolution in thought, literary style and expression, with stress on selected authors and works.

276. Modern Spanish Literature Since 1860. Special attention given to the predominance of the novel; the Generation of 1898; Modernism, the writers between the Wars. Close study of texts and evaluation of movements.

Omitted 1968-69

277. Galdós. Reading and discussion of a variety of works—novel and drama—by Pérez Galdós. Consideration of his importance in modern European literature.

291. Reading Course. Study of special literary problems under the direction of a member of the staff.

295. Senior Essay. A paper based upon independent study; required of concentrators. The paper and the advanced test of the Graduate Record Examination together comprise the senior comprehensive examination in Spanish Literature. Students should normally register for this course in the fall term of their senior year.
General Science

Committee on General Science

Michael L. Davidson, PH.D. (Berkeley) ... Assistant Professor of Psychology
Norman G. Gunderson, PH.D. (Cornell) ... Professor of Mathematics and Education
H. Lawrence Helfer, PH.D. (Chicago) ... Associate Professor of Astronomy
Lawrence W. Lundgren, Jr., PH.D. (Yale) ... Professor of Geology
William B. Muchmore, PH.D. (Washington) ... Associate Professor of Biology and Chairman of the Committee
David J. Wilson, PH.D. (California Institute of Technology) ... Professor of Chemistry

The Committee on General Science supervises a program leading to the B.A. degree which gives the student an opportunity to acquire a broad education in the sciences and at the same time to devote approximately half of his time to the study of the humanities and social sciences. The program is especially well suited for the student who wishes to prepare to teach science at the secondary school level. It is also attractive to the premedical student who wishes a broad, general preprofessional education. Students who are planning to enter medical school after only three years of undergraduate work should consider this program.

The program of concentration includes, during the entire four years, sixteen courses chosen from among the offerings in astronomy, biology, chemistry, geology, mathematics, physics, and the work in psychology which is oriented toward the natural sciences (odd-numbered courses). The concentrator in general science must take introductory courses in four or five departments. Four or more courses beyond the introductory level must be taken in one department, and two or more courses beyond the introductory level must be taken in two other departments. At least two courses must be taken in a department in order to count toward the concentration.

Because of the broad, general nature of the general science program, the requirement of the related field is met by the completion of the program described above.

Advanced placement credit may count as the introductory course requirement and as one or two of the 16 courses in the entire program. Normally, courses given in the University School are not acceptable for inclusion in a General Science Program.

Relevant sections of the Graduate Record Examination are administered as a substitute for the comprehensive examination.
The Department of Geological Sciences offers programs leading to B.A. and B.S. degrees, and at the graduate level, to M.S. and Ph.D. degrees. The B.S. program in Geology is a rigorous one designed to give students the best preparation for graduate studies and a professional career. The B.A. program is more flexible and offers students the greatest freedom in selecting courses, especially in the social sciences and humanities, while providing them with at least the minimum background for graduate studies. The B.S. in Biology-Geology is for students planning graduate studies in either Biology or Geology and emphasizes the common ground between the two.

B.A. Program in Geology

A concentration should consist of at least six and not more than eight courses in the Department beyond Geology 101. No specific courses are required except for the prerequisites in course descriptions. Students planning a concentration should obtain an adequate background in related sciences, including at least two courses beyond the introductory level. They should consult with the departmental adviser as early as possible.

The courses in geology and related sciences are arranged in such a manner as to carry the student from the introductory levels to the more advanced and highly specialized subjects in the senior year. The senior-year electives are provided to allow the student a choice of courses that can best serve his interests and special needs in graduate school.
### B.S. Program

A synopsis of the courses required in the B.S. program, term by term, follows:

#### FIRST YEAR

1. Geol. 101 Geologic Processes
2. Math. 161 Analysis I
3. English Requirement
4. Chem. 121 General Chemistry
   - or
   - Chem. 123 Inorganic Chemistry
   - Physical Education

#### SECOND YEAR

1. Elective
2. Math 163 Analysis III
3. Phys. 115 Physics I
   - or
   - Phys. 117 Physics IA
4. Elective
   - Physical Education

#### THIRD YEAR

1. Geol. 227 Optical Mineralogy & Petrology
2. Biol. elective
3. Phys. 125 Physics II
4. Math. 110 Elementary Statistics

#### FOURTH YEAR

1. Geol. 277 Paleoecology
2. Geol. 281 Introduction to Geophysics I
3. Chem. 251 Physical Chemistry I
4. Elective

*Most students can complete the foreign language requirement with one term of college work. Those who need more than one term must take the necessary courses as electives.*

*A summer course in field geology, equivalent to 6-8 credit hours, is required during the summer following the junior year.*

1. Geol. 201
2. Math. 162 Analysis II
3. Foreign Language
4. Chem. 122 General Chemistry

1. Biol. 110
2. Math. 164 Analysis IV
3. Phys. 116 Physics I
4. Geol. 224

1. Geol. 235 Stratigraphy
2. Geol. 221
3. Phys. 126 Physics II
4. Elective

1. Field Camp

1. Geol. 248 Geochemistry
2. Elective
3. Elective
4. Elective
**B.S. + M.S. Program in Biology-Geology: A 5-Year Program**

The program is appropriate for those who are inclined toward either Geology or Biology, but who wish a broader training in the natural sciences than is offered by the programs in either department.

The suggested sequence of courses for the Biology-Geology program is given below. The actual order of courses may be altered where prerequisites do not interfere. Also, some course substitutions can be made where appropriate and upon approval by the two departments.

### FIRST YEAR

<table>
<thead>
<tr>
<th>Biology Courses</th>
<th>Geology Courses</th>
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<tbody>
<tr>
<td>Geol. 101</td>
<td>Geol. 201</td>
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<tr>
<td>Chem. 121</td>
<td>Chem. 122</td>
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<tr>
<td>Group I or II</td>
<td>Biol. 130</td>
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<tr>
<td>Math. 161</td>
<td>Math. 162</td>
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### SECOND YEAR

<table>
<thead>
<tr>
<th>Biology Courses</th>
<th>Geology Courses</th>
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<tbody>
<tr>
<td>Chem. 161</td>
<td>Chem. 162</td>
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<tr>
<td>Biol. 122 or 125 (Invert. Zool. or Vert. Anat.)</td>
<td>Geol. 221 (Paleontology)</td>
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<tr>
<td>Group I or II</td>
<td>Group I or II</td>
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<tr>
<td>Math. 110</td>
<td>Quant. 235</td>
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<tr>
<td>Language</td>
<td>Language</td>
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### THIRD YEAR

<table>
<thead>
<tr>
<th>Biology Courses</th>
<th>Geology Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geol. 211 (Limnology)</td>
<td>Biol. 221 (Genetics)</td>
</tr>
<tr>
<td>Biol. 131 (Plant Kingdom)</td>
<td>Geol. 224 (Mineralogy)</td>
</tr>
<tr>
<td>Math. 163</td>
<td>Math. 164</td>
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<tr>
<td>Physics 115 or 117</td>
<td>Physics 116 or 118</td>
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<tr>
<td>Group I or II</td>
<td>Group I or II</td>
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### FOURTH YEAR

<table>
<thead>
<tr>
<th>Biology Courses</th>
<th>Geology Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physics 125 or 127</td>
<td>Geol. 235 (Stratigraphy)</td>
</tr>
<tr>
<td>Geol. 277 (Paleoecology)</td>
<td>Biol. 212 (Oceanography)</td>
</tr>
<tr>
<td>Biol. 261 (Ecology)</td>
<td>Biol. 222 (Evolution)</td>
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<tr>
<td>Group I or II</td>
<td>Group I or II</td>
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**Summer Field Course (Grad. credit)**

### FIFTH YEAR

24 hours of electives to be chosen from the following list (at least two from each department):

- Geology 248, 427, 440, 470, 474, 476, 479, 575, 578
- Biology 420, 441, 460, 465, 472, 510, 548, 561

Research—8 hours

Student at end of 2nd year has option of continuing program or electing a 4-year substitute leading to a B.S. degree. In the latter, Physics 101 and 102 is taken instead of the 4-semester sequence in Physics. Math. 163, 164 may be dropped as requirements.
101. Geologic Processes. The role of field observation, laboratory analysis and experimentation in the description and analysis of some important geologic processes; economic and ecologic implications of those processes. Lectures designed for students having little or no scientific background.—Two lectures, one discussion period, one three-hour laboratory a week.

201. Evolution of the Earth. The composition, origin and age of the earth, the dynamic history of the earth’s crust, including mountain building and continental drift, and the origins and evolution of life as revealed in the fossil record. The course is open to students with at least one course in secondary school earth science or with permission of the instructor.—Two lectures, one discussion meeting, and one laboratory a week. Field trips.

211. Introduction of Physical and Chemical Limnology. The distribution, morphology, origin and extinction of lakes. Variation of physical and chemical characteristics of lake waters and sediments with environment. The dynamics of water motion and response to the seasons. Laboratory will involve investigation of local lakes. Prerequisite: Math. 161.

212. Oceanography. A comprehensive survey of the chemistry, physics, physiography, and geology of ocean basins and sea water. Selected topics such as the physical and chemical factors which regulate growth of marine organisms, and also those related to meteorology and water pollution problems will be discussed.

221. Principles of Paleontology. Introduction to the subject by an examination of the principles of Paleontology and by a review of the invertebrate faunas of the past. Field trips. Prerequisite: Geology 101 or 201.—Two lectures, one lab a week.

224. Introductory Mineralogy. Basic principles involved in the description, classification, and genetic interpretation of minerals. Laboratory work is divided between a study of elementary crystallography and an examination of common minerals and rocks. Prerequisite: Chemistry 121 or 123.—Two lectures, one recitation, one lab a week.

227. Optical Mineralogy and Petrology. The first half of the course is concerned with polarizing microscopy and the relationships between the structure and composition of minerals and their optical properties. The second half is concerned with the study of igneous and metamorphic rocks. Prerequisites: Geology 101 or 201 and Chemistry 121 or 123.

235. Stratigraphy. Principles of stratigraphy, including the application of fundamental principles of physical geology and paleontology to problems of stratigraphy and paleography.—Three lectures and one lab a week.

248. Geochemistry. Discussion will center on the elements and their isotopes, their role in the evolution of the earth, and their use as tools in geological investigations. Prerequisites: Chemistry 121 and 122 or 123 and 124 and Physics or permission of the instructor.

252. Development of Orogenic Belts. Patterns of sedimentation, structure, tectonics, metamorphism, igneous activity and ore deposition are considered. The Scandinavian Caledonides (including Greenland) are compared with the Appalachians. Course open to senior majors and graduate students.

277. Paleocology. Environmental reconstruction based on evidence from fossils and their relations with the enclosing sediment. Emphasis on the paleocological applications of faunal distributions, adaptive morphology, and biogenic sedimentary structures. Field trips. Prerequisites: Geology 221 and Biology 101.

281. Introduction to Geophysics I. The gravity and magnetic fields of the earth. Survey of observational and theoretical seismology. Introduction to the thermal regime of the earth. Exploration geophysics and the physical properties of rocks. Prerequisites: Math. 162 or equivalent and Physics 101-102 or its equivalent.

282. Introduction to Geophysics II. Continuation of Geology 281.

286. Senior Seminar in Geobiology. A required course for all senior students in the Biology-Geology B.S. program. Papers requiring library and/or laboratory research are prepared under supervision of faculty members and presented orally before the seminar group.—One hour per week—no credit.

291. Senior Reading Course in Geology. Credit to be arranged.
Loren Baritz, Ph.D. (Wisconsin)...Professor of History
Marvin B. Becker, Ph.D. (Pennsylvania)...Professor of History
Michael Cherniavsky, Ph.D. (Berkeley)...Professor of History
John Barrett Christopher, Ph.D. (Harvard)...Professor of History
Herbert G. Gutman, Ph.D. (Wisconsin)...Professor of History and Associate Chairman of the Department
Robert B. Hall, Jr., Ph.D. (Michigan)...Professor of History and Geography
Harry Harootunian, Ph.D. (Michigan)...Professor of History
Clarence J. Karier, Ph.D. (Wisconsin)...Professor of Education and History
Ralph James Kaufmann, Ph.D. (Princeton)...Professor of History and English
Sidney Monas, Ph.D. (Harvard)...Professor of History and Russian, Director of the Center of Russian Studies
A. William Salomone, Ph.D. (Pennsylvania)...Wilson Professor of History
Perez Zagorin, Ph.D. (Harvard)...Professor of History and Chairman of the Department
Milton Berman, Ph.D. (Harvard)...Associate Professor of History
Akira Iriye, Ph.D. (Harvard)...Associate Professor of History
Dean A. Miller, Ph.D. (Rutgers)...Associate Professor of History
Mark B. Beach, Ph.D. (Wisconsin)...Assistant Professor of History and Associate Dean of the College of Arts and Science
Richard I. Cashman, M.A. (Monash)...Assistant Professor of History
Ralph C. Crozier, Ph.D. (Berkeley)...Assistant Professor of History
Robert Cuff, Ph.D. (Princeton)...Assistant Professor of History
Paul Forman, Ph.D. (Berkeley)...Assistant Professor of History
Ronald P. Formisano, Ph.D. (Wayne State)...Assistant Professor of History
James Fruguglietti, Ph.D. (Harvard)...Assistant Professor of History
Arthur Mitzman, Ph.D. (Brandeis)...Assistant Professor of History
*Nancy Struver, Ph.D. (Rochester)...Visiting Assistant Professor of History
John J. Waters, Jr., Ph.D. (Columbia)...Assistant Professor of History
Willson Havelock Coates, Ph.D. (Cornell)...Professor Emeritus of History
Arthur James May, Ph.D. (Pennsylvania)...Professor Emeritus of History
Dexter Perkins, Ph.D. (Harvard)...Professor Emeritus of History
Glyndon Garlock VanDeusen, Ph.D. (Columbia)...Professor Emeritus of History

*Part-time
The Department of History offers work leading to a concentration for the B.A. degree, to the B.A. degree in the Honors Program, and to the M.A. and Ph.D. degrees.

A program of concentration for the B.A. degree consists of a minimum of ten courses in history and a related field. All students applying for admission to the department must have taken at least two courses in history, preferably at the 100 level, in which they received a grade of C or better. These courses, however, will not count towards the number required for concentration. Six to eight of the ten courses should be in history beyond the 104 level. However a student may not count more than two 100 level courses as part of the concentration. Thus, the concentration must include a minimum of four 200 level history courses.

A student will be expected to add to his work in History enough additional courses to bring the total in his concentration to ten. The related field may be chosen from among the following: Anthropology, Comparative Literature, Economics, English, Fine Arts, Foreign Languages, Philosophy, Political Science. A student interested in a related field not listed above should consult his departmental adviser. All courses in the related field should lie beyond the introductory level, except that a student who elects to study a second foreign language will be permitted to include the first year course in that language.

All history courses are open to freshmen unless specifically designated otherwise. However, freshmen are urged to take 100 level courses.

Qualified History concentrators will be approved by the department for the junior year abroad.

No courses at the 200 level carry credit for graduate students in History.

I. Introductory Courses

111. Hellenic Civilization. A study of the main lines of Greek development from Minoan times to the end of the Peloponnesian Wars. Omitted 1968-69

112. Roman Civilization. A study of Roman culture and society from the foundation of the city of Rome to the foundation of Constantinople.

121. British History to 1485. A historical survey of the development of British civilization from its beginnings to 1485 with the emphasis on England. Omitted 1968-69

131. The History of the United States I. A general history of the United States from Colonial times to the Civil War.

132. The History of the United States II. A general history of the United States from the Civil War to the present.

151. Early Modern Europe. A survey of some major features of the development of the Western European states and society during the period from the later 16th to the beginning of the 18th century. Omitted 1968-69

152. The Old Regime and the Enlightenment. A study of the political, economic, social, religious, and cultural life of Europe from the death of Louis XIV to the eve of the French Revolution.

II. History and Geography Sequence

176. History of the Scientific Life. This is not a history of scientific theories and discoveries, but rather a history of the activity called "doing science" and of the life styles of those who have engaged in such activities from antiquity to the present.

180. Introduction to East Asian History. A topical survey of East Asian history stressing the formation of the Chinese cultural area, its influence on surrounding countries, the rise of a distinctive Japanese civilization, and the differing responses of China and Japan to the challenge of modernization.


182. Historical Geography. A survey of the historical geography of the North American continent. Emphasis will be on changing settlement patterns and the development of urban centers. Omitted 1968-69

183. European Industrialization. A survey of the development of contemporary patterns of land use and population distribution and the changing utilization of resources in Europe. Emphasis will be on the processes of industrialization and urbanization.

186. South and Southeast Asia Modernization. A survey of the development of contemporary patterns of land use, population distribution, and the development of resources in South and Southeast Asia. Emphasis will be on the problems of population growth and the processes of modernization. Omitted 1968-69

III. General Courses

A. Ancient to Renaissance Sequence

204. Greek Intellectual History. An exploration of the origin, rationale, course of development, and interrelationship of the fundamental ideas of Greek thought from Homer to Aristotle.

205. Hellenistic and Imperial Civilization. A study of the changing aspects of the world from the early fourth century B.C. to the third century A.D.

207. Byzantine Empire. History of Byzantium from 330 to 1453, including a consideration of the Islamic world and the early medieval Slavic states. Omitted 1968-69


209. The Byzantine Imperial City. Constantinople as a social, economic, administrative phenomenon; the "imperial" city as a type, and its effect on history. Omitted 1968-69

215. Italy in the Middle Ages. This course will involve a study of Italian culture and institutions from the coronation of Charlemagne to the age of Dante. Omitted 1968-69

217. The Medieval Synthesis. A study of Western European civilization from ca. 1200 to ca. 1350. Omitted 1968-69

218. The Italian Renaissance. A study of Italian cultural life from ca. 1300 to ca. 1550. Omitted 1968-69

219. The Northern Renaissance and the Reformation. A study of the cultural history of Northern Europe from the fourteenth to the late sixteenth century.

B. British Sequence


225. England Since Waterloo. Study of the period of England’s world supremacy in the mid and late 19th century, and of her complex adjustments to a lesser role in the 20th century. Omitted 1968-69


C. American Sequence

228. Colonial Latin American Culture. A study emphasizing the high cultures of Peru and Mexico in the native and viceroyal areas. Omitted 1968-69


233. The Early National Era. A study of the crucial era from Jefferson to the Monroe Doctrine.

234. The Jacksonian Era, 1824-1850. Political and social developments underlying and accompanying westward expansion, sectional conflict, and growing economic sophistication.

235. Civil War and Reconstruction, 1850-1877. The coming of the war, its political and social effects, and the short-run and long-term results of the postwar reshaping of the nation. Omitted 1968-69


241. American Industrialization and American Society I. An examination of the ways in which industrialization has affected traditional American society in the mid 19th century. Political, social, cultural, and even diplomatic history are studied primarily as responses to changes in the American social and economic structure. Omitted 1968-69

242. American Industrialization and American Society II. An extension of the enquiry begun in History 241 up to the beginning of World War I.

243. American Social History I. The development of American society and culture from the seventeenth century to the Civil War. Omitted 1968-69

244. American Social History II. The development of American society and culture from the Civil War to the present. Omitted 1968-69

245. American Intellectual History I. The American mind from colonial times to the end of the Civil War. Omitted 1968-69

246. American Intellectual History II. The American mind from Civil War to the present. Omitted 1968-69

247. Religion in American Society. The impact of religion on life in America, and the adaptation of religion to a changing American society, from the Puritans to the present. The course will deal with religion primarily as a social phenomenon. Omitted 1968-69

248. United States’ Emergence as a World Power. A survey of United States foreign relations from the eighteenth century to the outbreak of World War I with emphasis on changing United States views of the external world and the effect of United States’ emergence as a great power upon the policies of other governments.
249. The United States in World Politics. America's foreign relations since World War I. The topics covered will include Wilsonian diplomacy, the Siberian expedition, isolationism of the 20's and 30's, changes in the Monroe Doctrine, World War II, the cold war in Europe, and the evolution of a China policy. American policy will be analyzed both in relation to the domestic determinants of policy and to conditions outside the United States.

250. Culture and Society in Twentieth-Century America. An analysis of the cultures of affluence and poverty in recent and contemporary America, including the growth of technology, aspects of Negro culture, developments in foreign policy, popular culture, and literary responses to social change.

D. Modern European Sequence

252. The Age of Revolution, 1789-1848. 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.


254. France Since 1870. Economic, political, diplomatic, imperial, and cultural developments, concluding with an estimate of the changes resulting from World War II.

255. Europe in the Liberal Era. Analytical studies of European history from the close of the epoch of traditional statesman-making to the opening of the age of world wars and revolutions. Emphasis will be placed on the inter-European character of the larger political, diplomatic, social, economic, and cultural problems of the period.

256. Europe in the Twentieth Century. An historical analysis of Europe's era of crises, world wars, and revolutions. Emphasis will be placed upon the origin and impact of the two great European wars of the twentieth century with a view to elucidating the dual transformation of Europe from hegemony to potential "third force" and from nationalism through totalitarianism to an emergent European Community.

259. History of Italy from the Renaissance to the Risorgimento. A study of the origins, character, and significance of modern Italian civilization conducted through historical analysis of major expressions during the eras of the Renaissance, the Baroque, and the Enlightenment.

260. History of Italy from the Risorgimento to the Present. A study of Italian history during the nineteenth and twentieth centuries which emphasizes the rise, rule, and decline of the Liberal State.

261. History of Germany from the Reformation to Bismarck. An analysis of social, political and intellectual currents in Germany.

262. History of Germany from 1890 to 1945. An examination of the social, political and intellectual trends in Germany from 1890-1945.

264. Comparative Medieval History. Feudalism, Christian modes, architectural styles, legal systems from the 7th through the 12th centuries transculturally considered from England to Kiev and Byzantium. Omitted 1968-69

265. History of Russia I. History of Russia from the earliest times to Peter I. Stress placed on the origins and development of characteristic Russian political, social and economic institutions.

266. History of Russia II. History of Russia from Peter I to the present.

267. Russian Intellectual History. A consideration of the main themes of Russian intellectual history in the 19th and 20th centuries.

268. History of the USSR. The Bolshevik Revolution and its aftermath; emphasis on origins and development of economic, political, social, and cultural institutions.

269. Totalitarianism. The background and development of totalitarian movements in the twentieth century, with special emphasis on Soviet Russia and Nazi Germany.

270. The Russian Revolution, 1900-1922. An examination of the pre-revolutionary period in Russian social, political, economic, and intellectual developments; analysis of the relevant sources; the history of the outbreak and course of the Revolution and the Civil War that ensued.

271. Intellectual History of Modern Europe I. A reading course in the history of western thought from ca. 1300 to 1750.

272. Intellectual History of Modern Europe II. A continuation of History 271, dealing with the period from ca. 1750 to the present. History 271 is not prerequisite for this course.

274. Philosophy of History and Historiography. A survey of the main conceptions of historical change, process, explanation, and representation from Herodotus to Toynbee. Not open to freshmen. Omitted 1968-69

275. Technology and Society. An analytical course for advanced undergraduate students exploring the social theories and practical techniques for organizing the work and leisure of contemporary mass society.

276. History of Science I. Natural philosophy and the exact sciences from antiquity to Newton.

277. History of Science II. Physical theory and the structure of matter from Newton to Bohr.

278. Cultural History. A wide range, comparative investigation of major periods of cultural vitality.

E. The Asian Sequence

279. The Making of Traditional India. A topical survey of cultures and institutions on the sub-continent stressing the essential continuity between ancient and contemporary India.

Omitted 1968-69
280. **History of Modern India.** Contemporary India and Pakistan emphasizing cultural, social, and political changes generated by the coming of Europeans.

281. **History of China to 1600.** The formation of a distinctively Chinese culture area and its political unification. Disintegration and reunification of the centralized empire, with the evolution of the political, social, and cultural forms which characterized early modern China.

Omitted 1968-69

282. **History of China Since 1600.** The mature imperial system in its social and cultural setting. Collapse of the traditional order under the impact of the industrialized West, and the process of China's modern revolution.

Omitted 1968-69

283. **History of Chinese Communism.** The appeal of Marxist-Leninism in twentieth century China and its adaptation to meet Chinese needs. The Maoist revolutionary approach to modernization of China, and its use as model for other Asian societies.

284. **History of Japan to 1800.** A survey of Japanese institutions and culture before modernization.

Omitted 1968-69

285. **Japan Since 1800.** An historical analysis of the economic, political, social, and cultural forces which contributed to Japan's emergence as a modern state.

Omitted 1968-69

286. **Intellectual History of Modern East Asia.** The development of Chinese and Japanese thought from the 18th century to the present. This course is conducted as a discussion group.

Omitted 1968-69

287. **East Asian Economic History and Demography.** A survey of the patterns of contemporary land use, population distribution and the development of resources in East Asia. Emphasis will be on the problems of population growth and processes of modernization.

Omitted 1968-69

288. **Islamic Culture.** A survey of traditional Muslim institutions, stressing art and literature as well as religion, politics, and society, and focused on the medieval caliphates and on Persia and the Ottoman Empire in early modern times.

289. **The Middle East in Modern Times.** Rapid survey of the background before 1800; emphasis on the growth of Turkish and Arab nationalism; the strategic importance of the Middle East, and the record of attempts to modernize and "Westernize" the Middle Eastern states.

290. **South Asian Intellectual History.** Dominant ideas in the formation of Indian Civilization; the role of the intellectual in Indian Society.

F. Special

291. **Reading Course in History.**

295. **Senior Independent Work.**

296. **Senior Seminar.**

G. Honors

Effective with the class of 1970, optionally with that of 1969, an experimental Honors program will be offered by the Department of History. It is designed to permit concentrators to participate in seminars and also to write the Honors essay required for the degree with Honors in History. The Department expects that this program will attract concentrators who would have been candidates for Distinction in the past; it therefore plans to suspend recommendations for degrees with Distinction after 1969 and recommend students only for degrees with Honors.

Honors concentrators in History fulfill the usual requirements for concentration (at least 40 hours in History and an allied field) and the following specific requirements: Satisfactory work in at least two History Honors seminars, one of which must be taken before the Senior year (these seminars count toward the 40-hour concentration requirement). Satisfactory completion of the first seminar is required for a student to continue as an Honors candidate. Production of an Honors essay of high quality of thought and composition, approximately 35 pages in length, and meeting other requirements the faculty supervisor may set. The essay will be evaluated by a second reader, either from this faculty or from outside. It may be written in conjunction with a regular Honors seminar and under the supervision of the instructor of that seminar; or it may be written in conjunction with History 395.
The administration of these requirements is supervised by a departmental Honors committee, which recommends students for admission to the program, reviews their progress, and makes recommendations for the level of Honors to be awarded at commencement.

319. Renaissance and Reformation. Transition of European civilization from the later Middle Ages to modern times. Omitted 1968-69

322. Seventeenth Century. Seventeenth century history, primarily in England; political, economic, social, intellectual, and religious aspects. Omitted 1968-69


333. American Politics and Society. The myth of "Jacksonian Democracy"; reform movements and their relations to politics; abolition and anti-slavery; the free negro in the age of egalitarianism; the frontier and the structure of society.


341. Nineteenth Century American Reform Movements. The sources, activities, and achievements of political and religious dissenters and uplifters from the Loco-focos of the 1830's to the Populists of the 1890's. Omitted 1968-69


346. American Intellectual History. The development of American thought since the Civil War, with emphasis on theories of political economy, philosophy, and literature.


351. Europe in the 18th and Early 19th Centuries. European history, 1715-1815, with particular stress on the shifting balance of power, the evolution of arts and letters, the Enlightenment, and the era of the French Revolution and Napoleon. Omitted 1968-69


355. European Civilization in the Liberal Period. Historical studies conducted through topical analyses of the political and social foundations and of the intellectual and cultural vicissitudes of Western Europe during the height of the last classic era of European hegemony, 1880-1910. Omitted 1968-69

367. Russian Intellectual History. A consideration of the main themes of Russian intellectual history in the 19th and 20th centuries. Omitted 1968-69


369. Mass Society and Totalitarianism. Totalitarianism and estrangement in the twentieth century as related to changes in industrial society; the confrontation of mass society theories with historical evidence, especially the German case. Reading knowledge of German helpful. (Also listed under Sociology 315.) Omitted 1968-69


377. The Scientific Revolution, 1500-1700. Study of the construction of new principles and methods in natural philosophy and a new world system, looking at such key figures as Copernicus, Vesalius, Kepler, Galileo, Harvey, Bacon, Descartes, Huygens, and Newton. Omitted 1968-69

380. Comparative History. A study of selected topics in the comparative history of social and governmental institutions, major trends of economy and society, and recurrent phenomena of civilization. Omitted 1968-69

382. History of East Asia in Modern Times (China). Social, political, and intellectual development of China in the last one hundred years.

386. History of East Asia in Modern Times (Japan). Evolution of Japan as a modern state, with special emphasis on those forces which contributed to Japan's successful response to the West. Omitted 1968-69

388. Urban-Industrial Japan. The evolution of Japan from an agricultural to the first urban-industrial nation in Asia, emphasis on changing patterns of land use and the formation and growth of the metropolitan areas.

390. The Modern Middle East. Rapid survey of the historical background, with stress on the period since 1800. Particular attention is given to the genesis of Turkish and Arab nationalism, to the problems of economic development, and to the changing relations between the Middle Eastern states and the Western powers.

395. Honors Research. Supervision of students undertaking special research projects.
The Department of Languages and Linguistics offers courses in Chinese, French, German, Greek, Hindi, Italian, Japanese, Latin, Russian, Sanskrit, and Spanish as well as in Linguistics. It offers concentration toward the B.A. degree in Linguistics, French, German, Russian, and Spanish; toward the M.A. degree in Linguistics, French, German, and Spanish; and toward the Ph.D. degree in General Linguistics.

For the B.A. degree in French, German, Russian or Spanish, a student's program of concentration will consist of six to eight courses beyond the Intermediate course (104). In consultation with the departmental adviser for the language in question, the student will plan a program with emphasis on language but including at least the Survey of Literature courses (131 and 132) given by the Department of Foreign and Comparative Literature and at least the Introductory course in Linguistics 201. Allied courses bring the total to ten.

For the B.A. degree in Linguistics, a student's program of concentration will consist of six to eight courses in Linguistics, including 201 (the prerequisite for all other courses in Linguistics), and 202, 203, 204. Courses in Foreign Languages, Literature, Anthropology, Mathematics, Philosophy or Psychology are accepted as allied material to complete the ten-course concentration. The B.A. degree requires Senior Comprehensive examinations, consisting a) of a written essay on a restricted topic, 20-30 pages in length, in English, b) of an oral examination, on the broader area of Linguistics.

The facilities of five established laboratories are used in the training of students: the Verbal Behavior Laboratory, the Acoustic Phonetics Laboratory, the General Laboratory of Linguistics, the Programmed Learning Studio and the Language Services Center.

The Department encourages the Junior Year Abroad for qualified students of French, German and Spanish, and has regular exchange agreements with institutions in France and Germany.

NOTE: Courses numbered 101-104 in Chinese, French, German, Hindi, Italian, Japanese, Russian and Spanish will have five class hours and three laboratories a week.
CHINESE


103. Intermediate Chinese I. Continuing study of modern Chinese in its spoken and written forms. Reading of graded texts in Chinese script. Prerequisite: Chinese 102 or equivalent.


105. Readings in Modern Chinese Prose. Practice in reading selected short prose works as preparation for the use of Chinese as a research tool in the humanities and social sciences. Prerequisite: Chinese 103 or equivalent.

221. Chinese Conversation I. Practice in understanding and speaking modern mandarin Chinese; attention to Chinese grammar. Prerequisite: Chinese 104 or equivalent.

222. Chinese Conversation II. Continuation of Chinese 221.

291. Reading Courses in Chinese Language.

FRENCH


103. Intermediate French I. Continuing study of modern French in its spoken and written forms. Prerequisite: French 102 or equivalent.


121. French Conversation and Composition. Advanced study of structure and usage and examination of problems of translation. Expository writing; prepared and extemporaneous speaking. Prerequisite: French 104 or equivalent. Required of French Majors.

211. The Linguistic Structure of French. Synchronic analysis of the phonemic, morphological, syntactic, and semantic systems of present-day French; reference to dialectal variations. Prerequisites: French 121 or equivalent and Linguistics 201, or permission of instructor. Required of French Majors.

212. French Dialectology. Study of the dialectal variations of the French language both in their geographical and social dimensions. Prerequisites: French 211 or permission of instructor.

235. History of the French Language. Diachronic analysis of French as one of the Romance Languages: its formation, development, and present state. Examination of selected texts. Prerequisites: French 121 or equivalent and Linguistics 201, or permission of instructor. Required of French Majors.

291. Reading Course in French Language.

GERMAN

101. Elementary German I. Introductory training in the structure of modern German and its basic vocabulary. Practice in speaking; reading of selected graded texts.

102. Elementary German II. A continuation of German 101.

103. Intermediate German I. Continuing study of modern German in its spoken and written forms. Prerequisite: German 102 or equivalent.

104. Intermediate German II. A continuation of German 103.

105. German Specialized and Technical Reading. Controlled readings in specialized and technical prose as a preparation for use of the language in fields of the student's interest. Prerequisite: German 103 or equivalent.

121. German Conversation and Composition. Advanced study of structure and usage; examination of problems of translation. Expository writing; prepared and extemporaneous speaking. Prerequisites: German 104 or equivalent. Required of German Majors.

211. The Linguistic Structure of German. Synchronic analysis of the phonemic, morphological, syntactic, and semantic systems of present-day German; dialectal variations. Prerequisites: German 121 or equivalent and Linguistics 201, or permission of instructor. Required of German Majors.
212. German Dialects. An examination of the growth and development of the German language area of Central Europe: Germany, Austria, Switzerland, and the bordering regions in which dialect forms of German are spoken. Prerequisite: German 211, or permission of instructor.

221. Advanced Language Skills I. An intensive investigation and training in the nature and use of German.

222. Advanced Language Skills II. A continuation of 221. Omitted 1968-69

235. History of The German Language to 1500. Diachronic analysis of German as one of the Germanic languages; its formation and development to 1500. Examination of selected texts from the earliest period to 1500 illustrating the development of German. Prerequisites: German 121 or equivalent and Linguistics 201, or permission of instructor. Required of German Majors.

236. History of The German Language from 1500. A continuation of German 235, covering the period from 1500 to the present.

241. Practicum in German. Investigation of special problems in German.

291. Reading Course in German Language.

GREEK

101. Elementary Greek I. Introductory training in the structure of Greek and its basic vocabulary. Reading of selected graded texts.

102. Elementary Greek II. A continuation of Greek 101.

HINDI

101. Elementary Hindi I. Intensive study of basic vocabulary and structure of modern Hindi for rapid development of speaking, listening and reading skills. Prerequisite: fulfillment of foreign language requirement.


103. Intermediate Hindi I. Continuing study of current Hindi structure, usage, and vocabulary. Practice in expository writing and in speaking, to increase fluent active command of the language; problems of translation. Prerequisite: Hindi 101 or equivalent.


105. Hindi Reading. Controlled readings in general prose as a preparation for further work with the written language. Prerequisite, Hindi 103 or equivalent.

ITALIAN

101. Elementary Italian I. Introductory training in the structure of modern Italian and its basic vocabulary. Practice in speaking; reading of selected graded texts.

102. Elementary Italian II. A continuation of Italian 101.

103. Intermediate Italian I. Continuing study of modern Italian in its spoken and written forms. Prerequisite: Italian 102 or equivalent.

104. Intermediate Italian II. A continuation of Italian 103.

JAPANESE


103. Intermediate Japanese I. Reading of a variety of texts with emphasis on comprehension; practice in speaking. Prerequisite: Japanese 102 or equivalent.


204. Japanese Reading I. Reading of a variety of texts with emphasis on comprehension. Prerequisite: Japanese 104 or equivalent. Omitted 1968-69

205. Japanese Reading II. Continuation of Japanese 204. Prerequisite: Japanese 205 or permission of the instructor. Omitted 1968-69

211. The Linguistic Structure of Japanese. Synchronic analysis of the phonemic, morphological, syntactic, and semantic systems of present-day Japanese. Prerequisites: Japanese 104 and Linguistics 201, or permission of the instructor. Omitted 1968-69

235. History of the Japanese Language. Diachronic analysis of Japanese, with consideration of the problem of its origin. The development of Japanese considered in relation to social history; the importation and development of the writing system. Prerequisites: Japanese 104 and Linguistics 201, or permission of the instructor. Omitted 1968-69

291. Reading Course in Japanese Language.
LATIN


RUSSIAN

101. Elementary Russian I. Introductory training in the structure of modern Russian and its basic vocabulary. Practice in speaking; reading of selected graded texts.

102. Elementary Russian II. A continuation of Russian 101.

103. Intermediate Russian I. Continuing study of modern Russian in its spoken and written forms. Prerequisite: Russian 102 or equivalent.

104. Intermediate Russian II. A continuation of Russian 103.

105. Russian Reading and Translation. Controlled readings in fields of the student’s interests. Prerequisite: Russian 103 or equivalent.

121. Russian Conversation and Composition. Advanced study of structure and usage; examination of problems of translation. Expository writing; prepared and extemporaneous speaking. Emphasis on diction, effectiveness, levels of speech, and style. Prerequisite: Russian 104 or equivalent. Required of Russian Majors. Omitted 1968-69

211. The Linguistic Structure of Russian. Synchronic analysis of the phonemic, morphological, syntactic, and semantic systems of present-day Russian; dialectal variations. Prerequisites: Russian 121 or equivalent and Linguistics 201, or permission of instructor. Required of Russian Majors.

221. Advanced Language Skills I. An intensive investigation and training in the nature and use of Russian. Omitted 1968-69

222. Advanced Language Skills II. A continuation of 221. Omitted 1968-69

231. Old Church Slavic. A descriptive study of the structure of Old Church Slavic. Analysis of texts. Prerequisite: proficiency in one Slavic language, or permission of the instructor.


233. History of the Russian Language. Diachronic analysis of Russian as one of the Slavic languages; its formation, development and present state. Examination of selected texts from the earliest period to modern times illustrating the development of Russian. Prerequisites: Russian 121 or equivalent and Linguistics 201, or permission of instructor. Required of Russian Majors.


291. Reading Course in Russian Language.

SANSKRIT

231. Sanskrit I. Elements of the grammar of the classical language. Special attention to sandhi, the devanagari script, and the place of Sanskrit in the civilization of India.

232. Sanskrit II. Further study of Sanskrit grammar. Stress on the analysis of nominal composition and the acquisition of vocabulary. Prerequisite: permission of instructor.

SPANISH

101. Elementary Spanish I. Intensive training in speaking, comprehension, reading, and writing through the use of programmed learning materials, presented on tape and in workbooks. Students work independently under supervision and also participate in periodic meetings with the instructional staff. Omitted 1968-69

102. Elementary Spanish II. Skills acquired in Spanish 101 are maintained in audio-lingual classroom instruction. Reading and writing are emphasized.

103. Intermediate Spanish I. Continuing study of modern Spanish in its spoken and written forms. Prerequisite: Spanish 102 or equivalent.

104. Intermediate Spanish II. A continuation of Spanish 103.

121. Conversation and Composition. Advanced study of structure and usage; examination of problems in translation. Expository writing; prepared and extemporaneous speaking. Emphasis on diction, effectiveness, levels of speech, and style. Prerequisite: Spanish 104 or equivalent. Required of Spanish Majors.
211. The Linguistic Structure of Spanish. Synchronic analysis of the phonemic, morphological, syntactic, and semantic systems of present-day Spanish; dialectal variations. Prerequisites: Spanish 121 or equivalent and Linguistics 201, or permission of instructor. Required of Spanish Majors.

212. American Spanish. A study of the dialectal variations of Latin American Spanish: phonology, syntax, semantics. Prerequisites: Spanish 121 and Linguistics 201, or permission of instructor.

221. Advanced Language Skills I. An intensive investigation and training in the nature and use of Spanish.

222. Advanced Language Skills II. A continuation of 221.

235. History of the Spanish Language. Diachronic analysis of Spanish as one of the Romance languages; its formation, development, and present state. Examination of selected texts from the earliest period to modern times. Prerequisites: Spanish 121 or equivalent and Linguistics 201, or permission of instructor. Required of Spanish Majors.


291. Reading Course in Spanish Language.

LINGUISTICS

201. Introduction to Linguistics. Principles of structural analysis of speech phenomena. Examination of material from a wide variety of languages.

202. Introduction to Historical Linguistics. A diachronic study of the phases and processes of linguistic change: phonological, grammatical and semantic. Prerequisite: Linguistics 201, or permission of instructor.


205. Applied Linguistics for Language Teachers. Introduction to principles of linguistic analysis and their effective application in second-language teaching.

211. The Structure of Modern English. An examination of the phonological, grammatical, and semantic structures of modern English, employing the methods of modern linguistics. Related areas such as dialect variation, stylistics, and usage will be considered. Prerequisite: Permission of instructor. Recommended: Linguistics 201 or English 200.

215. Descriptive Analysis I: Phonology. Consideration of the phonemic principle and development of skills in the description of the sound systems of language. Prerequisites: Linguistics 201 and Linguistics 203, or permission of instructor.

216. Descriptive Analysis II: Morphology and Syntax. Procedures of morphemic analysis and syntactic description and development of skills in the description of grammatical systems. Prerequisite: Linguistics 215, or permission of instructor.

217. Informant Work. Intensive study in the transcription and analysis of an unknown language from speech. Elements of phonological, morphological and syntactical analysis and presentation. Prerequisites: Linguistics 216, or permission of instructor.

237. Introduction to Romance Linguistics. Comparative study of the development of the principal Romance Languages from their Latin origins. Prerequisite: Concentration in one of the Romance languages or equivalent.

240. Provencal. The linguistic structure of Old Provencal. Extensive readings. Prerequisite: French 235 or Linguistics 237, or permission of instructor.


250. Acoustic Phonetics. Introduction to the structure of the speech wave, problems of acoustical and linguistic speech segmentation, and perceptual relationship between acoustic features and linguistic units. Practical experience in laboratory phonetics. Prerequisite: Linguistics 201 and 203, or permission of instructor.

291. Reading Course in Linguistics.

See English 200. History of English Language.

See English 201. Introduction to Old English.

Honors Work: Each Honors student will plan a program individually tailored to his needs, having the option of concentrating on individual research projects, taking special Honors seminars, and enrolling in graduate seminars, in addition to the regular undergraduate courses. Students seeking admission to the Honors program should apply to the Department.


323. Psycholinguistics. Topics selected from psycholinguistics: child language development, foreign language learning, information processing, speech pathologies, and research methods. Omitted 1968-69

324. Topics in Contemporary Analysis. Emphasis will be on problems in linguistic theory.

391. Reading Course.

395. Research Course.
The Department of Mathematics offers the B.A., M.A., and Ph.D.

Undergraduate majors are limited to students who do well in Mathematics 161-164 or 171-174. The first of these is the standard sequence in analysis; it may be entered with advanced standing. The second is an accelerated sequence covering the standard material more deeply and with additional theoretical work.

A concentration consists of ten courses. Six to eight are mathematics courses numbered 200 or higher. The rest are nonintroductory electives in related subjects. The program must be approved by the mathematics departmental advisor.

The B.A. requires Mathematics 236, 237, 265 and 266. To earn Distinction, the student must present additional advanced work of high quality.

There is considerable flexibility in mathematics electives. All students planning graduate work in mathematics are urged to take at least two courses from among Mathematics 243, 247, 255,
267, 268, and 275; they should also study two of the languages: French, German, Russian. Mathematics majors planning a career in industry are advised to consider Mathematics 200, 207, 263, 267, 268, and 280; those planning to teach in the secondary schools should consider Mathematics 200, 230, 250 or 253.

Mathematics 261, 262, and 263 are recommended for majors in the natural sciences and engineering. Mathematics 100 is appropriate for majors in management and social sciences. Mathematics 140 is intended primarily for students planning to teach in the elementary school or in a non-science area at the secondary school level. Mathematics 100, 130, and 150 are recommended electives for students in the liberal arts.

100. Finite Mathematics. Logic and the algebra of sets; partitions, combinatorial probability; vectors and matrices; linear programming and the theory of games.

130. Mathematical Snapshots. Prime numbers, rationals, complex numbers; traveling salesman problems; memory wheels; algebraic systems; Latin squares; map coloring; finite mathematics. The real numbers, rationals, complex numbers; traveling salesman problems; memory wheels; algebraic systems; Latin squares; map coloring; infinite sets.

140. Topics in Elementary Mathematics. The real number system and its subsystems. Sets and relations. Topics in geometry. Intended primarily for the student planning to teach in the elementary school or in a non-science area at the secondary school level. Cannot be used to satisfy any distributional requirements.


161. Analysis I. Equations of the line; sets, functions; limits; derivatives; conic sections; the definite integral.

162. Analysis II. Integration; solid analytic geometry; series; vector analysis. Prerequisite: Math. 161.

163. Analysis III. Multiple integrals; partial derivatives; differential equations. Prerequisite: Math. 162.

164. Analysis IV. Further topics in differential equations; linear algebra. Prerequisite: Math. 163.


200. Probability. Random variables; binomial, Poisson, and normal distributions; mathematical expectation, law of large numbers; central limit theorem; Markov chains. Prerequisite: Math. 162.

203. Denumerable Markov Chains. Their definition and classification; properties of transient and recurrent chains; interpretation of potential theory concepts, and derivation of the classical potential principles; applications. Prerequisites: Math. 200 and Math. 265.

207. Linear Programming and the Theory of Games. The basic properties of convex sets. The linear programming problem and its dual. Principal theorems; applications, in particular to finite games. Some infinite games. Prerequisite: Math. 164.

220. Mathematical Logic. Propositional calculus, functional calculus of first and higher order, the decision problem, consistency, completeness. (Philosophy 216 may be substituted for Mathematics 220 whenever the latter is not offered.)

230. Theory of Numbers. Divisibility, primes; congruences; Euler's $\phi$-function; quadratic residues and quadratic reciprocity; algebraic integers.


236. Introduction to Algebra I. An introduction to basic algebraic structures: groups, rings, fields. Application to specific examples; the integers, the rational numbers, the real numbers, polynomial rings, permutation groups.

237. Introduction to Algebra II. Linear algebra from an algebraic standpoint; field extensions. Prerequisite: Math. 236.

243. Introduction to Algebraic Topology. Classification of surfaces, knot theory, the fundamental group. Prerequisites: Math. 230 and Math. 265.

247. Theory of Sets. Sets, relations, mappings; equivalence, order; cardinals, ordinals, transfinite arithmetic; axioms of choice and equivalents.


250. Higher Geometry. Foundations of geometry; symmetry, similarity, inversions; introduction to affine, projective, and various non-Euclidean geometries.

253. Projective Geometry. Projective and affine planes, Desargues' Theorem, Pappus' Theorem, the cross ratio, collineations, introduction of coordinates, conics, Pascal's Theorem, duality.


262. Advanced Calculus II. Distributions. Introduction to the calculus of variations and complex analysis: Cauchy's integral theorem, conformal mapping, calculus of residues, etc. Prerequisite: Math. 261.

265. Functions of a Real Variable I. Real number system; uniform continuity; mean value theorems; bounded variation; Riemann-Stieltjes integral; sequences of functions. Prerequisite: Math. 163.

266. Functions of a Real Variable II. Differentials; implicit functions, functional dependence; transformations of multiple integrals; arc length, surface area; differential forms, vector analysis. Prerequisite: Math. 265.


268. Orthogonal Functions and Fourier Series. Orthogonal functions. Sturm-Liouville equations; integral operators, Dirichlet kernel, Fourier series, Gibbs phenomenon; generalized functions; Legendre polynomials, Bessel functions; heat and temperature, harmonic functions, waves and vibrations; Fourier integral. Prerequisite: Math. 265 or 267. Omitted 1968-69


291. Reading Course in Mathematics. Special work, arranged individually. Consent of the department chairman required.

436. Abstract Algebra I. Basic algebraic structures, including semi-groups, groups, rings, fields, vector spaces, modules, linear algebras, lattices.

437. Abstract Algebra II. Rings of endomorphisms of abelian groups, multilinear algebras, exterior algebras, Galois theory. Prerequisite: Math. 436.


466. Global Analysis. The derivative as a linear mapping, inverse and implicit function theorems, integration of differential forms. Differentiable manifolds, tangent and cotangent bundles, De Rham theory. Prerequisite: Math. 443, 437, 471.


A Bachelor of Arts program with a concentration in music is offered by the College of Arts and Science in cooperation with the Eastman School of Music. Students planning to pursue the Bachelor of Arts degree in music must be auditioned and accepted by the Eastman School of Music.

Practice facilities are available on the River Campus to all students who are enrolled in applied music. Practice rooms supplied with pianos are located in the Women's Gymnasium and the Men's Dining Center. Students enrolled in degree courses in music are charged a practice room fee for the opportunity given to them to reserve practice facilities.

In addition to fulfilling the requirements for the Bachelor of Arts degree, students are required to take sixteen courses in music. A synopsis of a typical program is given below.

Students interested in being certified to teach music in New York State in addition to receiving the B.A. degree with a major in music can follow a slightly modified program which will include an overload for four semesters or two extra summers. It is necessary to plan this program during the freshman year with the advice of the Director of Music for the River Campus.

With instructor's permission, music concentrators may enroll in any course listed in the Official Bulletin of The Eastman School of Music.

**FIRST YEAR**
1. Applied Music
2. 101 Theory
3. English Requirement
4. Group III (Lab)
   - Physical Education

**SECOND YEAR**
1. Applied Music
2. 111 Theory
3. Group II
4. Group III
   - Physical Education

**THIRD YEAR**
1. Applied Music
2. Music Elective
3. Group II
4. Elective (College of Arts and Science)

**FOURTH YEAR**
1. Applied Music
2. Music Elective
3. Elective (College of Arts and Science)
4. Elective (College of Arts and Science)
Courses offered by the College of Arts and Science

The courses listed below are not open to students who are concentrating in music.


**Music 103. Introduction to the Literature of Music I.** This course and its sequel, Music 104, aim to introduce the student to the subject of Western music through analysis of selected masterpieces of that art. It is devoted to the development of music from early Christian times until 1830 with special attention being given to the Renaissance, Baroque and Classical periods in their relationship to the cultural and social forces of the times. A knowledge of the fundamentals of music is prerequisite.

**Music 104. Introduction to the Literature of Music II.** Development of music during the Romantic and Modern periods. Correlation between music and the other arts is given special consideration. A knowledge of the fundamentals of music is prerequisite.

**Music 201. Studies in Contemporary Sound.** Scientific aspects of tone production, and the study of contemporary musical trends. Creative projects and papers. A knowledge of music fundamentals is prerequisite. No graduate credit.

Courses offered by the Eastman School of Music

The courses listed below are open to all students of the College of Arts and Science as electives with the approval of the Director of Music on the River Campus and the permission of the instructor.

Courses taught at the Eastman School of Music

Courses listed below may be taken at the Eastman School of Music. Credit will be awarded according to the system used at the Eastman School of Music (four credit hours being equivalent to one course in the College of Arts and Science). However, for students who are not concentrating in music, the first two 3 credit courses are given full course credit; music concentrators receive full course credit for four 3 credit courses.

**Theory 131. Styles I.** Technical analysis of works of the late eighteenth- and nineteenth-century composers with written assignments in the styles under consideration. Prerequisite: Theory 112.-3 credit hours.

**Theory 132. Styles II.** Continuation of Theory 131. Styles of twentieth-century American and European composers. Prerequisite: Theory 131.-3 credit hours.

**Counterpoint 101. Modal Counterpoint I.** Modal counterpoint of the sixteenth century; the motet and the Mass. Writing in up to three voices. Prerequisite: Theory 112. To receive credit, Counterpoint 102 must be completed.-3 credit hours.

**Counterpoint 102. Modal Counterpoint II.** Continuation of Counterpoint 101. Writing in four and five voices. Prerequisite: Counterpoint 101.-3 credit hours.

**Orchestration 201. Fundamentals of Orchestration I.** Instruments of the orchestra; practical scoring for individual choirs.-2 credit hours.
Orchestration 202. Fundamentals of Orchestration II. Continuation of 201. Scoring for chamber and full orchestra. Prerequisite: Orchestration 201. -2 credit hours.

History 101. Historical Survey I. A general consideration of Western civilization from antiquity to the present with special emphasis upon the development of Western musical forms and styles. -3 credit hours.

History 102. Historical Survey II. Continuation of 101. -3 credit hours.

Music Literature 101. Collegium Musicum. Discussion and internal performance of music from the beginning of the Christian era to the time of Bach. Guest artists and lectures presented. Student assignments and projects under supervision. (Meets one evening a week). -2 credit hours.

Music Literature 102. Collegium Musicum. Continuation of 101. From the pre-classic period to the present. -2 credit hours.

Music Literature 211. Piano Literature I. Analysis and performance of keyboard music from the pre-piano period to Beethoven, special attention to the piano sonata and other characteristic forms. Primarily for majors in piano composition, or history of music. -2 credit hours.

Music Literature 212. Piano Literature II. Continuation of 211. From the Romantic Period to the present. -2 credit hours.

Ensemble 111. Eastman School Chorus. A cappella literature and larger works for chorus and orchestra.


Composition 101. Fundamentals of Composition. The study of smaller forms for piano, voice, or solo instruments. -2 credit hours.

Composition 102. Fundamentals of Composition. Continuation of 101. Prerequisite: Composition 101. -2 credit hours.

Composition 221. Composition for Non-majors. Survey of musical forms. Outside written assignments in all forms. -2 credit hours.

Composition 222. Composition for Non-majors. Continuation of 221. -2 credit hours.

Conducting 211. Elective Elementary Conducting. Basic baton techniques, score-reading, transpositions, and fundamental conductorial technique as applied to orchestral, vocal and chamber music. To receive credit for Conducting 211, Conducting 212 must be completed satisfactorily. -1 credit hour.

Conducting 212. Elective Elementary Conducting. Continuation of Conducting 211. -1 credit hour.

APPLIED MUSIC

The opportunity exists for students who are not music majors to enroll in applied music at the Eastman School of Music under either of the categories listed below:

1. Credit lessons

A student who has had previous musical training may enroll in instrumental or voice lessons on a collegiate level and have the grade and credit for this work entered on his academic record. A full year's work (two semesters) must be completed successfully in order to earn the equivalent of one course credit in the College. Credit for no more than two courses may be counted towards a degree by non-music majors. Applied music taken in addition to a normal four-course program is not considered an overload, and there is no extra tuition charge.

To register:

Students previously enrolled in applied music are required to list the course by instrument and name of instructor on the Program Approval Form, e.g., Piano-Andal.

Auditions are required for students who are registering for Applied Music as an elective for the first time. Because the Eastman School of Music can accept only a limited number, preference will be given to more advanced students.

Freshmen are given the opportunity to audition during the Summer Orientation Program or during Freshman Week. A music interest card is included in the Summer Orientation mailing. Upperclassmen may obtain Applied Music request forms at the Program Advising Office, Morey Hall.

Audition appointments are made at the Music Office, Todd Union.

2. Non-credit lessons

It is possible for a limited number of students to take lessons without credit. These may be arranged independently by enrolling directly with the Preparatory Department of the Eastman School of Music. Since the cost of this type of instruction is not included in the regular college tuition, student will be billed directly by the Eastman School. College grades will not be allowed for this work under any circumstances, nor will any entry regarding this work be made on the student's permanent record.
The Naval Science curriculum is designed to satisfy U. S. Navy requirements for a male student who is seeking a commission in the U. S. Navy or U. S. Marine Corps upon graduation. Other students, designated Naval Science students, may enroll in Naval Science academic courses with the permission of the Dean of the College or the Chairman of the Department in which they are enrolled.

To obtain a commission as an officer in the U. S. Navy or U. S. Marine Corps, it is necessary that the student complete successfully the baccalaureate degree requirements and all Naval Science or Marine option requirements.

Naval Science requirements are in three categories: 1) Naval Science academic courses; 2) academic courses offered by departments other than Naval Science; and 3) Naval Science training courses.

**Naval Science Academic Course Requirements**

For academic year 1969-70 the following courses must be completed successfully:

**Class of 1973:** 105. *Principles of Naval Organization and Management*

**Class of 1972:** 106. *Naval Ships Systems*

**Class of 1971:** 221. *Navigation* and 222. *Naval Operations*

**Class of 1970:** 232. *Principles and Problems of Naval Leadership* and 233. *Naval Machinery, Nuclear Power and Ship Stability*

**Academic Course Requirements**

To be completed satisfactorily prior to being eligible for a commission:

**Class of 1973:**

*To be Completed Prior to Graduation:*

**History**—(a course providing a survey of military affairs in the United States).
Political Science—[a course dealing with formulation and implementation of United States Security Policy].

To be Completed Prior to the Senior Year:

Computer Science—[Course providing the appreciation of the powers and limits of modern computers and their applications. This requirement may be satisfied without taking a specific computer science course with approval of the chairman of the department.]

Mathematics—[Students taking courses leading to degrees in Astrophysics, Biology, Chemistry, General Science, Geographical Science, Mathematics or Physics and for students in the College of Engineering and Applied Science: Mathematics 163 and 162 are minimum requirements.] For all other students, Math. 161 and 162 are preferred, however, students may take two of the following or more advanced courses: Math. 100, Math. 150, Statistics 110.

Science—For students taking courses leading to degrees in Astrophysics, Biology, Chemistry, General Science, Geographical Science, Mathematics or Physics and for students in the College of Engineering and Applied Science the following are the minimum science requirements: Chemistry 121 and 122 or 123 and 124, or Physics 115 and 116. For all other students, the above courses are preferred, however, students may take two related laboratory science courses from offerings in the Departments of Biology, Chemistry, Geographical Sciences, and Physics and Astronomy.

Class of 1972:

Requirements same as those scheduled for class of 1973 with the exception of the History requirement which should have been satisfied by successful completion of the course NS 102, Evolution of Sea Power.

Classes of 1970 and 1971:

For regulars: satisfactory completion of two courses in mathematics and two courses in physics.

Naval Science Training Courses

Conducted during the academic year in one laboratory session weekly and in the summer during a 6-8 week training cruise.

Regular (tuition-assisted) NROTC students: three summer training cruises.

Contract (non-tuition assisted) NROTC students: one summer training cruise the last summer prior to graduation.

Two-Year Contract NROTC students: the Naval Science Institute [six week training program] during the summer preceding enrollment in the Two-Year Program and a summer cruise the summer before senior year.

All NROTC students: four semesters work in Physical Education required during their first two years and completion of Navy physical fitness and swimming requirements.

Satisfactory-Fail Option for students enrolled in any of the NROTC Programs: S-F Option may not be applied to Naval Science or Navy required academic courses.

10. Principles of Naval Organization and Management. [To develop an understanding of the structure and principles of organization and management. To examine Naval Organization and Management practices and concepts within the context of American social and industrial organization and practice. Concepts of command and control, organizations for logistics, service and support; functions and services of the Navy and Marine Corps; and shipboard organizations are included. Emphasis is placed on a conceptual analysis of management and leadership practices and techniques. No course credit.]

Omitted 1968-69

106. Naval Ships Systems. A course designed to familiarize midshipmen with the types, structure and purposes of naval ships. Ships compartmentation, compartment designations, propulsion systems, interior communications, and ship control are included. Elements of ship design to achieve safe operations, and the place of the officers in the operation of a ship. No course credit.

Omitted 1968-69

221. Navigation. Theory and techniques of the art of navigation, including dead reckoning, piloting, electronic and celestial navigation. Includes laboratory, two hours per week.

222. Naval Operations. 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. Includes laboratory, 2 hours per week.

232. Principles and Problems of Naval Leadership. [To be discontinued after Spring 1970.] Principles and problems of human relations, the principles of management, and the responsibilities of the junior officer in his role as a Division Officer. Topics include: 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. Includes laboratory, 2 hours per week.

233. Naval Machinery, Nuclear Power and Ship Stability. [To be discontinued after Spring 1970.] Basic principles relating to the transformation of energy from fuel, including nuclear fuel, to heat and power. Application of steam, internal combustion and other prime movers to propulsion and auxiliary uses in naval vessels and aircraft. Principles of ship stability and buoyancy and their application to the problems of damage control. Includes laboratory, 2 hours per week.


Omitted 1968-69

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.

Omitted 1968-69

271. Amphibious Warfare. Concept, history, development and techniques of amphibious warfare; critical analysis of selected amphibious operations.

Omitted 1968-69

272. Amphibious Planning, Naval Justice and Leadership. Planning in the amphibious operation; the administration of naval justice; and principles and techniques of leadership.

Omitted 1968-69
The Department of Philosophy offers a program leading to the B.A. degree and, at the graduate level, to the M.A. and Ph.D. degrees.

A program of concentration for the B.A. degree will normally consist of Philosophy 101 and seven courses beyond. Included in these will be Philosophy 102, 103, 104, and either 107 or 216.

The remaining courses to make up the number of ten for the concentration may be drawn from advanced courses in any other field of the humanities and social sciences and most fields of the natural sciences. (English, Foreign and Comparative Literature, History, Languages and Linguistics, Political Science, Anthropology, Economics, Biology, Physics, Psychology, and Mathematics are the fields most often chosen.)

The following courses in Philosophy may be taken to meet some of the distribution requirements in the Humanities: 103, 104, and 211. Others may be taken to fulfill the distribution requirements in the Social Sciences.

Students who wish to do advanced work in Philosophy are strongly urged to enter the Honors Program in Philosophy. In their programs, Philosophy 303 or 304 may be substituted for Philosophy 103 and Philosophy 320 for Philosophy 102, but they must take Philosophy 104. The student must also take one course in logic, either Philosophy 107 or Philosophy 215, or Philosophy 391 with research in logic. The Honors student must take at least four Honors seminars or Honors courses in Philosophy.

Qualified concentrators in Philosophy may be approved by the Department for the junior year abroad.
101. Introduction to Philosophy. Critical examination of some of the central beliefs and methods of thinking in common sense, science, and religion. Topics include: 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.

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.

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 B.C. and of their significance for the problems of today. Readings in the Pre-Socratics, Plato, Aristotle, Epicureans and Stoics.

104. History of Modern Philosophy. An introduction to modern philosophy through a study of important philosophers from the seventeenth to the end of the eighteenth century, and of their position in the cultural history of the West.

105. Introductory Logic. An introduction to symbolic logic. Definition of some semantical notions (truth, consequence, etc.) as well as of some syntactical notions (provable, derivable, etc.). Formalization of arguments. Theorems of first-order logic with and without identity.

106. Philosophy of Mind. An historical and philosophical study of some problems in the philosophy of mind; including such topics as: the nature of mental phenomena, the relation between body and mind, our knowledge of other minds, the concept of a person, and the privacy of mental states. Prerequisite: Philosophy 101 or permission of the instructor. Omitted 1968-69

204. History of Modern Philosophy II. A continuation of 104, studying the leading philosophers of Europe in the nineteenth and early twentieth centuries. Philosophy 104 is not a prerequisite to 204; but students who can take only one of the two are advised to elect 104. Omitted 1968-69

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.

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.

215. Intermediate Logic. Formal techniques of derivation in some system of higher order logic: relations, functions, equinumerosity, numbers, infinity, ancestral relations, principles of induction and recursion; selected topics. Prerequisite: Philosophy 107 or permission of the instructor.

216. Advanced Logic. Metatheory of first-order logic (Gödel's completeness theorem, Löwenheim-Skolem theorem, etc.). Further topics to be selected by the instructor. Prerequisite: Philosophy 107 or permission of instructor.

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.

237. Social and Political Philosophy. A philosophical and historical inquiry into various attempts that have been made to expound and justify the leading social and political theories. The works of philosophers such as Plato, Aristotle, Hobbes, Locke, Hume, and Marx will be examined and critically evaluated. Omitted 1968-69

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 "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. Omitted 1968-69

252. Philosophy of Science. An examination of the general characteristics of scientific formal systems, beginning with the pervasive formal systems of logic and mathematics, and including parts of specialized systems representing geometry, physics, biology, psychology, and the social sciences. Special emphasis will be placed on the role played by theoretical terms in these systems, and on the relation between more abstract and more concrete terms. Prerequisite: Philosophy 107 or permission of instructor.

258. Metaphysics. The nature of a person, the relations of mind and matter, men and machines; goal-directed behavior, voluntarism and self-originated behavior; freedom, determinism and fatalism; problems of time; the existence of God. Prerequisite: Two courses in philosophy or permission of instructor.

Mathematical Logic. (See Mathematics 220).
281. Philosophy of Law. The nature, origins, justification and interrelationships of legal systems; law and morality; natural vs. positive law; the idea of justice, and the requirements of justice and utility. Omitted 1968-69

281. The Theory of Knowledge. A study of the character of human knowledge. Main emphasis will be placed on problems such as: sense perception; truth; belief; and necessary knowledge.


291. Readings in Philosophy. The reading of philosophical literature under guidance. Planned primarily in the interest of seniors majoring in philosophy. Other students may register only with the consent of the chairman of the Department of Philosophy.

There is no prerequisite for Philosophy 303. Before taking any other Philosophy Honors seminars students should have completed Philosophy 101 or 104, except that 303 may be accepted as a prerequisite to 304.

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


306. Recent Philosophy. Studies of some of the chief philosophical movements and their leading representatives. Omitted 1968-69

310. The Structure and Scope of Knowledge. An introduction to theories of knowledge, with special emphasis upon the various views of the criteria and limits of knowledge. Omitted 1968-69

315. Language and Philosophy. A study and evaluation of the claims of contemporary linguistic philosophers that a careful analysis of language will enable us to either solve or dissolve the classical problems of philosophy. Omitted 1968-69

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.

329. Kant. Readings in the principal works of Immanuel Kant (1724-1804); with emphasis upon both the philosophical contents and Kant's position in the intellectual and cultural movements of the late eighteenth century.

330. Existential and Analytical Philosophy. Confrontation of two leading philosophical schools and attitudes, existentialism and analytical (linguistic) philosophy, through intensive study of the philosophical works of Jean-Paul Sartre and A. J. Ayer.

340. Philosophy of History. 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 inherent in varieties of historical writing. Omitted 1968-69

341. Aesthetics. 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. Omitted 1968-69

350. Concepts of Mind. Metaphysical and psychological problems of the relation of mind and consciousness to bodily conditions; foundations of psychological theory; the concept of human freedom; and philosophical disputes about immortality. The study is based on important works in philosophy and psychology from Aristotle to Gilbert Ryle. Omitted 1968-69

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. Omitted 1968-69

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 1968-69


391. Directed Research. This course is especially designed for students wishing to do Honors work in logic or some other field of philosophy in which no Honors seminar is offered. In the case of logic, a student who has not taken Philosophy 215 or 216 may be required to do the work in one of these courses as half the work, the other half consisting of some independent project. Registration only with the permission of the instructor.
Paul E. Bitgood, M.Ed. (Springfield)...Professor of Physical Education
Robert J. Dewey, M.A. (Colgate)...Professor of Physical Education and Chairman of the Department
Clarence L. Aikey, M.S. (Ithaca)...Associate Professor of Physical Education
Lyle D. Brown, M.S. (Ithaca)...Associate Professor of Physical Education
Sylvia Fabricant, M.S. (Wellesley)...Associate Professor of Physical Education and Associate Chairman of the Department
Berthaida Fairbanks, M.S. (Colorado)...Associate Professor of Physical Education
David R. Ocorr, M.A. (Columbia)...Associate Professor of Physical Education
Everett J. Phillips, M.S. (Springfield)...Associate Professor of Physical Education
Donald C. Smith, M.Ed. (Springfield)...Associate Professor of Physical Education
William L. Boomer, M.Ed. (Rochester)...Assistant Professor of Physical Education
Jessie Disston Mason, (Bouve Boston School)...Assistant Professor of Physical Education
Joanne May MacDonald, B.S. (Illinois State)...Instructor in Physical Education
Marjorie Jane Medd, B.S. (Tufts)...Instructor in Physical Education
John A. Vitone, M.A. (Western Reserve)...Instructor in Physical Education
Louis A. Alexander, A.M. (Columbia)...Professor Emeritus of Physical Education
Elmer H. Burnham, B.S.P.E. (Notre Dame)...Professor Emeritus of Physical Education
Roman L. Speegle, M.A. (Columbia)...Professor Emeritus of Physical Education
Merle Spurrier, B.A. (Ohio Wesleyan)...Professor Emeritus of Physical Education
FOR MEN:
The aim of the department is to provide physical activity and recreation for the students, to stimulate interest in their general well-being, develop skills in a variety of individual activities, 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. Each instructor takes an individual interest in counseling students.

11. **Physical Education I.** Required of all freshmen. Instruction is provided in swimming, tennis, handball, basketball, volleyball, squash, golf, wrestling, and weight training.—No credit.

13. **Physical Education II.** A continuation of Physical Education 11.—No credit.

21. **Physical Education I.** 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, volleyball, golf, wrestling and badminton.—No credit.

23. **Physical Education II.** A continuation of Physical Education 21.—No credit.

FOR WOMEN:
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.

The activities are taught for a period of eight weeks during four seasons: Fall, Winter I, Winter II, and Spring. Activities are offered from the following: American Red Cross Life Saving, archery, badminton, basketball, body conditioning, diving, fencing, field hockey, folk dance, golf, gymnastics, lacrosse, modern dance, skiing, softball, squash, swimming, tennis, trampoline, volleyball, water safety instructor’s training.

12. **Physical Education I.** Each girl is required to take a season of fundamentals of movement or fundamentals of dance. A safety proficiency swimming test is given prior to the start of the fall season. Those who do not qualify are expected to enroll in swimming. Activities for all other students are on an elective basis.—No credit.

14. **Physical Education II.** A continuation of 12.—No credit.

22. **Physical Education I.** Election from above list of activities.—No credit.

24. **Physical Education II.** A continuation of 22.—No credit.
Physics and Astronomy

W. Parker Alford, PH.D. (Princeton) ... Professor of Physics
David L. Dexter, PH.D. (Wisconsin) ... Professor of Physics
David H. Douglass, Jr., PH.D. (Massachusetts Institute of Technology) ... Professor of Physics
J. Bruce French, PH.D. (Massachusetts Institute of Technology) ... Professor of Physics
Harry W. Fullbright, PH.D. (Washington) ... Professor of Physics
Harry E. Gove, PH.D. (Massachusetts Institute of Technology), Professor of Physics and Director, Nuclear Structure Research Laboratory
Everett M. Haflern, PH.D. (Rochester) ... Professor of Physics
Edward H. Jacobsen, PH.D. (Massachusetts Institute of Technology) ... Professor of Physics
Morton E. Kaplan, PH.D. (Rochester) ... Professor of Physics and Chairman of the Department
Robert S. Knox, PH.D. (Rochester) ... Professor of Physics
Leonard Mandel, PH.D. (London) ... Professor of Physics
Robert E. Marshak, PH.D. (Cornell) ... Distinguished University Professor of Physics
Adrian C. Melissinos, PH.D. (Massachusetts Institute of Technology) ... Professor of Physics
Elliott W. Montroll, PH.D. (Pittsburgh) ... Albert Einstein Professor of Physics
Susumu Okubo, PH.D. (Rochester) ... Professor of Physics
Ronald D. Parks, PH.D. (Stanford) ... Professor of Physics and Associate Chairman of the Department
Malcolm P. Savedoff, PH.D. (Princeton) ... Professor of Astronomy
Stewart L. Sharpless, PH.D. (Chicago) ... Professor of Astronomy and Director, C. E. Kenneth Mees Observatory
Emil Wolf, PH.D. (Bristol) D.S. (Edinburgh) ... Professor of Physics
Karl H. Bennemann, PH.D. (Illinois) ... Associate Professor of Physics
Theodore Castner, PH.D. (Illinois) ... Associate Professor of Physics
J. G. M. Duthie, PH.D. (Bristol) ... Associate Professor of Physics
Carl Richard Hagen, PH.D. (Massachusetts Institute of Technology) ... Associate Professor of Physics
H. Lawrence Helfer, PH.D. (Chicago) ... Associate Professor of Astronomy
Daniel S. Koltun, PH.D. (Princeton) ... Associate Professor of Physics
Frederick Lobkowicz, PH.D. (Edg. Tech. Hochschule Zurich) ... Associate Professor of Physics
Jerome L. Rosen, PH.D. (Columbia) ... Associate Professor of Physics
Edward H. Thorndike, PH.D. (Harvard) ... Associate Professor of Physics
Leslie Allen, PH.D. (Imperial College) ... Visiting Senior Research Associate in Physics
Giordano Bisiacchi, PH.D. (Trieste) ... Visiting Senior Research Associate in Physics
Hans-Joachim Behrend, PH.D. (Hamburg) ... Visiting Senior Research Associate in Physics
Vishnu Sahai Mathur, PH.D. (Delhi) ... Senior Research Associate in Physics
Chandra Lal Mehta, PH.D. (Rochester) ... Senior Research Associate in Physics
Herch M. Nussenzveig, PH.D. (Sao Paulo) ... Senior Research Associate in Physics
Kenneth H. Purser, PH.D. (Canberra) ... Senior Research Associate in Physics and *Associate Professor of Physics
Taiji Yamanouchi, PH.D. (Rochester) ... Senior Research Associate in Physics
Robert L. Burman, PH.D. (Illinois) ... Assistant Professor of Physics
Douglas Cline, PH.D. (Manchester) . . Assistant Professor of Physics
Joseph H. Eberly, PH.D. (Stanford) . . Assistant Professor of Physics
Gerard G. Emch, PH.D. (Geneva) . . Assistant Professor of Physics
Thomas Ferbel, PH.D. (Yale) . . Assistant Professor of Physics
Bruno Gobbi, PH.D. (Swiss Federal Institute of Technology) . . Assistant Professor of Physics
Narendra Swarup Goel, PH.D. (Maryland) . . Assistant Professor of Physics
Conrad R. Sturch, PH.D. (California) . . Assistant Professor of Astronomy
Hugh Van Horn, PH.D. (Cornell) . . Assistant Professor of Astronomy
Robin Asby, PH.D. (London) . . Research Associate in Physics
Gautam Badhwar, PH.D. (Rochester) . . Research Associate in Physics
Frank A. Blood, Jr., PH.D. (Case Institute of Technology) . . Research Associate in Physics
Claude Marcel Delorme, PH.D. (Grenoble) . . Research Associate in Physics
Richard A. Elliott, PH.D. (British Columbia) . . Research Associate in Physics
Edward B. Hale, PH.D. (Purdue) . . Research Associate in Physics
John Phillip Holden, PH.D. (Wisconsin) . . Research Associate in Physics
Loke Soo Hsu, PH.D. (Rochester) . . Research Associate in Physics
Brij M. Khorana, PH.D. (Case Western Reserve) . . Research Associate in Physics
Toshitake Kohmura, PH.D. (Tokyo) . . Research Associate in Physics
Katja Lakatos, PH.D. (Cornell) . . Research Associate in Physics and *Assistant Professor of Physics
Samaresh C. Maitra, PH.D. (Maryland) . . Research Associate in Physics
R. G. J. Mills, PH.D. (Adelaide) . . Research Associate in Physics
Toru Miyakawa, PH.D. (Tokyo) . . Research Associate in Physics
Yorikyo Nagashima, PH.D. (Tokyo) . . Research Associate in Physics
Poul Olesen, PH.D. (Copenhagen) . . Research Associate in Physics
J. C. Parikh, PH.D. (Chicago) . . Research Associate in Physics
Muneer Ahmad Rashid, PH.D. (Imperial College) . . Research Associate in Physics
John J. Schwartz, PH.D. (Rochester) . . Research Associate in Physics and *Assistant Professor of Physics
Mark Howard Shapiro, PH.D. (Pennsylvania) . . Research Associate in Physics
Stephen Loeb Shapiro, PH.D. (Columbia) . . Research Associate in Physics
Paul Slattery, PH.D. (Yale) . . Research Associate in Physics
Robert L. Thews, PH.D. (Massachusetts Institute of Technology) . . Research Associate and *Assistant Professor of Physics
Alan A. Wehmann, PH.D. (Harvard) . . Research Associate in Physics
Haruo Yuta, PH.D. (Pennsylvania) . . Research Associate in Physics
Howard L. Foote, A.B. (Cornell) . . Assistant to the Chairman
Alfred L. Green, BBA (Niagara) . . Assistant to the Chairman
Sidney W. Barnes, PH.D. (Cornell) . . Professor Emeritus of Physics
Herbert R. Childs, A.B. (Rochester) . . Associate Professor Emeritus of Physics

*Part-time
The Department of Physics and Astronomy offers programs leading to the B.A., B.S., M.S. (Plan A or Plan B) and Ph.D. degrees in the fields of physics and astronomy. The following description of requirements refers particularly to the B.A. and B.S. programs in physics; the corresponding astronomy programs are described on page 130. The B.A. and B.S. degrees provide adequate preparation for most graduate schools; the B.S. program, however, provides a more intensive study of physics, while the B.A. program should be elected only by students desiring a broader academic experience.

Students are not formally accepted as physics (or astronomy) majors until their junior year. Freshman and sophomore students wishing eventually to major in physics (or astronomy) are urged to express their intent to the Department so as to be assigned a departmental adviser. Through his contact with the departmental adviser the student will be advised as to specific deficiencies he should make up, or to concentrate on some topic well suited to his aptitudes; specifically, if the prospects of his acceptance as a physics major in his junior year are weak, he will be informed in due time to seek some other major field. Clearly, however, the choice of majoring in physics (or astronomy) is the student's own responsibility contingent upon departmental approval.

The requirements for the B.S. and B.A. degree are the ones set forth by the College of Arts and Science in addition to specific departmental requirements. A synopsis of the two programs indicating how the general as well as departmental requirements may be met is given below. It will be noticed that the first two years of both programs are identical.

The introductory sequence of physics courses consists of four terms of physics: Physics 115, 116, 125 and 126, or Physics 117, 118, 127 and 128. The last four courses cover the same material as the first four, but at a deeper physical and mathematical level; students can be admitted to these courses at any term, but participation in these courses is only by departmental and instructor's approval. Similarly four terms of mathematics are required in the freshman and sophomore year and they consist of Mathematics 161, 162, 163 and 164 or Mathematics 171, 172, 173 and 174. Two additional introductory courses in the natural sciences (Group III) are required during either the freshman or sophomore year.
B.S. Program

In addition to the general and first two year requirements, the following departmental requirements must be fulfilled. In the junior year, three courses in physics must be taken (Physics 235, 237, and 238) as well as two courses in advanced mathematics. Mathematics 267 and 268 are strongly recommended, but ME 201 and 202 may be substituted, or any mathematics courses at the 200 level or higher. A laboratory course (such as EE 221 or Chemistry 251) in a related science is also required. In the senior year, three courses in physics must be taken (Physics 243, 245, and 247). In addition to the six specified physics courses in the junior and senior years, three additional physics courses must be elected from other 200-level offerings (Physics 236, 244, 246, 248, 249, 250, and 251). Students who elect neither 236 nor 246 must take Physics 249.

The program of study should be planned by the student in consultation with the departmental adviser at the end of his sophomore year and is subject to departmental approval. A synopsis of a typical B.S. program is given below.

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<th>FIRST YEAR</th>
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<tbody>
<tr>
<td>1. Physics 115 or 117</td>
<td>1. Physics 116 or 118</td>
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<tr>
<td>Physical Education</td>
<td>Physical Education (if not taken first semester)</td>
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<tr>
<th>SECOND YEAR</th>
<th>SECOND YEAR</th>
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<tbody>
<tr>
<td>1. Physics 125 or 127</td>
<td>1. Physics 126 or 128</td>
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<tr>
<td>3. Foreign Language (Group I)*</td>
<td>3. Group I</td>
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<tr>
<td>4. Group II</td>
<td>4. Group II</td>
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<tr>
<th>THIRD YEAR</th>
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<tbody>
<tr>
<td>1. Physics 235</td>
<td>1. Physics 236</td>
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<tr>
<td>4. EE 221 or Chem. 251</td>
<td>4. Elective</td>
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<td>5. Elective</td>
<td>5. Elective</td>
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<tr>
<th>FOURTH YEAR</th>
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<tr>
<td>1. Physics 243</td>
<td>1. Physics 244</td>
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<tr>
<td>2. Physics 245</td>
<td>2. Physics 250 or 251</td>
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<tr>
<td>4. Elective</td>
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<tr>
<td>5. Elective</td>
<td>5. Elective</td>
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</table>

*Most students can complete their requirements in foreign languages with one term of college work. Students who need more than one course must take the additional work in place of electives.
B.A. Program
The Department requires at least six courses in physics at the 200 level. It recommends for this minimum program Physics 235, 237, 238, 243, 245, and 247. The program must also include at least four courses beyond the introductory level in fields related to physics. The Department recommends that two of these courses be in mathematics.

FIRST YEAR
Same as B.S. Program

SECOND YEAR
Same as B.S. Program

THIRD YEAR
1. Physics 235 Theor. Phys. I A
2. Physics 237 Mod. Phys. I A
4. Elective
5. Elective

FOURTH YEAR
1. Physics 245 Theor. Phys. II A
2. Group III (Advanced)
3. Elective
4. Elective
5. Elective

1 Substitutions may be made subject to departmental approval.
2 ME201 and ME202 may be substituted or any other advanced course in Group III.
ASTROPHYSICS

The description of programs in physics on page 125 generally applies as well to the program in astrophysics. Astronomy 111 and 112 is recommended for those students without an extensive prior knowledge of elementary astronomy. Aside from the introductory four-course sequences in physics and mathematics, the B.A. program must contain at least six courses from Group III related to astrophysics and must include Astronomy 231 and 232. In both the B.A. and B.S. programs, the chosen program of Group III (science) electives must be approved by the Department Chairman or his representative as constituting a coherent degree program. Ordinarily four physics courses above the 200 level are recommended in the B.A. program and three in the B.S. program for these electives.

A synopsis of a typical program leading to the B.S. degree is given below. Students planning to pursue graduate study in astronomy should elect the B.S. program; they are encouraged to take advantage of opportunities for reading or research by taking Astronomy 293 in their senior year. In planning their programs, students should remember that proficiency in French, German, or Russian is usually required by graduate schools.

### FIRST YEAR
1. Physics 115 Physics I  
   Physics 117 Physics IA  
2. Math. 161 Analysis I  
3. Astronomy 111  
4. English Requirement  
   Physical Education

### SECOND YEAR
1. Physics 125 Physics II  
   Physics 127 Physics IIA  
2. Math. 163 Analysis III  
3. Foreign Language (Group I)  
4. Group II

### THIRD YEAR
1. Physics 235 Theor. Phys. IA  
2. Physics 237 Mod. Phys. I  
3. Math. 267  
4. Astronomy 231  
5. Elective

### FOURTH YEAR
1. Physics 247 Mod. Phys. IIA  
2. Group III**  
3. Group III**  
4. Elective  
5. Elective

1. Astronomy 111, 112 is recommended for those students without an extensive prior knowledge of astronomy. Students with a prior knowledge may substitute a Group III elective.

*Most students can complete their requirements in foreign languages with one term of college work. Students who need more than one term must take the necessary courses in place of electives.

**The chosen Group III (science) electives must be approved by the Department Chairman or his representative as constituting a coherent degree program. Ordinarily three physics courses above the 200 level are recommended.
Even though it is possible for a student to obtain advanced standing, it has been found by previous experience that all entering students should follow the introductory physics sequence beginning with Physics 115 or Physics 117 depending on his preparation and aptitude.

The Department is currently offering part-time research assistantships to a limited number of qualified undergraduates during the academic year. Full-time summer assistantships are occasionally available.

The Department also offers the two following courses intended for students not concentrating in physics: Physics 101, 102. These courses cannot be counted towards physics or astronomy concentration.

**PHYSICS**

**101. Survey of Physics I.** An introduction to the fundamental concepts of physics. Topics in the first course include Newtonian mechanics, kinetic theory of gases, and electromagnetism. Three lectures, one recitation, one lab each week.

**102. Survey of Physics II.** A continuation of Physics 101. Topics in the second course include optics, special relativity, quantum physics and nuclear physics.

**115. Physics I.** The first year of a two year sequence. An introductory course covering topics in mechanics, wave motion, kinetic theory, and thermodynamics. Mathematics 161, 162 to be taken concurrently. Three lectures, two recitations a week. Laboratory in alternate weeks.

**116. Physics II.** Continuation of Physics 115.

**117. Physics IA.** Covers the content of Physics 115 and 116 at a more intensive mathematical and physical level. Consent of the Department required. Three meetings a week. Laboratory in alternate weeks.

**118. Physics IA.** Continuation of Physics 117.

**125. Physics II.** A continuation of Physics 115 and 116 covering topics in electromagnetism, circuit theory, geometrical and wave optics, and modern physics. Mathematics 163, 164 to be taken concurrently. Satisfactory performance in Physics 115 and 116 or 117 and 118 prerequisite. Two lectures, two recitations a week. Laboratory in alternate weeks.

**126. Physics II.** Continuation of Physics 125.

**127. Physics IIIA.** Continuation of Physics 117 and 118. Covers much of the content of Physics 125 and 126 in greater breadth and depth. Formulation of Maxwell's equations and application to static electric and magnetic fields. The wave equation, plane electromagnetic waves, simple radiating systems, diffraction and interference effects. Consent of the Department required. Two lectures, one recitation per week. Laboratory alternate weeks.

**128. Physics IIIB.** Continuation of Physics 127.

**221. Introduction to Quantum Mechanics and Atomic Structure.** Includes the special theory of relativity, an introduction to quantum theory and solutions to the Schrodinger equation for simple atomic systems, quantum statistics and atomic spectroscopy. Prerequisites: Math. 164 and Physics 126. Taught by the Institute of Optics. Three lectures and one lab a week.

**222. Introduction to the Theory of the Solid State.** Includes a study of the energy band theory of solids, conduction in solids, thermionic and photoelectric emission, semiconductors, dielectrics, crystalline imperfections, mechanical properties of solids, luminescence, and photoconductivity. Prerequisite: Physics 221. Taught by the Institute of Optics. Three lectures and one three-hour lab a week.

**235. Classical Mechanics.** Covers potential theory, Lagrangian dynamics, central-force motion, coordinate transformations, and rigid-body motion. Advanced calculus prerequisite or concurrent.

**236. Advanced Classical Mechanics.** Covers the special theory of relativity, classical scattering theory, Hamiltonian dynamics, the theory of small oscillations, and the mechanics of continuous media including wave motion. Physics 235 prerequisite.

**237. Modern Physics IA.** Thermodynamics and introduction to statistical mechanics. A survey of thermodynamics, both from the classical and the statistical point of view. Covers the three laws of thermodynamics and some of their consequences, and introduces statistical mechanics. Satisfactory performance in Physics 125 and 126 or Physics 127 and 128 and Mathematics 163 and 164 prerequisite. Advanced Calculus to be taken concurrently.

**238. Modern Physics IB.** Introduction to wave mechanics. Covers the breakdown of classical theory, the quantum hypothesis of Planck and the Bohr theory of atomic phenomena. The DeBroglie hypothesis and Schrodinger's wave equation are developed and applied to atomic systems. Introductory laboratory in modern experimental methods accompanies the course. Physics 237 prerequisite. Advanced Calculus to be taken concurrently.

**243. Senior Laboratory I.** An advanced course in experimental physics, using techniques and principles of modern research. Introduces design and interpretation of measurements rather than construction of equipment. Experiments in atomic physics, nuclear physics and the solid state physics, including X-ray diffraction, nuclear resonance, beta- and gamma-spectra, nuclear reactions, electron polarization, Hall effect, superconductivity. Lectures cover topics on statistics, detector theory, electronic functional assemblies, scattering theory. Prerequisites: Physics 237 and 238. Two lectures and two laboratories each week.

**244. Senior Laboratory II.** A continuation of Physics 243. Two lectures and two laboratories each week.


247. **Quantum Mechanics.** Covers Schroedinger theory, the operator formalism, harmonic oscillator, hydrogen atom, spin and perturbation theory. Physics 235 and Advanced Calculus prerequisite.


249. **Advanced Classical Physics.** Covers special topics chosen from the content of courses 236 and 246. Required of degree candidates electing neither of those two courses. Physics 235 and 245 prerequisite.

250. **Nuclear Physics.** Covers properties of nuclei, nuclear forces, models, transitions and reactions. Physics 247 prerequisite.


253. **Theoretical Biophysics.** Covers the physical aspects of special topics in biology: molecular biology, radiation biology, individual organs, nervous systems, population and environments. Prerequisites: Physics 235, 237, 238, 245 and Advanced Calculus.

261. **Physical Optics I.** (See Optics 261).

291. **Reading or Research in Physics.** Normally open to seniors majoring in Physics.

293. **Special Topics in Physics.** Selected topics offered when justified by sufficient interest.

**ASTRONOMY**

111. **Elementary Astronomy I.** Primarily a course designed to provide a general knowledge of the universe as well as some understanding of the techniques and logical methods by which such knowledge is obtained. Three lectures, one laboratory each week.

112. **Elementary Astronomy II.** Continuation of 111.

231. **Intermediate Astronomy I.** Basic physical aspects of typically astronomical phenomena: stellar interiors, stellar atmospheres, inter-stellar medium and galactic structure, the solar system, selected topics in celestial mechanics, and vignettes of cosmological problems. Instrumentation and observational techniques used in modern astronomical research are also discussed. Prerequisites: Physics 125 and 126 or 127 and 128; Math 163, 164. Astronomy 111, 112 recommended but not required.

232. **Intermediate Astronomy II.** Continuation of 231.

291. **Reading or Research in Astronomy.** Normally open to seniors majoring in physics or astronomy.

293. **Special Topics in Astronomy.** Selected topics offered when justified by sufficient interest.
Political Science

William Theodore Bluhm, PH.D. (Chicago)...Professor of Political Science
Richard Francis Fenno, Jr., PH.D. (Harvard)...Professor of Political Science
William H. Riker, PH.D. (Harvard)...Professor of Political Science and Chairman of the Department
Arthur Goldberg, PH.D. (Yale)...Associate Professor of Political Science
S. Peter Regenstreif, PH.D. (Cornell)...Associate Professor of Political Science and of Canadian Studies
Gordon Black, A.B. (Washington)...Assistant Professor of Political Science

*Thomas Mason, PH.D. (Harvard)...Assistant Professor of Political Science
John E. Mueller, PH.D. (California, Los Angeles)...Assistant Professor of Political Science
Richard G. Niemi, PH.D. (Michigan)...Assistant Professor of Political Science
Alvin Rabushka, A.B. (Washington)...Assistant Professor of Political Science
Bo Bhurulf, PH.D. (Lund)...Postdoctoral Fellow in Political Science
Harry M. Chase, Dr.Soc.Sci. (Syracuse)...Postdoctoral Fellow in Political Science
Patricia Taylor, PH.D. (Connecticut)...Postdoctoral Fellow in Political Science
William Edwin Diez, PH.D. (Chicago)...Professor Emeritus of Political Science
Glenn Gordon Wiltsey, PH.D. (Chicago)...Professor Emeritus of Political Science

*Part-time

The Department of Political Science offers programs leading to the B.A. degree, the B.A. degree with Honors and, at the graduate level, the M.A. and Ph.D. degrees.

Political Science 101 and 102 are normally prerequisites to all other courses in Political Science; however, exceptions to this rule may be made by the instructor of each course.

A program of concentration for the B.A. degree consists of seven courses in Political Science beyond 102. Of the seven, at least one must be chosen from each of groups A, B, and C. All students (including Honors) concentrating in Political Science are required to enroll in course 210.

The remaining three courses to make up ten in the concentration may be chosen from among advanced course offerings in one of the following related fields: Anthropology, Economics, History, Mathematics, Philosophy, Psychology, and Sociology. A student interested in a related field not here listed, should consult the department adviser.

Political Science 101 and 102 are required of all students enrolling in Political Science seminars in the Honors Program unless excused by the department adviser.

Note: Undergraduate majors in political science may enroll in 400 and 500 level courses (see graduate catalogue) in political science with the permission of the instructor.


102. The American Political System. An analysis of the process of political conflict in the United States. Bargaining and coalition formation by power oriented actors are examined, and the student is introduced to a general analytical model as well as to contemporary research findings.

210. 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. It is desirable that concentrators take this course in the junior year.

Group A. International Relations and Foreign Political Systems

251. International Politics. An examination of foreign policy and world politics, especially for the period since World War II.

252. International Relations. An examination of processes, techniques, and patterns of behavior characteristic of international politics.

253. National Security Policy. An examination of the problems of war and peace in the nuclear era. Included are considerations of strategic planning, prediction, deterrence, arms control, limited war, military economics and sociology, NATO, guerrilla war, civil defense, the dispersion of nuclear weapons, and other unpleasant subjects.
254. Soviet Politics and Institutions. A survey and analysis of Soviet government, including a general discussion of Marxist-Leninist ideology. The role of the Party and its leadership, the military, the bureaucracy, etc., in institutional development. Case studies of various problems in recent Soviet domestic and foreign policy.

Omitted 1968-69

255. International Relations Theory. A survey of approaches to theory-building in international relations with some emphasis on attempts to explain war and its causes.

Omitted 1968-69

256. Problems in Comparative Politics. An examination of topics in comparative political analysis. Major emphasis will be on aspects of political affiliation, organization and participation in the major developed areas of the world.

257. Comparative Political Life. A study of the way in which indigenous values, beliefs, and attitudes affect political behavior. Material will be drawn from a variety of systems and cultures, with emphasis on the Western. Prerequisite: Consent of the instructor. Omitted 1968-69


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.

262. The Legislative Process. An analysis of decision-making in legislative bodies. Major emphasis on the American Congress, with comparative materials from state legislatures and non-American political systems.

263. The Politics of Administration. A study of the functions of bureaucracies and administrative leadership in political systems in terms of recent theories of organizations, administrative behavior, and decision-making.

264. Urban Government and Politics. An examination of the evolution of city politics in relation to social and economic change and in terms of issues of planning, urban renewal, racial conflict and transportation problems.

266. Electoral Behavior and Political Socialization. Social and psychological explanations of voting behavior and the effects of voting on political systems. Political learning at the pre-adult stage.

272. Southeast Asian Politics. A survey of contemporary political processes, political institutions, political parties, and voting. Detailed examination of one or more selected countries in the region.

273. Political Development. An analysis of the major problems involved in nation building. National integration, the growth of representative institutions, political ideologies, and bureaucratic development are among the topics considered. Material will be drawn primarily from Asian examples with consideration also given to appropriate cases from Africa and Latin America.

281. Constitutional Problems: Civil Rights. A study of judicial decision-making with emphasis on an examination of the permissible limits of governmental restraints on private rights and liberties as determined by the American judiciary.

Group C. Political Theory

285. Classics of Political Thought. Systematic political theories from Plato to Mill. An assessment of the universality of the great political theories and their relevance to the understanding of contemporary political systems. Comparisons with modern political theories.


289. Strategy in Politics. An examination of recent descriptive theories of political behavior (including theories derived from the theory of games and economic models) in order to arrive at a general theory of political strategy.

Group D. Methodology

291. Senior Reading Course in Political Science. By arrangement with the department to permit work beyond regular course offerings.

401. Scope of Political Science. A consideration of the problem of developing a discipline for political science. Special attention is given for the relation between normative and descriptive theory.

405. Design and Analysis of Survey Studies. Rationale and methods for survey studies of political behavior. Covers the planning stage, the collection and processing of data, and analysis.

412. Theories of Decision-Making. Consideration of various qualitative and quantitative theories of decision-making and of their uses in analyzing political behavior. Open to undergraduates with consent of instructor.

Omitted 1968-69

413. Theories of Organization. A consideration of theories of systems, roles, and organizations.
Honors Program in Political Science

Students who have demonstrated to the satisfaction of the Department a high level of competence may, at the middle of the junior year, elect to enter the Honors program in Political Science. A faculty member must be willing to guide the student in his Honors work during his junior and senior years. The Honors work includes:

a. Political Science 210. Students are also strongly advised to take at least one Honors seminar in Political Science.

b. Political Science 391. Senior Reading and Research for Honors, which must be taken in the senior year for eight, twelve, or sixteen hours.

c. The presentation of a paper reporting research results before members of the Department and an outside examiner.

300. The Role of War in International Politics. An examination of war as an institution and its relation to the policy-making process. Omitted 1968-69

330. Political Philosophy. An examination of selected classical political philosophies.

350. Government and Politics in Canada. An analysis of the background, institutions, and power structure of the Canadian political system. Special attention will be focused on the role of parties, their organization and the social bases of their support. Comparative aspects will be stressed with reference to British and American experience.

391. Senior Reading and Research for Honors.
Robert Ader, PH.D. (Cornell)... Professor of Psychiatry and Psychology
Bernard M. Bass, PH.D. (Ohio State)... Professor of Business Administration and Psychology; and Director, Management Research Center
Robert Merrill Boynton, PH.D. (Brown)... Professor of Psychology and Optics and Director of the Center for Visual Science
Kenneth Edwin Clark, PH.D. (Ohio State)... Dean of the College of Arts and Science and Professor of Psychology
Emory Leland Cowen, PH.D. (Syracuse)... Professor of Psychology and Psychiatry and Associate Chairman of the Department
David Elkind, PH.D. (Los Angeles)... Professor of Psychology and Psychiatry
Ralph Norman Haber, PH.D. (Stanford)... Professor of Psychology and Chairman of the Department
Karl Lowy, M.D. (Vienna)... Professor of Brain Research and Psychology
*Helen H. Newlis, PH.D. (Yale)... Professor of Psychology
Vincent Newlis, PH.D. (Yale)... Professor of Psychology
Stanley M. Sapon, PH.D. (Columbia)... Professor of Psycholinguistics and Psychology
Jerome Schwartzbaum, PH.D. (Stanford)... Professor of Psychology and Brain Research
Sidney Durwood Shirley Spragg, PH.D. (Yale)... University Dean of Graduate Studies and Professor of Psychology
Garth Thomas, PH.D. (Harvard)... Professor of Brain Research and Psychology
Forrest L. Vance, PH.D. (Minnesota)... Professor of Counseling and Psychology; Director of University Counseling and Special Services
Bernard Weiss, PH.D. (Rochester)... Professor of Radiation Biology, Brain Research, and Psychology
G. Richard Wendt, PH.D. (Columbia)... Professor of Psychology
Melvin Zax, PH.D. (Tennessee)... Professor of Psychology and Psychiatry
Alex Braiman, M.D. (New York State)... Associate Professor of Psychiatry and Psychology
Jay S. Efran, PH.D. (Ohio State)... Associate Professor of Psychology and Psychiatry
Robert H. Goldstein, PH.D. (Michigan)... Associate Professor of Psychiatry and Psychology
*Russel F. Green, PH.D. (Southern California)... Associate Professor of Psychology
Howard P. Iker, PH.D. (Rochester)... Associate Professor of Psychiatry and Psychology
James R. Ison, PH.D. (Michigan)... Associate Professor of Psychology
Victor G. Laties, PH.D. (Rochester)... Associate Professor of Radiation Biology, Pharmacology, and Psychology
Dale W. McAdam, PH.D. (Iowa)... Associate Professor of Psychology and Neurology
Arthur R. Orgel, PH.D. (Florida State)... Associate Professor of Psychiatry and Psychology
Leonard Franklin Salzman, PH.D. (Rochester)... Associate Professor of Psychiatry and Psychology
James E. Vaughan, PH.D. (Louisiana State)... Associate Professor of Business Administration and Psychology
Irving Weiner, PH.D. (Michigan)... Associate Professor of Psychiatry, Pediatrics, and Psychology
Ralph Barocas, PH.D. (Pennsylvania State)... Assistant Professor of Psychology and Psychiatry
Gerald V. Barrett, PH.D. (Western Reserve)... Assistant Professor of Business Administration and Psychology
Frank J. DaPolito, PH.D. (Indiana)... Assistant Professor of Psychology
Michael L. Davidson, PH.D. (Berkeley)... Assistant Professor of Psychology

Footnote: The principal appointment is listed first.

*Part-time
The Department of Psychology offers programs of study leading to the B.A. degree and, in graduate studies, to the Ph.D. degree.

Psychology 101 is a prerequisite to all other courses in Psychology. All students concentrating in Psychology are required to take Psychology 201 (with its prerequisite Statistics 110), and five to seven further semester courses in Psychology, at least two of which are laboratory courses in Psychology. When possible, concentrators should plan to complete Psychology 101, Statistics 110 and Psychology 201 by the end of the sophomore year. These five to seven courses are to include at least two courses from Group II and at least two courses from Group III, beyond Psychology 101. To complete the total
concentration requirement of ten courses, from two to four courses in an allied field or fields should be carefully selected. An allied field to Psychology should be chosen to permit the student to apply his knowledge gained in the study of behavior to another discipline concerned with similar problems, or where knowledge of that other discipline will be of some direct benefit to his study of Psychology. Depending on the student's interests, certain courses in Anthropology, Biology, Business Administration, Chemistry, Economics, Linguistics, Mathematics, Optics, Philosophy, Political Science, or Sociology may be approved. They should, in general, be advanced courses and selected so as to best maximize the objectives of an allied field as defined above. Faculty advisers in Psychology have a list of allied field courses that are generally acceptable. Other courses can be substituted by petition to the department, if the student has specialized interests. The selection of the allied field should be given careful thought as it is an integral part of the concentration requirement in psychology. Students planning to pursue graduate studies in Psychology should seek a broad foundation in such closely related disciplines as Biology, Chemistry, Mathematics, or Philosophy.

Concentrators in Psychology may not use any laboratory course in Psychology to satisfy the Group III laboratory science requirement of the College. Typically the department advises concentrators to take the laboratory courses in Biology although others are in principle acceptable.

A student desiring to concentrate in Psychology should apply at the Psychology Department Office, Morey 207, where he will be assigned a faculty adviser. He should consult with his adviser before developing a concentration program. Upon submitting an acceptable program a student in good academic standing who has completed successfully Psychology 101 and Statistics 110 will be admitted to a concentration in the department. Students who fail Statistics 110 or Psychology 201 are given conditional status and will be dropped from the concentration unless the course is completed satisfactorily within one semester. Normally, only courses taken in the College of Arts and Science will be accepted for credit in the concentration.

Sophomores planning to take their junior year abroad should consult with a faculty adviser in psychology to discuss their programs for both their junior and their senior years.

Whereas the lecture courses (Group A, 203-229) are designed for both psychology concentrators and those concentrating in other departments, the laboratory courses (Group B, 232-259) are designed primarily, but not exclusively, for the concentrator in psychology and other behavioral sciences. When the same area is covered both as a lecture course and a laboratory course, a student cannot receive credit for both courses. This rule presently applies to the following: Learning 203 and 253; Physiological Psychology 205 and 235; Social Psychology 220 and 250; and Personality 222 and 252. No such rule is applied to the seminar courses (Group C, 260-289).

All lecture courses (Psychology 203-229) are open to Freshmen who have completed Psychology 101 or its equivalent.

Students planning to pursue a graduate degree in Psychology should note special opportunities open especially for them. Numerous activities involving independent research are available: including an Undergraduate Research Participation Program supported by the National Science Foundation, under which six to eight awards are made for each academic year, and for each summer; on-going faculty research projects and hopefully grow into a role of junior colleague; and independent research or reading, under which a student can design and carry out a project under the supervision of a faculty member. Course credit is available for these activities if desired. Seniors who are involved in one of these activities may apply to the Department for permission to use their independent research project as evidence of distinction in psychology, and if the project is completed with sufficient merit they may be awarded their B.A. degree with distinction in psychology. Also occasionally available to students planning to go on to graduate school in psychology is an opportunity to register in graduate courses. This always requires permission of both the student's adviser and the course instructor.

1Psychology courses meeting Group I distribution requirements for the College are even-numbered; those satisfying Group III are odd-numbered.
101. Introduction to Psychology. A survey of the principles of human behavior and experience. Lectures and class discussions supplemented by demonstrations and participation in psychological research. Prerequisite to all courses in psychology.


Group A. Lecture Courses

203. Psychology of Learning. Inquiry into empirical findings and theoretical viewpoints on conditioning and learning, exemplified by research on both animal and human subjects. Related topics such as retention and transfer of training are also covered. This cannot be taken for credit if Psychology 253 is taken for credit.

205. Physiological Psychology. A basic survey course covering the major areas of physiological psychology. Prerequisite: Biology 101 or concurrent registration. This cannot be taken for credit if Psychology 235 is taken for credit.

207. Verbal Learning and Behavior. Consideration of the basic aspects of human verbal processes, including association mechanisms, serial and paired-associate learning and retention, forgetting and interference; studies of short-term memory, and acquisition of language. This course cannot be taken for credit if 237 is taken for credit.

211. Psychology of Perception. A presentation of the basic facts and theories of human perception, concentrating primarily on vision. Topics to be covered include psychophysics, form and space perception, the constancies, the effects of learning, motivation and set on perception, selective attention, and perceptual development. Assignments will be chosen from the current literature. This course cannot be taken for credit if 241 is taken for credit.

213. Psychology of Motivation. A consideration of the variables of human and animal behavior that are motivational in character. Attention will be given to empirical studies and to the theoretical models used to explain motivational principles. This cannot be taken for credit if Psychology 243 is taken for credit.

218. Psychology of Adolescence. Discussion of theory and research on adolescent behavior, personality, cognition and social adjustment. Omitted 1968-69

219. Psychology of Human Differences. An objective, and, where possible, quantitative investigation of the nature, extent, organization and causes of individual and group differences. Omitted 1968-69

220. Social Psychology. Individual behavior in relation to a variety of social environments; emphasis on such concepts as social interaction, influence, and control and on such topics as socialization of behavior systems, group processes, leadership, mass media, prejudice, and behavior in various institutional settings. This cannot be taken for credit if Psychology 250 is taken for credit.

222. Psychology of Personality. A survey of the field of personality, emphasizing modern theoretical approaches, basic methods of investigation, and current research findings. This cannot be taken for credit if Psychology 252 is taken for credit.

224. Child Psychology. Development of the child in the periods before and immediately after birth, during infancy, and adolescence. Special attention is given to the development of socialization, personality, emotion, language.

226. Psychology in Business and Industry. Applications of psychological findings and methods to problems encountered in business, industry and the professions. Topics include: Personnel selection, training and evaluation; motivation and morale; problems of supervisors 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. Cannot be taken for credit if Business 205 is taken for credit. Omitted 1968-69

228. Abnormal Psychology. Etiological factors, clinical description, and treatment of personality aberrations emphasizing the more serious forms of mental disorder. Class lectures are supplemented by demonstrations. Psychology 222 prerequisite.

Group B. Laboratory Courses

All laboratory courses require prior completion of Statistics 110 and either completion of or concurrent registration in Psychology 201.

232. The Experimental Analysis of Behavior. Basic principles of operant behavior; analysis, prediction and control of operant behavior in animals and humans; schedules of reinforcement, shaping and extinction; stimulus control and learning; verbal behavior. Laboratory work with animal and human subjects.

233. Learning with Laboratory. Topics in learning and conditioning; practice, reinforcement parameters, secondary reinforcement, discrimination learning and generalization, and the role of motivation. Laboratory work includes demonstration and analysis of basic phenomena using techniques and design principles of modern research. This cannot be taken for credit if Psychology 203 is taken for credit.

235. Physiological Psychology with Laboratory. The basic areas of physiological psychology and the basic laboratory and behavioral techniques employed in physiological research. This cannot be taken for credit if Psychology 205 is taken for credit. Prerequisite: Biology 101.

237. Verbal Processes with Laboratory. Current theory and research on verbal behavior, including acquisition, maintenance and forgetting of memory, associative processes, short-term and long-term memory mechanisms, among other topics. Laboratory demonstrations, exercises, experiments and individual research projects will be included. Not open to students who have received credit for Psychology 207.

239. Sensory Processes with Laboratory. Present concepts of how sensory systems process the energy contained in visual, auditory, and other stimuli will be considered and studied experimentally. Prerequisite: Statistics 110. Omitted 1968-69

241. Perception with Laboratory. Basic perceptual processes, including the psychophysics of sensitivity and detection, color, movement, form, shape, and depth perception, the development of perceptual abilities, and the effects of learning, motivation, and set on perceptual processes. Laboratory demonstrations and experiments.
243. Motivation with Laboratory. Material on conflict, anxiety and guilt, fantasy behavior, and unconscious processes, drawn from research using primarily humans, but also biological studies of primary and secondary drives, punishment and frustration, arousal, exploration, and stress. Laboratory experiments with both animal and human subjects. This cannot be taken for credit if Psychology 215 is taken for credit.

245. Cognition with Laboratory. A survey of theory and research concerning human intellectual functioning, including problem-solving, concept formation, word association, and creativity. Standard laboratory demonstrations and original experimentation.

247. Comparative Psychology with Laboratory. The classification of behavioral processes; the relationships between behaviors, between and within species; the identification of the origins and development of behavior; and the development of theories of behavior. Omitted 1968-69.

249. Psychological Measurements with Laboratory. A comprehensive treatment of the problems, statistical techniques, and theoretical concepts basic to psychological measurement. Laboratory work is concerned with test construction, scaling, item analysis, and determination of reliability and validity.

250. Social Psychology with Laboratory. The study of individual behavior in social contexts, with selected experiments to be conducted which illustrate research methods and techniques of social psychology in a variety of social-psychological problem areas. Cannot be taken for credit if Psychology 220 is taken for credit.

Omitted 1968-69

252. Personality with Laboratory. Emphasis on modern theoretical approaches, basic methods of investigation and current research findings with associated laboratory work and demonstrations. Cannot be taken for credit if Psychology 222 is taken for credit.

254. Developmental Psychology with Laboratory. Theory and method of developmental psychology, with special attention to the development of language, cognitive processes, perceptual abilities, social skills, and behavior, and physical and physiological growth. Laboratory will include work in an experimental classroom, observation and testing of infants and children. Cannot be taken for credit if Psychology 224 was taken for credit.

Group C. Seminar Courses

260. Seminar in Special Topics. Consideration of recent experimental and theoretical contributions in several selected areas of psychology. Students will prepare written reports for presentation and intensive discussion. Open to junior and senior psychology concentrators by permission of the instructor.

Omitted 1968-69

262. Theory and Methods in Psycholinguistics. Language behavior as viewed by theoretical linguistics, psychoacoustics, developmental, learning and experimental psychology. Admission by permission of the instructor.

263. Seminar in Learning. Consideration of major topics in learning theory and data. Of special concern will be problems of incentive and drive effects, use of pharmacological agents to study learning mechanisms, and the role of emotion in learning. Emphasis will be placed on research in the current psychological literature. Prerequisite: permission of instructor required.


267. Seminar in Verbal Behavior. Detailed consideration of selected problems in the study of verbal behavior, especially those attracting current theoretical or empirical interest in the experimental literature. Permission of instructor required.

269. Seminar in Conditioning. Examination of the original research findings in the area of conditioning, both classical and instrumental. Emphasis will be placed on the empirical bases and the theoretical implications of this research. Permission of instructor required.

271. Seminar in Perception. Perceptual systems including psychophysics of sensitivity, vision, audition, chemical senses, tactual and kinesthetic senses; emphasis on quantitative and physiological contributions to the understanding of perceptual processes. Permission of instructor required.

273. Seminar in the Psychology of Motivation. Theories of motivation, motivational antecedents, and the consequences of such antecedents on instrumental behavior, learning, and perception. Open to advanced undergraduates and to graduate students by permission of instructor.


276. Seminar in Engineering Psychology. Basic principles and research findings in the study of man-machine-task-environment relations. Discussion and student reports. Permission of the instructor required.

277. Seminar in Comparative Psychology. The concepts of the science of behavior and the application of scientific method of the study of animal conduct. Evolution of behavior and intelligence, the receptor control of activity, periodicity in behavior and higher mental processes in animals. Prerequisite: Biology 101, and permission of instructor.

278. Seminar-Practicum in Community Mental Health and Prevention of Emotional Disorders I. Consideration will be given to problems of early detection and prevention of emotional disorder, training new sources of mental health, manpower and community mental health. An effort will be made to arrange some practicum experience in these areas for all students. Permission of instructor required.

279. Seminar-Practicum in Community Mental Health and Prevention of Emotional Disorders II. A continuation of Psychology 278. Permission of instructor required.
280. Seminar in Social Psychology. Selected areas of current research in social psychology, including attitude change models and experimentation, dissonance theory, small group processes, motivational determinants of social behavior, and simulation models of group processes. Prerequisite: A previous course in Social Psychology and approval of the instructor is required.

281. Seminar in Psychological Measurement. The theoretical concepts, statistical techniques and problems basic to psychological measurement; materials on test construction, scaling, item analysis, reliability and validity. Prerequisite: Psychology 201, and permission of the instructor.

282. Seminar in Personality. Advanced study of selected topics in personality theory and research. Prerequisite: Psychology 222 or 252, and permission of the instructor.

284. Seminar in Developmental Psychology. Selected areas of current research and theory in developmental and child psychology. Special attention will be given to the work of Piaget, the recent research on cognitive processes displayed by newborn humans, and the importance of environmental variation in early life. Prerequisite: A previous course in Child or Developmental Psychology and approval of instructor.

286. Seminar on Infancy and Early Childhood. Discussion of methods and research with children during the first three years of life. Special attention will be given to perceptual, cognitive and emotional capacities of the human newborn, as well as changes over this period of life. Permission of the instructor required.

288. Seminar in Abnormal Psychology. Advanced study of the clinical descriptions and treatment of personality aberrations with special emphasis on the etiology of the more serious forms of mental disorders. Seminar discussions supplemented by student reports and by demonstrations. Permission of the instructor required.

Group D. Special Courses

Each of the following courses may be offered as a Group II or Group III course with the approval of the instructor.

289. Seminar in Current Psychological Research. A discussion of current research undertaken by members of the seminar. Frequent oral reports of their research, with opportunity for mutual criticism and suggestions. Required of all seniors working on a research project to be submitted for Distinction in Psychology, and others by permission of the Department of Psychology.

291. Reading Course in Psychology. Supervised reading on topics not covered by existing courses or on specialized topics. Permission of the instructor required.

293. Special Problems Course in Psychology. The investigation, under guidance, of a special problem in experimental psychology and the presentation of the result of the research in a paper. Permission of the instructor required.

295. Senior Thesis in Psychology. A paper based upon independent study and research, primarily for a degree with distinction. Permission of the department and instructor required.
Religious Studies

Harmon R. Holcomb, B.D. (Colgate Rochester) . . Professor of Philosophy and Director of Religious Studies.
*Vinjamuri Everett Devadutt, TH.D. (Toronto) . . Professor of Religious Studies
Grace Harris, PH.D. (Cambridge). . . Associate Professor of Religious Studies
*Richard A. Henshaw, PH.D. (Hebrew Union) . . Associate Professor of Religious Studies
*Robert Haddow Beaven, PH.D. (Chicago). . . Assistant Professor of Religious Studies
*George B. Hall, M.A. (Buffalo). . . Assistant Professor of Religious Studies
*Part-time.

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.


105. History of the Major Religions of East Asia. Taoism; Confucianism; Shinto and Buddhism in Japan. An introductory historical survey as well as a study of the basic ideas and practices of these religions. Selected source materials and secondary works.

106. History of the Major Religions of South Asia. Hinduism; Buddhism; Islam. An introductory historical survey as well as a study of the basic ideas and practices of these religions. Selected source materials and secondary works.

121. Problems in Religious Thought. An advanced course, open to any student who has completed one of the two introductory religion courses, dealing with selected subjects in the development of and in the rebellion against the Hebrew-Christian religious tradition. Among the works discussed will be those of Augustine, Aquinas, Luther, Shakespeare, Bach, Pascal, Dostoevsky, Tolstoy, Freud, and Camus. Prerequisite: Religion 101 or 103.

205. Introduction to the History of Religions. Basic orientation for the study of religious phenomena. Discussion of famous theories about religion from Plato to Mircea Eliade. Examination of what we think religion is; why we think so; and how we should go about studying it. Not open to graduate students.

300. Belief and Unbelief. An Honors seminar which will examine in some detail some issues in the thought of the Western religious tradition. The tension between belief and unbelief will be a dominant theme, and the readings will be both theological and literary. Not open to graduate students. Prerequisite: consent of instructor.

Omitted 1968-69
Sociology

Raymond Murphy, PH.D. (Northwestern)... Professor of Sociology, Chairman of the Department
Dean Harper, PH.D. (Columbia)... Associate Professor of Sociology, Assistant Professor of Psychiatry
Robert Faulkner, M.A. (UCLA)... Assistant Professor of Sociology
Walter Charles Kaufman, PH.D. (Northwestern)... Assistant Professor of Sociology
Dorothy Anderson Mariner, M.A. (Berkeley)... Assistant Professor of Sociology
Klaus Roghmann, DR. RER. POL. (Cologne)... Assistant Professor of Sociology
James Watson, M.A. (UCLA)... Assistant Professor of Sociology

The interests of sociologists range from the motivations of scientists to the organization of armies and from the leisure patterns of suburbia to the sources of industrialization. Although all of these are also in some degree the concern of other fields, they necessarily involve the ideas of social positions, social relations, and social organization—in short, the sociological perspective. In conveying this perspective the Department aims to give its students the concepts, theories, and methods with which they can learn to understand the social world for themselves. Throughout its courses the Department emphasizes the mutual influence of social theories and social facts.

The Department sees its courses in general, and its concentration in particular, as “pre-professional” only in the sense that a liberal education and a knowledge of society are parts of all pre-professional education. Those students who plan to go on to graduate work in sociology or a related field should take at least one 400-level course in junior or senior years.

For all students of the class of 1972 and later classes, Sociology 101 will be a prerequisite for all other courses. The concentration will ordinarily consist of six to eight courses in the Department; Sociology 101 will not carry credit for the concentration. The following courses are required: Sociology 200, 201, 210 or 211. A minimum of three courses distributed in at least two of the three substantive areas: Social Structure, Social Interaction, Organizations and Institutions.

Concentrators must have taken an introductory course in statistics or its equivalent no later than the first semester of the senior year; prospective concentrators who are uncertain about the statistics requirement should see the department adviser. Additional courses for the required total of ten may be taken in related fields with the approval of the departmental adviser.

101. Introduction to Sociology. Elements of social organizations; the nature of society; study of the social group and bureaucracy. Not required for other courses. Intended primarily for freshman and sophomore students.

I. SOCIOLOGICAL THEORY

202. Contemporary Sociological Theories. A rigorous examination of some contemporary theories in the sociological literature. Social interaction, small group behavior, mass phenomena, and crime and delinquency will be among the topics considered. Omitted 1968-69

II. METHODS OF RESEARCH
200. The Logic of Sociological Inquiry. The nature of sociological problems as reflected in types of units, variables, relations and research objectives. Tools of scientific procedures like the formation of concepts, hypotheses, theories, modes. Notions of implication, correlation and causality. Translation of research objective into designs, including principles of sampling.


211. Critical Analysis of Sociological Research. A detailed examination of selected research monographs, considering the development of interrelations of problem and procedure. Readings will be selected to provide a variety of substantive, methodological and technical approaches.
III. SOCIAL STRUCTURE

220. Stratification. Major theories and empirical studies of stratification in historical and contemporary settings; correlates of class structure; sources and consequences of social mobility. Admission by consent of instructor.

221. Race and Ethnic Minorities. Intergroup relations in industrial society with special attention to Negro-white relations in America.

222. Comparative Social Structure. An examination of selected topics relating to the macrosocial structure of different types of societies, Western and non-Western, industrialized and pre-industrial. Admission by consent of instructor. Omitted 1968-69

223. Urbanization. Patterns of urban and suburban growth; the spatial distribution of buildings and people; urban culture and urban blight. Omitted 1968-69

IV. SOCIAL INTERACTION

240. Society and the Individual. Social influences on the development of the individual; interaction and communication in small groups; attitude formation; role analysis. Omitted 1968-69

242. Deviant Behavior. Formal and informal social control; the development of individual and collective forms of norm violation; theories of criminality.

V. ORGANIZATIONS AND INSTITUTIONS

261. Political Sociology. The relation of social structure to political organization and participation, with special attention to the implications of empirical research on power, voting, and alienation. Omitted 1968-69

262. Industrial Sociology. Comparative historical processes of industrialization. Theories of industrial relations, business ideologies, the social organization of industry; management, white collar and blue collar worlds within the firm and implications for the stratification system of the larger society. Problem areas such as alienation, automation, trade unionism, unemployment.

263. The Sociology of Culture. The social contexts of folk, mass, and high cultures examined through a study of the social organization of the arts and crafts, the artists' roles, the audience, and typical art forms. Admission by consent of instructor.

264. Occupations and Professions. The sociology of work roles with an emphasis on types of occupations, career patterns, professionalization-deprofessionalization, and the significance of work in understanding social behavior.

265. Complex Organizations. Analysis of groups with bureaucratic structures, such as schools, hospitals, factories, and offices; the impact of the organization on the individual, functions of informal groups in organizations.

266. Medical Sociology. Social organization of the hospital; social and cultural factors in illness; recruitment and socialization of medical personnel. Omitted 1968-69

267. Community and Polity. The distribution of power, influence, and authority in urban communities; problems of conceptualization and measurement; the sources and consequences of power in a comparative perspective. Admission by consent of instructor.

268. The Sociology of Mental Health. Societal and cross-cultural definitions of mental health and mental illness. Mental illness as a form of social deviance, the process of stigmatization. The social organization of mental illness—the mental hospital, the therapeutic professions, the social world of staff and inmate. Implications of mental illness within larger social processes such as stratification, social mobility, minority group structure and culture. Admission by consent of instructor.

VI. SEMINARS, READING COURSES

291. Reading Course in Sociology. Special work individually arranged, with the consent of the department.

311. Contemporary Sociological Theories. Rigorous and systematic examination of a few contemporary theories in sociology, with topics selected from small group research, the analysis of complex organizations, the study of social structure and models of mass behavior such as voting. Some of the specific theories which have developed in the study of crime and delinquency, mental illness, industrial behavior and social mobility are examined. With consent of instructor. Omitted 1968-69
The South Asia Language and Area Center, established in 1965, seeks to encourage and facilitate the study of the languages and cultures of India, Pakistan, and Ceylon. One of eleven such enterprises in the country which are endorsed and assisted by the United States Office of Education (through provisions of the National Defense Education Act), the Center supports faculty, courses, library development, and a variety of extra-classroom activities, including musical and dance performances, films, lectures, and demonstrations.

All courses on South Asia carry full academic credit. Students wishing to plan a program of study should consult Mr. Welbon, Rush Rhees 405.

AREA

The following courses dealing wholly or in substantial part with the culture, history and institutions of South Asia are offered regularly:

Area Studies 250. South Asian Studies

   Anthropology 249; Fine Arts 103, 190, 226; Foreign and Comparative Literature—Indian 231, 232; History 186, 279, 280; Religion 104, 105, 190, 205.

LANGUAGES

Introductory through advanced instruction is available in three languages of South Asia: Hindi, Sanskrit and Pali. These language courses are offered under the auspices of the Department of Languages and Linguistics and carry both undergraduate and graduate credit.

HINDI: Spoken in North India from Rajasthan to Bihar, Hindi—in one or another of its dialects—is the native language of more than 140 million people and has been designated the official language of the Republic of India. Hindi possesses a rich literature from the medieval period. A command of Hindi will be increasingly important for all students in the humanities and social sciences who pursue Indic Studies.

101. Hindi I.
102. Hindi II.
103. Hindi Composition and Conversation I.
104. Hindi Composition and Conversation II.
105. Hindi Reading I.
Sanskrit: Classical India's principal literary and cultural medium, Sanskrit has been influential in the development of all aspects of the civilization of India. The major religious, poetic, dramatic, philosophical and scientific texts of "Hindu India" were composed in Sanskrit.

231. Sanskrit I.
232. Sanskrit II.
431. Sanskrit III.
432. Readings in Sanskrit.
433. Vedic Sanskrit.

Pali: Closely related to Sanskrit, Pali is the language in which the major texts and commentaries of Theravada Buddhism (dominant today in Ceylon, Burma, Thailand, and Cambodia) are written. Study of this literary language is essential for those wishing to specialize in Buddhist studies.

434. Pali I.
435. Pali II.
The Department of Statistics at the University of Rochester offers instruction in statistics from introductory through graduate level. A Master's degree program is now available and is intended to lead naturally into a Ph.D. program now being organized. The Department interprets the term "Statistics" in a broad sense. The courses available at the University of Rochester permit specialization in Probability Theory, Applied Probability, Mathematical Statistics, Bio-statistics, Bio-mathematics, Operations Research, Econometrics, etc. The department recognizes and emphasizes theoretical as well as applied and data-analytic aspects of statistics.


200. Theory of Probability and Applications. Random variables; binomial, Poisson, and normal distributions; mathematical expectation, law of large numbers; central limit theorem; Markov chains. Prerequisite: Math. 162.

203. Denumerable Markov Chains. Their definition and classification; properties of transient and recurrent chains; interpretation of potential theory concepts, and derivation of the classical potential principles; applications. Prerequisite: Statistics 200 and Mathematics 265.

Omitted 1968-69
207. Linear Programming and the Theory of Games. The basic properties of convex sets. The linear programming problem and its dual. Principal theorems; applications, in particular to finite games. Some infinite games. Prerequisite: Math 164.

210. Introduction to Probability and Statistics. Probability, random variables; expectation, moment generating functions; special distributions and relations between them; law of large numbers and central limit theorem; principles of estimation and testing hypotheses. Prerequisite: Mathematics 162.

211. Introduction to Statistical Inference. Principles of statistical decision theory; point and interval estimation; tests of hypotheses; multivariate normal distribution; linear hypotheses; sequential analysis and selected topics. Prerequisite: Statistics 210.


Omitted 1968-69


Omitted 1968-69


Omitted 1968-69

421. Sampling Theory. Sampling designs. Theories of inference in finite populations. Selected topics, including sampling with varying probabilities, stratified, systematic, multistage and multiphase sampling; estimation based on ratio and regression methods. Prerequisite: Statistics 211.


Omitted 1968-69

428. Analysis of Variance and Experimental Designs. Planning and analysis of experiments. Analysis of variance and covariance in systematic and random models. Block designs, factorial and fractional factorial designs. Response-surface and regression designs. Prerequisite: Statistics 211 and Mathematics 265 or equivalent.

Omitted 1968-69


Omitted 1968-69

461. Error-correcting Codes. Algebraic and information theoretic preliminaries; relation between experimental designs and error-correcting codes; necessary and sufficient conditions for the existence and efficiency of error-correcting codes; the codes due to Hamming, Chaudhuri, and others. Omit the construction; p-ary linear burst-error-correcting codes, problems involving multiple-bursts. Prerequisite: Probability and/or information theory and/or undergraduate algebra.

Omitted 1968-69
The objectives of the College of Business Administration are threefold:  
1. To improve understanding, through undergraduate and graduate study based on a broad foundation in the liberal arts and sciences, of the role of business in society, the function of the administrator in business, and the forces and relationships conditioning administrative performance; further 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.

Admission Requirements

Students are admitted to the College of Business Administration after completing the sophomore year or its equivalent in credit hours. The freshman and sophomore years are typically spent as a student in The College of Arts and Science undertaking prerequisite courses as outlined in the following schedules of distribution requirements. Assuming successful completion of the prerequisite courses, the student near the end of the sophomore year makes application for intramural transfer to the College of Business Administration.

Transfer students from other accredited institutions are also accepted by the College of Business Administration. In some cases, however, acceptance may be deferred until or conditioned upon successful completion of the indicated prerequisite courses. Due to limited housing facilities on campus, students with two or more full years of college work elsewhere are encouraged to apply as early as possible to arrange living accommodations. All applications for transfer should be directed to the Director of Admissions of the River Campus Colleges, The University of Rochester.
Distribution requirements for majors in Accounting are as follows:

I. Preprofessional Study in Business Administration
   ACC153, Principles of Accounting
   QNT205, Business Statistics

II. Minimum Study in Liberal Arts and Science
   English
   ECO101, Principles of Economics
   MATH161, Analysis I
   MATH162, Analysis II
   MATH163, Analysis III
   PHY101, 102, General Physics
   Group I Electives (Humanities)
   Group II Electives (Social Sciences)
   Laboratory Science

III. General Elective
    TOTAL

Distribution requirements for majors in Management Science:

I. Preprofessional Study in Business Administration
   ACC153, Principles of Accounting
   QNT205, Business Statistics

II. Minimum Study in Liberal Arts and Science
   English
   ECO101, Principles of Economics
   MATH100, Finite Mathematics
   MATH150, Analytic Geometry & Calculus
   MATH161, Analysis I
   Foreign Language (unless exempted)
   Laboratory Science
   Literature Electives
   Group I Electives (Humanities)
   Group II Electives (Social Sciences)
   Laboratory Science

III. General Elective
    TOTAL

Distribution requirements for majors in Business Economics:

Minimum Study in Liberal Arts and Sciences
   English
   ECO101, Principles of Economics
   MATH100, Finite Mathematics
   MATH150, Analytic Geometry & Calculus
   MATH161, Analysis I
   Foreign Language (unless exempted)
   Laboratory Science
   Literature Electives
   Group I Electives (Humanities)
   Group II Electives (Social Sciences, excepting Economics)

    TOTAL

Any English course at the 100 level except courses numbered 115-129 satisfy the English requirement in all three degree programs. Students participating in Officer Candidate programs should consult with their ROTC Unit for program planning. Naval Science or Aerospace Studies courses may be credited toward the requirements for the B.S. degree to the extent of three courses.
Deviation from this distribution of courses, particularly in evening session programs, may be permitted if a student can meet all the distribution requirements for the Bachelor of Science degree in two years or less of full-time study (or the equivalent in part-time study).

Students from the College of Arts and Science and transfer students from other institutions normally complete admission requirements in a period of two years of full-time study. A minimum cumulative grade average of 2.0 must be achieved to be considered for admission.

Satisfactory-Fail Option

Freshmen and sophomores intending to major in the College of Business Administration may elect to receive a grade of Satisfactory (S) or Fail (F) in one course per semester except in courses in business or economics. Juniors or seniors in the College of Business Administration are not eligible to take courses on a Satisfactory-Fail basis.

Students of other Colleges of the University may elect to take courses offered by the College of Business Administration on a Satisfactory-Fail basis when it is acceptable to the College in which they are registered.

Degree Programs Offered

The College administers programs of study leading to the Bachelor of Science degree, with majors in Accounting, Business Economics or Management Science. The College also offers the Master of Science with a major in Business Administration, the professional degree, Master of Business Administration, and the Doctor of Philosophy degree with a major in Business Administration.

Although the undergraduate student is not formally admitted to the College 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).

Students who wish to complete an undergraduate degree elsewhere in the University and a graduate degree in Business Administration within a five year period by combining electives and advanced business administration courses should consult the Director of the Academic Office in the College of Business Administration.

The University of Rochester is a member of the American Association of Collegiate Schools of Business. Its programs at the Master’s level have been accredited by the Association.

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 of 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.
Except in unusual cases, no student is considered for a degree with distinction without at least two years of academic work at the University of Rochester. Ordinarily nothing higher than a degree with distinction is given in such cases.

Bachelor of Science with a Major in Accounting

The degree program in Accounting is designed for students interested in careers in accounting and related areas in which a strong accounting background is appropriate. Intensive professional study combined with a core of other courses in Business Administration, builds upon a base of two or more years of study in the arts, sciences, and humanities.

Completion of this program also provides a desirable preparation for Public Accounting and meets the educational requirements for admission to the Uniform Certified Public Accounting Examination used by all states. Experience requirements vary from state to state, and interested students should write the appropriate state board for specific requirements.

The Accounting curriculum has been registered with and unconditionally approved by the Division of Professional Education, New York State Education Department. Graduates may be certified to the New York Board of Examiners as having completed the Registered Curriculum necessary for admission to the examination. Students who wish only to establish equivalency with the College’s Registered Accounting Curriculum and who have completed the basic degree in another institution should obtain counseling from the College of Business Administration at the earliest opportunity and register with the Office of Admissions as special students.

A synopsis of the general distribution requirements for the degree Bachelor of Science with a Major in Accounting follows:

1. Study in Business Administration:* 14 1/2-15 1/2 courses.
2. Study in Economics: 3-4 courses.
3. Minimum study in Liberal Arts and Science: 12 courses.
4. General Electives: 3 courses.**
5. Physical Education.

Total minimum requirement is 33 1/2 courses. Specific courses required for the degree Bachelor of Science with a Major in Accounting are listed on the typical program which follows.

*See Admission Requirements, page 147.

**Work in Aerospace Studies or Naval Science courses may be credited toward the fulfillment of the requirements of the B.S. degree to the maximum extent of three academic courses.
**TYPICAL PROGRAM.**

**B.S. in Accounting**

**FIRST YEAR**
- English
- Mathematics
- Laboratory Science
- History or Political Science Elective

**SECOND YEAR**
- ENG 102 Continental Masterpieces
- Mathematics
- Laboratory Science
- History or Political Science Elective

**THIRD YEAR**
- ENG 103 English & American Masterpieces
- ACC 153 Principles of Accounting
- General Elective
- Liberal Arts & Science Elective

**FOURTH YEAR**
- ACC 275 Income Tax Accounting I
- BSI 251 Organization, Theory & Administration
- LAW 223 Law of Sales and Negotiable Instruments (1/2 course)
- MKT 203 Marketing
- General Elective

**Bachelor of Science with a Major in Management Science**

The Management Science program meets the growing need for managers and staff with ability to use the quantitative techniques of mathematics, statistics, accounting, and operations research to identify, analyze, and solve problems in management decisions.

The curriculum for a B.S. degree with a major in Management Science is broadly based; about one-half of the required courses are in arts and sciences, including the humanities, economics, and basic mathematics. The remaining half includes quantitative techniques and behavioral science as tools, plus courses in the functional areas of marketing, accounting-finance, and production. Six electives are to be distributed in the humanities, social sciences, and natural sciences; two electives may be in either business administration or economics, and finally, there are four unrestricted electives.

A synopsis of distribution requirements for the degree Bachelor of Science with a Major in Management Science follows:

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†The two-course mathematics requirement may be satisfied by Math. 100 and 150, 100 and 161, or 161 and 162.
1. Minimum study in Business Administration: 13 1/2 courses.
2. Business or Economics Electives: 2 courses.
3. Minimum Study in Liberal Arts and Science: 13 courses.
4. General Electives: 4 courses.*
5. Physical Education.

Total minimum requirement is 32 1/2 courses. Specific courses required for the degree Bachelor of Science with a Major in Management Science are listed in the typical program which follows.

Completion of this program provides a solid background in the rapidly developing field of management science including the theory and application of conventional and quantitative methods to the solution of a wide variety of business problems. Additional specialization is available through graduate study. Most important, the inclusion of a broad spectrum of the arts and science precludes the development of narrow specialization at the undergraduate level.

TYPICAL PROGRAM

B.S. in Management Science

FIRST YEAR

English
Group II Elective
MATH 161 Analysis I
PHY 101 Survey

SECOND YEAR

Group I Elective
ECO 101 Principles of Economics
MATH 163 Analysis III
Laboratory Science

THIRD YEAR

FIN 205 Financial Management
MKT 203 Marketing
QNT 235 Computers and Numerical Analysis
QNT 241 Operations Research I

FOURTH YEAR

LAW 236 Legal Constraints on Business (1/2 course)
Business Elective**
Business Elective**
General Elective
General Elective

*Work in Aerospace Studies or Naval Science courses may be credited toward the fulfillment of the requirements of the B.S. degree to the maximum extent of three academic courses.

**Advanced courses in Marketing, Finance, Production or Accounting selected with approval of faculty advisor.
Bachelor of Science with a Major in Business Economics

This four-year program, leading to the degree Bachelor of Science with a Major in Business Economics, provides approximately three years of study in the liberal arts and sciences and one year of intensive study in business administration.

A unique feature of the program is that in his senior year the student completes the first half of the two-year graduate program leading to the degree Master of Business Administration. Thus he acquires an advantageous foundation either for immediate employment or for entering an M.B.A. program with advanced standing at the University or at most other institutions offering a broad M.B.A. program.

Formal admission to the College of Business Administration to pursue this program is granted at the end of sophomore year to assure adequate control over completion of liberal arts requirements as well as the mandatory junior year courses in economics. Transfer students may be admitted at the beginning of their senior year if their previous academic achievement is considered the equivalent, in quality and course coverage, to that of those students in the program who completed their first three years of study at the University of Rochester.

Because most, if not all, of the student's senior-year study is in first-year-graduate-level courses, admission to the program is limited to students who can be expected to complete the program with a B average or better. Upon completion of the four-year program, the student receives the B.S. degree.

Students who complete the program with at least a B average are admitted to advanced standing in the University's M.B.A. program, and ordinarily complete the M.B.A. program in one year of additional study.

The synopsis of the distribution requirements for the degree Bachelor of Science with a Major in Business Economics follows:

1. Business Administration: 5 1/2-8 1/2 courses.
2. Economics, including Business Economics: 5-8 courses.
3. Other Liberal Arts and Sciences: 19 courses.
4. Physical Education.
Total: 32 1/2 courses.

TYPICAL PROGRAM
B.S. in Business Economics

Since the program has been designed to afford the student maximum flexibility, the requirements for the first two years closely parallel those of a program leading to a Bachelor of Arts degree. (See p. 35.)

The following requirements apply for the first two years of the program:
English

Foreign Language (3 courses, unless exempted).

Eco. 101: Principles of Economics (in sophomore year)

Group I Electives: 4 courses, including at least 2 in literature

Group II Electives: 3 courses, other than economics

Group III Electives: 4 courses, including 2 laboratory science courses, Math. 100, and either Math. 150 or Math. 161

THIRD YEAR

ECO 209: National Income Analysis
ECO 211: Money, Credit & Banking
Arts & Science Elective
Arts & Science Elective

FOURTH YEAR

BEC 403: Managerial Economics
ACC 403: Management Use of Accounting Information
BSI 418: Survey of Behavioral Sciences in Management
Business or Economics Elective
LAW 236: Legal Constraints on Business (½ course)

The Business Administration Library

The Business Administration Library shares its quarters with the Education Library in the lower level of the Rush Rhees Library. It comprises a collection of reserve and reference books, current periodicals, pamphlets, research reports, business and financial services, and recent corporation annual reports. The back issues of corporation annual reports are gradually being supplemented with reports on microcards. Except for reference books, all materials are circulated. The core of the business books, approximately 30,000 volumes and back issues of periodicals, is part of the main library collection which contains over 931,000 volumes.

The University of Rochester Library is a depository for United States Government publications and New York State documents. Non-depository documents are received on microcards.

International Association of Students in Economics and Commerce
(Association Internationale des Etudiants en Sciences Economiques et Commerciales)

AIESEC is an international exchange program for juniors, seniors and graduate students who intend to pursue a career in business or economics. Participants can gain practical business experience with a firm in one of 50 foreign countries. Exchanges are usually made in the summer of the junior or senior year. Freshmen and sophomores are encouraged to participate in AIESEC's campus activities.

*Other than economics and sufficient to complete requirement of 19 courses in Arts and Sciences. Work in Aerospace Studies or Naval Science courses may be credited toward the fulfillment of the B.S. degree to the maximum extent of three academic courses.
Special Non-Credit Programs

The course listings do not include non-credit courses which are planned and conducted in cooperation with individuals, firms, trade and professional associations and governmental agencies. Attendance at these clinics, short-courses, institutes and seminars typically is sponsored by an employer concerned with keeping managers abreast of changing technological, economic, legal, social and political aspects of business. Courses may be either residential or nonresidential and organized for varying lengths of time.

Certified Public Accountant (C.P.A.): Requirements and courses in this area are listed on pages 153 and 158. To complete these courses a student need not be registered for a degree in the College. Students who wish only to establish equivalency with the College’s Registered Accounting Curriculum and who have completed their basic degree in another institution should obtain counseling from the College of Business Administration at the earliest opportunity and register with the Office of Admissions as special students. Non-degree candidates should obtain guidance either from the College or the Professional Education Division, The State Education Department (Albany, New York) prior to beginning study to qualify for admission to the Certified Public Accountant Examination.
ACCOUNTING

153. Principles of Accounting. (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.

221. Cost Accounting I. (Fall and Spring) Study of the accounting problems involved in determining, analyzing and controlling production and distribution costs, and income determination for financial statements. Budgetary control, standard costs and other topics are discussed from the viewpoint of management use in planning and control. Prerequisite: ACC153.

222. Cost Accounting II. (Spring) Special topics in cost accounting and the use of cost information for managerial decision-making. Prerequisites: ACC221, QNT205.

223. Intermediate Accounting. (Fall) An analysis of the accounting theory underlying the preparation of financial statements. Topics include: the form and content of corporate financial statements; accounting for assets, liabilities and owners' equity; problems of income determination; and analysis of financial statements and flow of funds. Prerequisite: ACC153.

236. Advanced Topics in Accounting Theory. (Spring) Research on problems in key areas of financial and managerial accounting. Topics include asset valuation and income determination, price-level adjustments and responsibility accounting. The influence of the American Institute of Certified Public Accountants, the American Accounting Association, the Securities and Exchange Commission, and others on the definition of generally accepted accounting principles is considered. Prerequisite: ACC233.

261. Auditing I. (Spring) While emphasis is placed upon the work of the professional accountant, due consideration is given to internal auditing procedures. Includes: purpose of audits, types of audits, methods of auditing procedures, the auditor's report and the legal and professional responsibilities of the auditor. Prerequisite: ACC233 or corequisite.

275. 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: ACC233 or corequisite.

276. Income Tax Accounting II. (Spring) A continuation of ACC275 with special emphasis on tax planning.

BEHAVIORAL SCIENCES IN INDUSTRY

205. Behavioral Science in Management. (Spring) Survey course of those aspects of management which involve dealing with people. Behavioral science bases of the following topics are discussed: Selection, Training, Labor Relations, Supervision, Leadership, Motivation, Morale, Attitudes, Consumer Behavior, Labor Relations, and Organization Theory.

241. 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: BS1205.

251. Organization, Theory and Administration. (Fall) An analysis based on theoretical concepts and related research of the human factors in business and industrial organizations which influence decision making. Cases and lectures focus on mechanisms used in functioning organizations to influence and develop decisions, and to insure uniformity in interpretation, consistency in application, and compatibility with organizational goals. The topics of authority, communication, and leadership are given special attention. Prerequisite BS1205.

262. Management-Union Relationships and Public Control. (Spring) 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: ECO101 and BS1205 or consent of instructor.
BUSINESS ECONOMICS

203. Managerial Economics. (Spring) Business problems are analyzed in this course in terms of economic principles and methods. The theory of demand, supply, market equilibrium, and types of competition are established. Economic reasoning is then applied to managerial decisions in the analysis and forecasting of demand, production methods and costs, price and marketing policy, and profitability measurements. Measurement and forecasting as aids to managerial decision-making under uncertainty are emphasized. Prerequisite: QNT 205.

236. Financial Institutions and Markets. (Fall) Functions and theories of money and credit, principles of commercial banking and international finance, structure and operations of the Federal Reserve system. Description and functions of other financial institutions and their role in the economy. Structure of the market for short-term and long-term funds; description of money and capital market instruments. Monetary and credit policy. Prerequisites: ACC 153 and ECO 101.

BUSINESS LAW

203. 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. -Half course.


223. 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. -Half course.

226. 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. -Half course.

236. Legal Constraints on Business. (Fall) A survey of the principles and philosophy necessary to comprehend the legal concepts constraining a business environment. Objectives are: acquiring skills to enable the businessman to foresee legal problems involved in various circumstances through a process of analytical reasoning and the ability to make, alter, and justify related conclusions; recognizing the legal consequences involved in acts relating to business ventures and the need for professional counselling in this area; reviewing the informal judicial process, e.g. negotiation and settlement, and the formal judicial procedures, e.g. commencement of suit to final judgment. -Half course.

FINANCE

205. Financial Management. (Fall and Spring) Financial policies and practices essential to business administration. Major emphasis is on corporation finance. Topics include: corporation securities, capital budgeting, long-term financing, short-term financing, administration of funds, administration of income, expansion, and reorganization. Adaptation of financial principles to specific business situations. Prerequisite: ACC 153.

246. Investment Management. (Spring) General principles of successful investment, as applied to the management of individual and institutional investors' funds. Topics include: determining investment objectives, formulating general investment policies, classifying investment media, interpreting and forecasting general market trends, analyzing leading industries, and developing criteria for the selection of individual security issues. Prerequisite: ECO 101.

GENERAL BUSINESS ADMINISTRATION

157. Fundamentals of Business Administration. (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 for illustrative purposes and to introduce the student to the methods of business problem analysis.

282. Business Policy. (Spring) Integrates the student's previous studies and further develops his ability to deal more effectively with business problems. Series of cases on policy formulation and administration, involving the functions of purchasing, production, personnel marketing, finance and accounting. These 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: FIN 205, MKT 203, PRD 208, and QNT 205.
PRODUCTION

208. Production Management. (Fall and Spring) Issues, concepts and practices encountered in effectively managing the production function. Topics include: analysis of facilities, research and product development, production planning, organizing and controlling characteristics of the manufacturing processes; control of quality, quantity and cost; and consideration of increased automation. Case analysis is emphasized, and field studies of industrial plants may be included. Prerequisite: QNT205.

220. Design of Production Facilities. (Spring) Concepts and techniques involved in the design of production systems. Topics include the translation of product or service specifications into production requirements, design of operations and processes, and location of facilities. Emphasis is placed on the use of mathematical and simulation models for the evaluation of alternative designs. Prerequisite: PRD208.

225. Production Planning and Control (Fall) Concepts and techniques of production quantity planning and control. Topics include: tactical demand forecasting, aggregate planning of employment, inventory and production levels; inventory models, scheduling and dispatching decision rules, and the design of general control systems. Prerequisite: PRD208.

QUANTITATIVE METHODS

205. Business Statistics. (Fall and Spring) Methods of collection, presentation, analysis, and interpretation of quantitative data commonly associated with business operations. Typical topics: sampling, probability, descriptive values, statistical inference, correlation and time series. Prerequisites: Two courses in college mathematics.

231. Electronic Data Processing. (Fall) General principles of computer processing and of commercial information systems. Topics include: nature and use of input, output, communications and processing equipment; principles and limited practice in programming; analysis of data processing requirements; principles of computer systems design; problem areas in the implementation and operation of computer systems, procurement of equipment, and the structure and operation of the data processing organization.

235. Computers and Numerical Analysis. (Fall and Spring) Introduction to numerical techniques used in the solution of various business problems. Typical topics include: solution of linear and nonlinear equations and systems, characteristic values of matrices, interpolation and approximation, numerical integration and differentiation, computer simulation methods. Fortran programming will be used to apply these methods. Prerequisites: Two courses in college mathematics.

241. Operations Research I. (Fall) An introduction to mathematical programming. Topics include: constrained optimization, convexity; Lagrange multipliers and duality; linear, quadratic and integer programming; rectangular games. Prerequisite: Math 163.


MARKETING

203. Marketing. (Fall and Spring) Problems involved in the movement of goods from producers to consumers and industrial users through the different channels of distribution. Analysis of the marketing functions performed by manufacturers, wholesalers, retailers, and dealers in market exchanges. Critical analysis of major marketing policies. Evaluation of such topics as pricing, branding, choice of distribution channels, selective selling, and the planning and administration of sales programs.

241. Marketing Research. (Fall) An investigation and critical examination of facts as a basis for formulating marketing policies and planning sales and promotional strategy. Topics include: scientific method and research design, basic methods of collecting data, formulating the research problem and planning the research project, application of sampling methods to marketing problems, analysis of data collected, motivation research, advertising research, product research, and sales control research. Cases are used to familiarize the student with various types of research problems which confront marketing executives. A basic course in statistical methods is recommended before enrolling in MKT241. Prerequisite: MKT203 or permission of the instructor.

243. Marketing Analysis. (Fall) The principal policy areas in marketing, including distribution, pricing, promotion and product development are studied through the use of mathematical and statistical tools. Particular emphasis is placed on the structuring of marketing decision-models. Prerequisites: MKT203, QNT242.
Faculty

Martin J. Bailey, Ph.D. (Johns Hopkins)...Professor of Business Economics
Bernard M. Bass, Ph.D. (Ohio State)...Professor of Behavioral Science and Director of the Management Research Center
John M. Brophy, Ph.D. (Cornell)...Professor of Behavioral Science
Donald F. Gordon, Ph.D. (Cornell)...Professor of Business Economics
Myron J. Gordon, Ph.D. (Harvard)...Professor of Accounting and Finance
Edwin R. Henry, Ph.D. (Ohio State)...Professor of Behavioral Science
Julian Keilson, Ph.D. (Harvard)...Professor of Mathematical Statistics and Professor of Statistics, College of Arts and Science
William H. Meckling, M.B.A. (Denver)...Professor of Business Economics
Walter Y. Oi, Ph.D. (Chicago)...Professor of Business Economics
Eric C. Vance, M.A. (Columbia)...Professor of Finance
H. Martin Weingartner, Ph.D. (Carnegie Institute of Technology)...Professor of Finance and Quantitative Methods
William C. Wichman, B.S. (Iowa State)...Professor of Business Policy
Marcus Alexis, Ph.D. (Minnesota)...Associate Professor of Marketing
Gerald V. Barrett, Ph.D. (Western Reserve)...Senior Research Associate (Associate Professor of Behavioral Science)
George J. Benston, Ph.D. (Chicago) C.P.A. North Carolina...Associate Professor of Accounting and Finance
James M. Ferguson, Ph.D. (Chicago)...Associate Professor of Business Economics
Marshall Freimer, Ph.D. (Harvard)...Associate Professor of Quantitative Methods
Joseph W. Gavett, Ph.D. (Cornell)...Associate Professor of Production
Harry J. Gilman, Ph.D. (Chicago)...Associate Professor of Economics and Statistics
Raymond Jackson, Ph.D. (Boston University)...Visiting Assistant Professor of Business Economics
Vernon G. Lippitt, Ph.D. (Harvard)...Associate Professor of Business Economics
Jack H. Matthews, D.B.A. (Indiana)...C.P.A. Kansas, New York...Associate Professor of Accounting
Philip T. Meyers, M.S. (Oklahoma State) C.P.A. Oklahoma...Associate Professor of Accounting
Patrick J. Parker, M.B.A. (Chicago)...Associate Professor of Statistics and Economics
Poduri S. Rao, Ph.D. (Harvard)...Associate Professor of Mathematical Statistics and Associate Professor of Statistics, College of Arts and Science
Leonard S. Simon, Ph.D. (Columbia)...Associate Professor of Marketing
James A. Vaughan, Ph.D. (Louisiana State)...Associate Professor of Behavioral Science and Associate Director of the Management Research Center
*Allan Wolk, LL.B. (Syracuse)...Associate Professor of Business Law and Accounting
Daniel N. Braunstein, Ph.D. (Purdue)...Assistant Professor of Behavioral Science
George H. Haines, Jr., Ph.D. (Carnegie Institute of Technology)...Assistant Professor of Marketing and Computer Science
Michael C. Jensen, Ph.D. (Chicago)...Assistant Professor of Finance and Accounting

*Part-time
Avner M. Porat, Ph.D. (Pittsburgh)... Research Associate (Assistant Professor of Behavioral Science)
Edward C. Ryterband, Ph.D. (Purdue)... Research Associate (Assistant Professor of Behavioral Science)
Charles C. Ying, Ph.D. (Harvard)... Assistant Professor of Quantitative Methods and Economics
Richard B. Coffman, M.A. (University of California, Berkeley)... Visiting Instructor of Business Economics
John A. Haas, M.B.A. (Pittsburgh)... Research Associate (Instructor in Behavioral Science)
Karumuthu M. Thiagarajan, M.B.A. (Pittsburgh)... Research Associate (Instructor in Behavioral Science)

*N. Joseph Houghton, M.B.A. (Harvard)... Senior Lecturer in Computer Science
*Leslie J. Knox, M.B.A. (Syracuse)... Senior Lecturer in Accounting
*Richard K. Schalk, B.S. (Iowa State)... Senior Lecturer in Accounting
*Charles H. Schwartz, B.A. (Niagara)... Senior Lecturer in General Business
*Laurance G. Locke, A.B. (George Washington)... Lecturer in Statistics
*Richard R. Schulz, M.B.A. (Syracuse)... Lecturer in Marketing
*Vincent H. Swoyer, Ed.D. (Harvard)... Lecturer in Computer Science
*Jerry H. Curnutt, Ph.D. (Illinois)... Associate Lecturer in Business Economics
*Thomas Sadowski, M.B.A. (Stanford)... Associate Lecturer in Marketing
*William J. Stolze, S.M. (Massachusetts Institute of Technology)... Associate Lecturer in Business Policy
*Robert M. Tyle, LL.B. (Syracuse) C.P.A. New York... Associate Lecturer in Business Law
*Nathan B. Winstanley, Ph.D. (Purdue)... Associate Lecturer in Industrial Psychology
*Michael F. Armstrong, B.S. (Rochester)... Assistant Lecturer in Computer Science

*Part-time
At no other time in the life of this nation have excellent teachers been more needed than now. Although the College of Education offers study leading to a wide range of careers in education, its undergraduate programs are aimed specifically at producing quality teachers for elementary and secondary schools.

The College of Education believes that superior teaching requires a broad background in general education. Any student who wishes to become a teacher must first complete two years of study in the College of Arts and Science. During these two years, the student should complete as many distribution requirements as possible.

Students preparing for elementary school teaching take all of their course work in the College of Education during the senior year. This professional study includes courses on the campus and direct experience with children in elementary schools. Upon the successful completion of the program, the prospective teacher receives the degree of Bachelor of Science in Education.

A student planning to teach in secondary school follows a program which provides a solid foundation in subject matter and professional courses. He enrolls in a course of study outlined by his major department in the College of Arts and Science which leads to a Bachelor of Arts degree. He begins his professional course work in the College
of Education during the junior year and completes it the fall semester of the senior year.

The College of Education also offers a Bachelor of Science in Education degree in certain subject areas. To enter this program, a student must complete the sophomore year and be admitted to the College.

To explore opportunities in education, a student should meet with the Director of Academic Advising in the College of Education as early as possible in his college career. No student may enroll in the programs of the College of Education without such a conference.

All public school teachers must meet state certification requirements, which are not identical with degree requirements at this university. The Director of Academic Advising can furnish information concerning teaching requirements in the public schools of each state. Any student expecting to teach should incorporate these certification requirements into his program early enough so that they may be completed by graduation.

The Committee on Teacher Education evaluates all applications to the undergraduate programs of the College, and subsequently notifies students of acceptance or rejection. The following steps must be followed by all students seeking admission:

1. Report to the Office of the Director of Academic Advising for an interview during the freshman or sophomore year.
2. Obtain instruction and application forms for College of Education programs from the Director of Academic Advising during the semester prior to the one in which entrance to a program of the College of Education is anticipated. Admission cannot proceed further until these forms are received by the Director’s office.
3. Meet with assigned faculty adviser for interview and preliminary program planning.
4. Enroll, at the next regular registration, in the courses outlined in conference with a faculty member of the College of Education.

Students from other institutions seeking admission with advanced standing to programs of the College of Education must first apply to the Director of Admissions of the University, who confers with the Director of Academic Advising of the College of Education to evaluate the student’s previous courses and to provide required application forms.

The College of Education accepts a limited number of well-qualified part-time students who wish to pursue a degree in Education on the condition that they complete the approved program without interruption. The Director of Academic Advising and the Committee on Teacher Education determine the conditions under which each part-time student is to be admitted.

Program in Elementary Education

After completing the first two years of college, a qualified student may follow a program of study leading to the degree of Bachelor of
Science in Education and certification in New York State for teaching the elementary school grades, Kindergarten through 6. A student who plans to concentrate in elementary education should report to the Office of the Director of Academic Advising for instructions and forms by March 1 of the sophomore year.

To meet admission requirements of the College of Education a student, by the close of his sophomore year, must complete at least 64 semester hours of selected courses and achieve a cumulative point hour average of at least 2.0.

During his junior year a student takes no courses in the College of Education. Instead he completes all liberal arts requirements, including an area of concentration. This program of academic work, however, must be approved by a College of Education adviser. Also, during the junior year, each student accepted by the College works with children in appropriate community agencies and participates in occasional activities sponsored by the College. These junior year activities are prerequisites for participation in the senior year professional program in elementary education.

Outlined below are the courses which comprise the senior year program in the College of Education and which meet the New York State certification requirements for elementary school teachers:

**Bachelor of Science in Education (Elementary)**

**GENERAL REQUIREMENTS**
1. English 111 (unless excused)
2. Foreign language (proficiency required)
3. Physical Education (four semesters, non-credit)

**DISTRIBUTION REQUIREMENTS**
1. Humanities (English, Fine Arts, Religion, etc.)
2. Social Sciences: Five courses in social sciences as listed under Group II of the distribution requirements for the College of Arts and Science. This would normally include two courses in American History and one in Sociology or Anthropology.
3. Natural Sciences: Psychology 101; two laboratory sciences; one mathematics course (Mathematics 140 recommended).

**GROUP CONCENTRATION**
Four or five courses in one group or related courses from more than one group beyond the distribution requirements, and including at least two courses at the upper division level. The group concentration must be approved by the College of Education, and must constitute a minimum of nine courses, including those that are part of the distribution requirements.

**EDUCATION REQUIREMENTS**
1. One course in social foundations
2. Two courses in educational psychology and child development
3. Three courses in curriculum and instruction
4. Student teaching (two course credits)

**ADDITIONAL ELECTIVES**
Program in Secondary Education

An undergraduate student preparing to teach an academic subject in the secondary schools, grades 7 through 12, pursues one of two degree programs. The normal preparatory course for secondary school teaching requires the completion of a B.A. program, with a departmental concentration in the College of Arts and Science, as well as the Teacher Education sequence (EdF 200, EdF 210, EdC 231, 232, 234, 235, or 236, and EdC 239) in the College of Education. Except for EdF 200 usually taken in the sophomore or junior year, the fall semester of the senior year should be reserved entirely for courses required in this sequence.

A student who completes degree requirements in the College of Arts and Science follows a program established by the department of his major subject interest. Since degree and certification requirements vary, a student often finds it necessary to take courses not required in his departmental concentration. A student should contact the Office of the Director of Academic Advising in the College of Education to be certain that his program meets the certification requirements of the State of New York or any other state in which he plans to teach.

The College of Education offers programs leading to a Bachelor of Science degree which are available to those students who have completed the sophomore year, and who, in consultation with College advisers, find it advisable to take a B.S. degree. A student interested in applying for this program must meet distribution requirements similar to those in effect for bachelor's degrees in the College of Arts and Science. Such a student plans his subject concentration with an adviser from the College of Education.

Any student enrolled in a program of preparation for secondary school teaching should apply for admission to the Teacher Education Sequence between February 1 and March 25 of his junior year. Applications and instructions may be obtained from the Director of Academic Advising.

Admission requirements to the Teacher Education Sequence are:

1. Senior standing, evidence that students will have completed certification requirements in their subject specialty and professional courses by the end of that year.

2. A cumulative point average of 2.5 or higher in the field selected for student teaching, and for students preparing in a modern foreign language, satisfactory performances on the MLA Proficiency tests.

3. A satisfactory interview with the appropriate faculty member.

4. Favorable action upon the student's application by the Committee on Teacher Education.
COURSES OF INSTRUCTION

Educational Foundations

EdF 200. Education in the American Social Order. A survey of the historical 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.

EdF 210. Educational Psychology. A general survey of concepts and data covering growth, learning, psychological measurement, personality, and problems of adjustment as they relate to the school.

EdF 211. Child Development. A study of the patterns of development of children from birth to adolescence with special emphasis on school age children. Techniques and methods of child study are reviewed.

Curriculum and Instruction

ELEMENTARY EDUCATION

EdC 220, 221. The Elementary School Curriculum I and II (three courses). Examines principles, methods and materials of teaching appropriate to the elementary school curriculum (reading and the language arts, mathematics and science, social studies, arts and crafts, music, creative dramatics, health and recreation). Planning of instructional activities, the measurement and evaluation of pupil progress, and the use of audiovisual methods and materials of instruction. Observation and participation in classroom activities of area elementary schools.

EdC 229. Student Teaching in the Elementary School (two courses). 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. Through regular seminar meetings, the students critically analyze problems, principles, and techniques of teaching with special reference to their student teaching experiences and children's behavior problems.

SECONDARY EDUCATION


EdC 231. The Teaching of English in the Secondary School. A study of recognized methods of teaching English in the secondary schools. The selection and examination of materials for the teaching of language, 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.

EdC 232. The Teaching of Social Studies in the Secondary School. The aims, present trends, 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.


EdC 235. The Teaching of Modern Foreign Languages in the Secondary School. A study of approaches to and techniques for teaching a modern foreign language. Language considered as communication skill and vehicle for cultural values. Contributions of linguistic science; organization of the curriculum, testing, use of mechanical aids.


EdC 239. Student Teaching in the Secondary School (two courses). Observation, participation and classroom teaching are done in the public high schools of Rochester and vicinity.

INTERDEPARTMENTAL COURSE

EdI 248. Programming for Automated Teaching. The development, use and analysis of sequences of items designed for automated teaching devices. All participants will receive a portion of the course material from a programmed sequence and will engage in preparing programs in an area of their own interest. In addition, methods of analyzing programmed experiences of students will be developed.
Faculty

Howard S. Bretsch, PH.D. (Syracuse) . . . Professor of Education
William A. Fullagar, Ed.D. (Columbia) . . . Professor of Education
Norman G. Gunderson, PH.D. (Cornell) . . . Professor of Education and Mathematics
Thomas J. Hill, Ed.D. (Florida) . . . Professor of Education
Frances L. Horler, PH.D. (Chicago) . . . Professor of Education
Clarence J. Karler, PH.D. (Wisconsin) . . . Professor of Education and History
Eleanore E. Larson, Ed.D. (Illinois) . . . Professor of Education
James V. Mitchell, PH.D. (Chicago) . . . Professor of Education
Harold L. Munson, Ed.D. (New York) . . . Professor of Education
Clarence M. Williams, Ed.D. (Michigan State) . . . Professor of Education
Irene J. Athey, PH.D. (California) . . . Associate Professor of Education
William H. Clark, PH.D. (Columbia) . . . Associate Professor of Education and German
Dean Corrigan, Ed.D. (Columbia) . . . Associate Professor of Education
Gerald A. Gladstein, PH.D. (Chicago) . . . Associate Professor of Education
Elizabeth Z. Howard, PH.D. (Chicago) . . . Associate Professor of Education
Glenn L. Immegart, Ph.D. (Ohio State) . . . Associate Professor of Education
Thomas R. Knapp, Ed.D. (Harvard) . . . Associate Professor of Education
William T. Lowe, D.Ed. (Illinois) . . . Associate Professor of Education
Jerome P. Lysaught, Ed.D. (Rochester) . . . Associate Professor of Education and Research Associate in Medical Education
John J. Moneta, Ph.D. (Syracuse) . . . Associate Professor of Education
Robert L. Osborn, Ed.D. (Indiana) . . . Associate Professor of Education
Milton V. Pullen, Ed.M. (Rochester) . . . Associate Professor of Education
Catherine J. Sullivan, A.M. (Columbia) . . . Associate Professor of Education
Ellsworth S. Woestehoff, Ph.D. (Minnesota) . . . Associate Professor of Education
Gerald M. Arndt, M.A. (Minnesota) . . . Assistant Professor of Education
Margaret A. Collins, Ed.M. (Rochester) . . . Assistant Professor of Education
Ajit K. Das, Ph.D. (Iowa) . . . Assistant Professor of Education
Lawrence H. Douglas, B.S. (S.U.C., Oswego) . . . Assistant Professor of Education
Lloyd A. DuVall, M.A. (Kent) . . . Assistant Professor of Education
Barry L. Kaufman, M.A. (Brooklyn) . . . Assistant Professor of Education
Margaret A. McCrory, Ed.D. (Boston) . . . Assistant Professor of Education
Richard McLaughlin, M.S. (Syracuse) . . . Assistant Professor of Education
Allan F. Muskopf, Ph.D. (Chicago) . . . Assistant Professor of Education
Donald L. Piper, M.Ed. (Illinois) . . . Assistant Professor of Education
Richard Riley, M.A. (Arizona) . . . Assistant Professor of Education
Ronald W. Sealey, M.S. (Tennessee) . . . Assistant Professor of Education
H. Jayne Vogan, M.S. (Syracuse) . . . Assistant Professor of Education
Roger M. Weir, M.S. (Penn State) . . . Assistant Professor of Education
David G. Zimpfer, Ed.D. (Buffalo) . . . Assistant Professor of Education
College of Engineering and Applied Science

Administrative Officers

Robert Gustav Loewy, PH.D. (Pennsylvania) ... Dean
Albert Gold, PH.D. (Rochester) ... Associate Dean
Carlyle Fairfax Whiting, M.S. (Rensselaer Polytechnic Inst.) ... Assistant Dean
Robert Howard Perry, PH.D. (Delaware) ... Acting Chairman of the Department of Chemical Engineering
Daniel Ward Healy, Jr., PH.D. (Harvard) ... Chairman of the Department of Electrical Engineering
Martin Lessen, S.C.D. (M.I.T.) ... Chairman of the Department of Mechanical and Aerospace Sciences
Walter Lewis Hyde, PH.D. (Harvard) ... Director of the Institute of Optics

Society is demanding more and more of its educated men and women, especially those educated in the engineering disciplines, for it is they who will compress the time scale between scientific discovery—in physics, chemistry, biology, mathematics, psychology—and the practical application of this new knowledge. As the world of the engineer becomes more stimulating and more challenging, the College is demanding more and more of its faculty and of its students. Our intent is to provide the most favorable environment in which to pursue the following objectives:

1. To prepare undergraduate students with the fundamental knowledge of engineering and the related sciences and to develop their ability to apply the principles of these sciences to ever-new situations.

2. To educate especially qualified students at the graduate level to fill the continuing need in teaching, research and advanced positions in industry. As a corollary, we plan and conduct our graduate program so as to invigorate the undergraduate engineering program.

3. To foster active research programs designed to teach graduate students the aims and methods of research, to provide a stimulating and challenging environment for all students and faculty, and to add to the store of human knowledge.

4. To be of service to its community both local and national. To meet this objective, opportunity is provided the individual for part-time
study in the College; the consulting and research resources of the
College are available to help solve special problems which are appro-
priate to these resources.

To fulfill these aims, the College is committed to a rigorous study
of the basic scientific principles of engineering backed by a solid base
of the humanities. The College accepts students only at the junior
level after a minimum of two years of a strong liberal arts education.
This philosophy of an engineering-science education built on a liberal
arts base is carried through the junior and senior years.

UNDERGRADUATE PROGRAMS
Four-Year Programs

Four-year courses of study are offered in Chemical Engineering,
Electrical Engineering, Mechanical and Aerospace Sciences, and in
Optics. These curricula, all of which lead to the Bachelor of Science
degree, provide thorough training in the basic and applied sciences
and in specialized studies in engineering and optics.

Because education for leadership in engineering calls for more than
knowledge of science and applied science, over one-fifth of the cur-
criculum time is devoted to work in the humanities, social sciences,
and free electives.

The undergraduate program is designed to provide the strongest
possible educational base upon which the engineer may build, in a
variety of ways, throughout his entire career; hence the dedication to
fundamentals. In teaching fundamentals, however, applications are
chosen which show the usefulness of these fundamentals in completely
practical modern engineering problems. Further, applications are
selected from a wide range in order to add as much breadth to the
learning experience as possible.

Laboratory work is, wherever practical, integrated with the formal
theoretical course material and frequently is not listed separately. This
is done not to lessen emphasis on laboratory work but to more clearly
demonstrate to the student the relationship between theory and practice
and, consequently, the usefulness of the theory.

Full accreditation of the programs in electrical, chemical, and me-
chanical engineering has been given by the Engineers’ Council for
Professional Development.

Enriched Five-Year Program

Normally, undergraduate programs are completed in four academic
years. A student may extend his undergraduate work over a five-year
period 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. The proposed program must meet the normal mini-
mum load requirements.

By properly choosing the electives in a five-year program the re-
quirements for both the B.S. degree in the College of Engineering
and Applied Science and a B.A. degree in a chosen field of liberal arts concentration may be completed. (See Two-College Program.)

Two-College Program

The Two-College Program or 3-2 Program offers a broad training in the humanities and social sciences combined with professional training in engineering. In this five-year program the student attends the College of Arts and Science at the University of Rochester, or a participating liberal arts college,* for three years.

After satisfactorily completing the liberal arts phase of study, he then transfers to the College of Engineering and Applied Science for his professional training. This program is especially valuable as an educational preparation for those who wish to prepare for careers which combine knowledge of the precise world of science and engineering along with the ability of understanding people, their needs and how to serve them.

Application for admission into the Two-College Program is made to the liberal arts college of the student’s choice, and is subject to the admission procedures of that institution. After three years of successful study, acceptance into the College of Engineering and Applied Science at Rochester is guaranteed upon the recommendation of the participating college. Satisfactory completion of the planned sequence of courses and the maintenance of an acceptable academic average are essential for admission to the University of Rochester.

Entrance requirements vary between the College’s four departments, but each insists that all transferring students complete the science and mathematics courses listed in the first two years of the four-year curriculum. Students then take the usual junior and senior courses with the following exceptions:

Chemical Engineering: ChE100 and ChE102 replace electives in the fall and spring of the junior year.

Electrical Engineering: EE110 is a prerequisite and must be taken at the liberal arts college or during the summer session preceding entrance. A special session EE111 replaces an elective in the humanities or social sciences during the first semester of the junior year.

Mechanical and Aerospace Sciences: Students without demonstrated competence in computer programming are required to attend the part of MAS120 dealing with that subject, although the course is not required. MAS121 replaces the second elective in the junior year.

Optics: Optics 121 and 122 are taken in place of the liberal arts elective in the junior year.

Upon completion of the program, the Bachelor of Science degree is awarded by the College of Engineering and Applied Science and the Bachelor of Arts degree by the participating college.

* A list of participating colleges may be secured by writing to the Office of the Dean, College of Engineering and Applied Science, University of Rochester.
Specialized Course Work

Flexibility is provided in each of the curricula, both four-year and five-year, so that a student may incorporate in his Bachelor's program certain specialized courses of particular interest to him. For instance, by planning his program early an engineering student may pursue a sequence of elective work in such fields as materials science, or in other selected areas in which the University has special competencies.

Graduate Programs

All of the departments in the College of Engineering and Applied Science offer programs leading to the award of Master of Science degree. The Ph.D. degree is offered in a wide variety of specializations. These graduate programs are described in the separate Bulletin of Graduate Studies.

Degree Requirements

In addition to the specific courses stipulated in the degree programs listed by each of the four departments, the student must satisfactorily complete the following requisites:

1. English: Any course at the 100 level (except 115-129).
2. Foreign Language: There is no language requirement for the undergraduate programs in the College of Engineering and Applied Science. First year foreign language courses are considered humanities.
3. Physical Education: All students are required to take physical education during each of their first four terms. Physically handicapped students may be excused or given modified programs on recommendation of the University health service.
4. Distribution Requirement: Students following the mechanical, electrical, or optics programs must complete six courses in the humanities and social sciences. At least two courses must be taken in humanities and at least two in the social sciences. Students in chemical engineering programs must complete at least five courses in the humanities and social sciences representing at least 20 hours. At least two courses must be taken in humanities and at least two in the social sciences. (Psychology 101 is accepted as a social science subject.)
5. A minimum of one year's academic course work must be completed in the College.
6. ROTC students majoring in engineering or optics must take certain Aerospace Studies or Naval Science courses in addition to the regular courses listed. A maximum of two ROTC courses (eight hours) may be used as free electives. In the electrical and mechanical engineering programs only, one ROTC course (4 hours) may be used as a social science in completing distribution requirements. Other ROTC courses must be taken as overloads.
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 in departmental major.

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 advisers not later than February 1 of the year in which they plan to graduate.

Except in unusual cases, no student is considered for a degree with distinction without at least two years of academic work at the University of Rochester. Ordinarily nothing higher than a degree with distinction is given to students taking less than four years of academic work in the University.

Preceptorials

The College frequently offers Preceptorials to freshmen in the fall semester. They are designed to introduce selected students to a particular field of engineering and are open to all qualified freshmen, including liberal arts, business administration, and education majors.

Satisfactory-Fail Option

Engineering students may elect the Satisfactory-Fail option in courses other than engineering, mathematics, physics, and chemistry.

Work-Study Program

The work-study program was established in cooperation with a wide variety of industrial and research organizations to offer a planned program of summer employment to the student.

The College cannot guarantee that all students will be placed in meaningful summer jobs, although efforts are made to aid all who are interested. The advantages of participating in the work-study program are apparent. The student who integrates three summers of significant work experience with four years of superior quality academics should have a head start toward being a truly professional engineer.

Admission Policy

Applicants may seek admission to the College of Engineering and Applied Science through intramural or extramural transfer. Students enrolled in the College of Arts and Science of the University of Roch-
ester apply for intramural transfer upon satisfactory completion of the pre-engineering work prescribed in one of the engineering departmental synopses. Students from two-year colleges or other institutions who wish to transfer to the College of Engineering and Applied Science apply to the University Admission Office (for more details see page 19). To be admitted to the College, a student must satisfy the following requirements:

1. Completion of the freshman and sophomore courses of the appropriate departmental four-year synopsis, or equivalent work acceptable to the College.

2. A cumulative grade average of at least 2.0.

3. Acceptability by the appropriate department with regard to professional promise, interest, and character.

Under certain circumstances, applicants not meeting all of the above requirements may be admitted as special or probationary students. Their status is subject to review at the end of the first semester in the College.

Common Freshman Year

Students following the Bachelor of Science programs in chemistry, physics, optics, and all branches of engineering take substantially the same courses during their freshman year, and may change among these curricula with relative ease until the end of the first year.
The major mission of the Department of Chemical Engineering is the development of competent chemical engineers, adequately prepared to contribute effectively in all phases of the profession from process industry to research. The curriculum is designed to provide a balanced experience of education and training in the humanities and social sciences, in science and mathematics, and in applied science and engineering. Chemical engineering involves at once applications of rigorous theory and methods that are largely empirical. Both require sound engineering judgment and professional standards in their successful practice, and both are dealt with in the curriculum. The Department faculty endeavors to induce in its students attitudes of scientific curiosity, engineering objectivity, and professional dedication.
**Four-Year Degree Program**

**FRESHMAN YEAR**

**First Term**
- Chem. 123 General Inorganic Chemistry
- Math. 161 Analysis I
- Phys. 115 Physics I
- English Requirement
- Ph. Ed. 11 or 12 Physical Education

**Second Term**
- Math. 162 Analysis II
- Phys. 116 Physics I
- Elective (Humanities or Social Science)
- Ph. Ed. 13 or 14 Physical Education

**SOPHOMORE YEAR**

**First Term**
- Chem. 163 Organic Chemistry II
- *Math. 163 Analysis III
- Phys. 125 Physics II
- *Chem. 100 Introduction to Chemical Engineering
- Ph. Ed. 21 or 22 Physical Education

**Second Term**
- Chem. 164 Organic Chemistry II
- *Math. 164 Analysis IV
- Phys. 126 Physics II
- *Chem. 102 Material and Energy Balances
- Elective (Humanities or Social Science)
- Ph. Ed. 23 or 24 Physical Education

**JUNIOR YEAR**

**First Term**
- Chem. 251 Physical Chemistry I
- Ch. E. 180 Eng. Materials I
- Ch. E. 243 Transport Phenomena I
- Elective

**Second Term**
- Chem. 252 Physical Chemistry II
- Ch. E. 280 Eng. Materials II
- Ch. E. 244 Transport Phenomena II
- Ch. E. 225 Chemical Engineering Thermodynamics
- Ch. E. 294 Plant Visits
- Elective
- Intersession (3 weeks)
- Ch. E. 245 Chemical Engineering Laboratory

**SENIOR YEAR**

**First Term**
- Ch. E. 231 Applied Kinetics, Reactor Design
- Ch. E. 250 Unit Operations
- Elective
- Elective

**Second Term**
- Ch. E. 273 Chemical Engineering Process Design
- Elective
- Elective
- Ch. E. 294 Plant Visits

*Students with a passing grade less than C may be required to repeat the course.

*An alternate approved sequence is Mathematics 171, 172, 173, 174 for those considered eligible by the Mathematics Department.

*An alternate approved sequence is Physics 117, 118; 127, 128 for those considered eligible by the Physics Department.

*The Chemical Engineering curriculum contains eight electives, including one in the freshman year. Of these, at least five must be selected from Humanities and Social Science courses in the College of Arts and Science, with the following stipulations and exceptions: at least two Humanities courses; at least two Social Science courses; a fifth course that must be in either Humanities or Social Science. For the purpose of electives distribution in this program, Psychology 101 may be considered a Social Science. The remaining three courses (12 credits) may be satisfied by any courses offered by the U. of R. for which the student is eligible, provided that their content is not already included in the Chemical Engineering curriculum. Students planning graduate study in Chemical Engineering or Chemistry are encouraged to include one or more years of German or Russian among their Humanities or free electives.

*Conducted during a period of 18 full working days (consecutive except for Sundays), usually during the first three weeks of June.

*This course carries a credit value of eight semester hours or two courses.
ROTC Credit

Students enrolled in Naval or Air Force ROTC programs may apply two ROTC courses (eight hours) as free electives toward a degree in the Chemical Engineering curriculum. Other ROTC courses required must be taken as an overload. Consult Faculty and Departmental Advisers for a synopsis specially applicable to ROTC students.

The student who wishes to complete both his Chemical Engineering degree and his commission in four years may find it necessary to take at least one summer session course. A more reasonable workload results if the ROTC student plans his degree-commission program for nine or 10 semesters.

*The Metallurgical and Materials Concentration* in Chemical Engineering consists of the use of the three free electives for courses in metallurgy or materials which, when properly selected, form with ChE280 a four-course composite representing a "minor" in materials engineering. Courses which may be selected as part of this option are:

- Ch.E. 283 The Structure and Properties of Solids
- Ch.E. 284 Applied Physical Metallurgy
- Ch.E. 285 Contemporary Problems in Materials Engineering
- Ch.E. 295 Metallurgical Engineering Projects
- Ch.E. 481 Corrosion
- Opt. 221 Introduction to Quantum Mechanics and Atomic Structure
- Opt. 222 Introduction to the Theory of the Solid State
- Ch.E. 263 The Chemistry of Plastic Materials
- Ch.E. 482 Colloidal and Amorphous Materials
- Ch.E. 483 Physics and Chemistry of Vitreous Materials
- Geol. 227 Intermediate Mineralogy
- Geol. 241 Introductory Petrology

Students interested in the Metallurgical and Materials Concentration should plan their sequence of courses by the beginning of their junior year. They are invited to discuss the option with their adviser or with the director of the option program.
102. Material and Energy Balances. First law of thermodynamics and the principles of equilibrium. Combined with the principle of conservation of matter, they are used to solve a variety of chemical engineering problems involving physical and chemical changes of material and accompanying heat effects.—Three lectures and one recitation or laboratory a week.

145, 146. Elements of Chemical Engineering. Analysis of chemical engineering problems and techniques for their solution. The principles of conservation, equilibrium, transport behavior, and economics applied to problems of stoichiometry, unit operations, and reactor design. Intended as an engineering supplement for chemists and a theoretical background for technicians employed in the process industries. Prerequisites: general chemistry, general physics, and calculus.—Credit—three hours each term.

160. Engineering Materials I. A review of statics followed by a study of the principles of strength of materials. The principle of application to engineering structures. Topics include: properties of materials, simple and combined stresses, theories of failure and design of engineering structures. The laboratories will be devoted to training in engineering graphics and shop practice, and will include experiments and demonstrations in testing and evaluation of material properties. Prerequisites: Math. 163 and Physics 115, 116. Three lectures and two laboratories a week.

200. Process Control and Instrumentation. Review of the principles of measurement, followed by a survey of established techniques for measuring and controlling process variables. Selection and engineering of instruments for the chemical process industries.—Credit—three hours. Two lectures and one recitation or laboratory a week.

211. Chemical Engineering Computer Calculations. An introduction to digital and analog computers with emphasis on programming techniques and their application in the solution of chemical engineering problems.—Credit—three hours. Two lectures and one recitation or laboratory a week.

212. Analysis of Chemical Engineering Data. Graphical and statistical methods of analyzing, correlating, and interpreting both laboratory and industrial data are developed. A brief study of the important economic and statistical factors underlying the optimum design of experimental programs.—Credit—three hours. Three lectures—recitations a week.

225. Chemical Engineering Thermodynamics. A study of the fundamental laws and principles of classical thermodynamics with special emphasis on their application to problems in chemistry and chemical engineering. Main topics covered are: PVT relationships for real gases and liquids; the Second Law; thermodynamic properties of fluids; production of work from heat; refrigeration; and phase and chemical equilibria. Prerequisite: ChE 102—Three lectures and one recitation or laboratory a week.

231. Applied Kinetics and Reactor Design. 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 244 prerequisite. Illustration of principles in the laboratory by means of an analog computer.—Three lectures and one or two laboratories a week.

243. Transport Phenomena I. Rigorous treatment of the theory of fluid flow; application of the theory to problems of laminar and turbulent flow through pipes, flow through particulate beds, and mixing processes. Theory and application of heat transfer.—Three lectures and one recitation or laboratory a week.

244. Transport Phenomena II. A continuation of ChE 243. Formulation of the theory of mass transfer with reference to diffusive and convective transport of material in static and flowing systems.—Three lectures and one recitation or laboratory a week.

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. Experience in writing effective technical reports is an important part of the course. CHM 124 and ChE 244 are prerequisite.—Credit—three to four hours. Equivalent of nine to twelve hours a week.

250. Unit Operations. Selected problems for such basic unit operations as distillation, absorption, extraction, drying, humidification, filtration, sedimentation and evaporation.—Three lectures and one laboratory a week.

261. Introduction to Nuclear Engineering. An introductory course dealing briefly with a number of problems in the nuclear field. Draws extensively on the engineering student's earlier educational background. Topics studied: introduction to nuclear physics; reactor components and analysis; materials of construction; power systems and controls; waste disposal and safety.—Three lectures and one laboratory a week.
263. **The Chemistry of Plastic Materials.** Discussion of sources of chemical raw materials and conversion of these materials to resins. General principles of polymer formation. Description of each important class of plastic materials, 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.

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 multivariable experiment is demonstrated.—Credit—one or two hours. One or two three-hour laboratories a week.

266. **Analysis of Industrial Chemical Processes.** Critical examination of selected industrial chemical processes that illustrate the successful applications of mass and energy balances, thermodynamics, reaction kinetics, and engineering economics.—Credit—two hours. Two lectures a week.

273. **Chemical Engineering Process Design.** An intensive course for seniors. Fundamental material in transport phenomena, thermodynamics, reaction kinetics, unit operations, and materials science, inter-related and applied to the design of complete chemical plants. Advanced optimization techniques, process control theory, and manufacturing and capital cost estimation applied to design. Emphasis on fundamental and advanced techniques with decision among process alternatives based on economic considerations. The entire staff cooperates in the teaching of the course so as to offer the student the most recent knowledge in a number of specialties. ChE 231 and 250 are prerequisites.

278. **The Chemical Industry and Its Operation.** Review of the history of chemical technology and the emergence of the modern chemical industry. Study of the organization, financing and economic profile of the process industries. Interplay between technical and economic factors. 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.—Credit—two hours. Two lectures a week.

280. **Engineering Materials II.** Structure and properties of materials including metals, glass, and polymers. Major emphasis is on metal systems involving solidification, alloying, equilibrium phase diagrams, non-equilibrium phase transformation, corrosion, and high temperature behavior. Prerequisites: Chem 251, ChE 180, Phys. 125, 126.—Three lectures and one laboratory a week.

283. **The Structure and Properties of Solids.** A treatment of the principles underlying the behavior and use of engineering materials. Topics covered: structure of matter, X-ray diffraction, phase diagrams, rate processes, mechanical and other physical properties of solids. Prerequisites: ChE 280, sophomore physics and math.—Three lectures and one three-hour laboratory a week.

284. **Applied Physical Metallurgy.** A study of alloy systems, relating phase diagrams, heat treatments, and microstructure to mechanical and other physical properties.—Three lectures and one three-hour laboratory a week.

285. **Contemporary Problems in Materials Engineering.** A study of current literature relating to materials research and development. Class periods will be devoted to discussion and critiques of the assigned reading. Prerequisites: ChE 283 or Optics 222.—Three lectures a week.

290. **Special Topics.** A senior seminar course. Current practices and current research developments in chemical engineering. Students of particular technical aptitude concentrate on advanced topics of theoretical character; others concentrate on design practice, engineering economics and cost considerations, and plant practice. ChE 244 prerequisite.—Credit—three hours. Two 75-minute meetings a week.

292. **Chemical Engineering Projects.** The student is placed on his own initiative in the pursuit of an original problem related to chemical engineering. The work may be experimental, theoretical, or computational. Only highly qualified students may enroll. ChE 244 is prerequisite and consent of the Department is required.—Credit—one to four hours.

294. **Plant Visits.** Appropriate industrial plants that illustrate chemical engineering in practice are visited. The visits are preceded by explanation and followed by discussion.—No credit.

295. **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 or laboratory work. A complete engineering report is required. Permission of instructor and the department required. Credit—two to four hours.

401. **Dynamics and Control of Chemical Processes.** Credit—three hours.

411, 412. **Analysis of Chemical Engineering Problems.** Credit—three hours each term.

421. **Advanced Chemical Engineering Thermodynamics.** Credit—three hours.

431. **Chemical Engineering Kinetics and Catalysis.** Credit—three hours.

441. **Advanced Transport Phenomena.** Credit—three hours.

450. **Advanced Unit Operations.** Credit—three hours.

451. **Filtration.** Credit—three hours.

452. **Agitation.** Credit—three hours.

481. **Corrosion.** Credit—three hours.

482. **Amorphous and Colloidal Materials.** Credit—three hours.

483. **Vitreous Materials.** Credit—three hours.
The Department of Electrical Engineering seeks to give students the background for entrance into the profession of engineering directly from the completion of the baccalaureate degree as well as to prepare students for further study at the graduate level. The curriculum is therefore based on a firm foundation of fundamental sciences, particularly physics and mathematics. Students study these subjects during the first three years of their program at Rochester.

Courses in electrical engineering, which are given from the sophomore year on, are selected from a large number of possible alternatives on the basis of their potential for broad application to electrical engineering. The normal academic load of four courses per term reduces the time spent in formal instruction compared to many engineering curricula. This reduction in class time permits a greater amount of time to be spent on individual assignments and projects, and stresses the responsibility of the student to learn on his own.
Four-Year Degree Program

FRESHMAN YEAR
First Term
Math. 161 Analysis I
Phys. 115 Physics I
Chem. 121 General Chemistry I
English Requirement
Phys. Ed. 11 or 12 Physical Education I

Second Term
Math. 162 Analysis II
Phys. 116 Physics I
Chem. 122 General Chemistry II
Elective (Humanities or Social Science)
Ph. Ed. 13 or 14 Physical Education II

SOPHOMORE YEAR
First Term
Math. 163 Analysis III
Phys. 125 Physics II
E.E. 110 Network Analysis I
Elective (Humanities or Social Science)
Ph. Ed. 21 or 22 Physical Education I

Second Term
Math. 164 Analysis IV
Phys. 126 Physics II
E.E. 111 Network Analysis II
Elective (Humanities or Social Science)
Ph. Ed. 23 or 24 Physical Education II

JUNIOR YEAR
First Term
E.E. 202 Engineering Analysis II
E.E. 221 Electronics
Opt. 221 Introduction to Quantum Mechanics and Atomic Structure
Elective (Humanities or Social Science)

Second Term
E.E. 201 Engineering Analysis I
E.E. 222 Systems Analysis
Opt. 222 Introduction to the Theory of the Solid State
Elective (Humanities or Social Science)

SENIOR YEAR
First Term
E.E. 231 Electricity and Magnetism
E.E. 241 Communications Systems I
Elective (Technical)
Elective (Humanities or Social Science)

Second Term
E.E. 232 Wave Motion
Elective (Technical)
Elective (Technical)
Elective (Open)

An alternate approved sequence is Mathematics 171, 172, 173, 174 for those considered eligible by the Mathematics Department.

An alternate approved sequence is Physics 117, 118; 127, 128 for those considered eligible by the Physics Department.

An alternate course is Chemistry 123, 124 for students considered eligible by the Chemistry Department.

To satisfy the distribution requirements, a student must elect three Humanities courses and three Social Science courses.

Especially selected students may be permitted to carry one additional elective during each term for a maximum of 36 courses total.

Technical Electives available to Electrical Engineering students include:

EE243 Communication Systems II
EE206 Transistor Characteristics and Circuits
EE264 Electronic Circuit Analysis II

and, upon the approval of the department, courses selected from the 400-numbered series. In addition, students are invited to consider, with the guidance of their adviser, suitable courses in Mathematics, Physics, and the other Engineering Sciences. Students interested in the Biomedical Engineering field are urged to choose as electives courses in Biology, as well as Organic Chemistry.
110, 111. Network Analysis I, II. An introductory course in circuit analysis considering both passive LRC elements and active elements as defined by their terminal characteristics. Topics include steady-state and transient analyses, equivalence theorems, harmonic waveform analysis, and problem solutions using the Laplace transform. A laboratory introduces instruments and techniques of electrical measurements, methods for solving network problems on a digital computer, Fortran programming language and basic operative skills for an IBM 1620 computer.

201. Engineering Analysis I. A course divided between topics in theory of probability and statistics and the theory and application of vectors and tensors.

202. Engineering Analysis II. An introduction to the theory of functions of a complex variable with emphasis on the background leading to an understanding of Fourier analysis and Laplace Transform Theory.

206. Transistor Characteristics and Circuits. A study of the physical characteristics of semiconductor devices, particularly at junction transistors, and the analysis and design of transistor circuits emphasizing the unique properties of the transistor. EE221 prerequisite.

207. Solid State Electronics Laboratory. A laboratory providing training in certain techniques of solid state electronics component fabrication. These involve semiconductor crystals and junctions, magnetic cores and thin films, superconducting films, and passive element films and structures. Two project-type experiments will be required per semester. This course may be taken for credit more than once. Admission by permission of the instructor. Credit—three hours.

221. Electronics. An analysis of the basic active devices and circuits which are the building blocks of electronic systems, i.e., rectifiers, amplifiers, oscillators, and trigger or pulse circuits—Laboratory.

222. Systems Analysis. Theory of lumped parameter system analysis. Topics include parameter and energy definitions, system equations, analogs, graphs, matrix characterization, Lagrangian formulation, electro-mechanical devices, state concepts and feedback control. Use is made of the theory of functions of a complex variable developed in EE202, and matrix and vector techniques developed in a companion course, EE201. EE111 is also prerequisite—Laboratory.


232. Wave Motion. A general treatment of wave phenomena. Topics studied include characteristics of partial differential equations: fundamental solutions of the one-dimensional wave equation, transient and steady-state behavior of physical systems that may be represented as transmission lines, and boundary-value problems for rectangular, spherical, and cylindrical geometries. Examples are drawn from a variety of fields, such as electromagnetic theory, mechanics, acoustics, hydrodynamics, elasticity, and so on. Laboratory instruction is included.

241. Principles of Communication I. An introduction to theoretical and practical communication engineering, including studies of: signal analysis and linear filtering; sampling theory; amplitude, frequency, and pulse modulation; simple noise phenomena; comparative system analysis; elements of information theory—Laboratory.

243. Principles of Communication II. A continuation of EE241 offered as a senior elective or preparatory course for new graduate students. After a review of elementary probability and statistics, topics such as stochastic processes and physical origins of noise will be discussed as the background and interests of the class warrant.

263. Electronic Circuit Analysis I. A study of electronic circuits, including power supplies, ac amplifiers, dc amplifiers, sinusoidal wave form generators, modulators and de-modulators. A course primarily offered for other than electrical engineers and not normally acceptable for credit in Electrical Engineering—Laboratory.

264. Electronic Circuit Analysis II. A continuation of EE263. Pulse circuitry and transient analysis are emphasized. This course may, with permission, be taken for credit in Electrical Engineering.

290. Special Problems in Electrical Engineering. A reading or research course open to electrical engineering seniors by special permission.

401. Computer Electronics.

405. Electronic Physics.

409. Acoustics of Liquids and Solids I.

451. Linear Systems.

452. Advanced Network Analysis.
A Bachelor of Science Degree in Mechanical Engineering has been offered for more than fifty years at the University of Rochester. In accordance with recently re-oriented and broadened objectives of both the undergraduate and graduate programs, the department name was recently changed to the Department of Mechanical and Aerospace Sciences. The change also reflects the desire of the University to participate more effectively in meeting the nation's growing need for well-prepared, creative engineers capable of assuming leadership roles in their profession. It is to be noted, however, that the undergraduate program continues to be a program in Mechanical Engineering, stressing the more basic aspects of the field.

The program of the Department of Mechanical and Aerospace Sciences might best be described as a program in the applied sciences with emphasis in the direction of energetics, material science, and solid and fluid mechanics. It is felt that one of the principal interests of mechanical engineering remains in the broad field of energy conversion. Recent developments have indicated possibilities of converting energy in new and exotic ways such as magnetohydrodynamic energy conversion, thermionic and thermoelectric direct energy conversion, fuel cell energy conversion, and fusion and fission nuclear energy conversion. Since progress in energy conversion methods depends heavily on advances in other areas, great emphasis in the mechanical engineering program is laid upon the mechanics and physics of plasmas, fluids and solids, particularly as they relate to the field of energetics. Related fields making use of advances in energetics, such as vehicle technology and transportation, are also concerns of the mechanical engineer.

Although the mechanical and aerospace sciences program provides a particularly good foundation for moving into graduate work, it is at the same time equally effective as a basic preparation for the graduate who plans to enter industry immediately upon graduation. It is essential for him to have the type of education which will allow him to keep up with the rapid advances in science and technology.
Four-Year Degree Program

FRESHMAN YEAR
First Term
Math. 161 Analysis I
Phys. 115 Physics I
Chem. 121 General Chemistry I
English Requirement
Ph. Ed. 11 or 12 Physical Education I

SOPHOMORE YEAR*
First Term
Math. 163 Analysis III
Phys. 125 Physics II
M.A.S. 120 Introduction to Mechanical Engineering
Elective* (Humanities or Social Science)
Ph. Ed. 21 or 22 Physical Education I

JUNIOR YEAR*
First Term
M.A.S. 201 Engineering Analysis I
M.A.S. 221 Analytical Mechanics
M.A.S. 223 Thermodynamics
Elective* (Humanities or Social Science)

SENIOR YEAR*
First Term
Opt. 221 Introduction to Quantum Mechanics and Atomic Structure
M.A.S. 203 Mechanical Engineering Systems Design I
Elective (Technical)
Elective* (Humanities or Social Science)

Second Term
Math. 162 Analysis II
Phys. 116 Physics I
Chem. 122 General Chemistry II
Elective* (Humanities or Social Science)
Ph. Ed. 13 or 14 Physical Education II

Second Term
Math. 164 Analysis IV
Phys. 126 Physics II
M.A.S. 121 Introduction to Mechanical Engineering
Elective* (Humanities or Social Science)
Ph. Ed. 23 or 24 Physical Education II

Second Term
M.A.S. 202 Engineering Analysis II
M.A.S. 222 Continuum Mechanics
M.A.S. 224 Transport Phenomena
Elective* (Humanities or Social Science)

Second Term
M.A.S. 240 Laboratory and Numerical Science
M.A.S. 204 Mechanical Engineering Systems Design II
Elective (Technical)
Elective (Open)

*An alternate approved sequence is Mathematics 171, 172, 173, 174 for those considered eligible by the Mathematics Department. Students so approved are encouraged to elect this sequence.

*An alternate approved sequence is Physics 117, 118; 127, 128 for those considered eligible by the Physics Department. Students so approved are encouraged to elect this sequence.

*An alternate course is Chemistry 123, 124 for students considered eligible by the Chemistry Department.

*To satisfy the distribution requirements, a student must elect three Humanities courses and three Social Science courses.

*Especially selected students may be permitted to carry one additional elective during each term to a maximum of 36 courses.

201, 202. Engineering Analysis I, II. An introduction to the mathematical analysis of continuous physical systems. Vector analysis and Cartesian tensor analysis. Matrices, with emphasis on eigenvalue problems. Power series solutions of linear differential equations. Sturm-Liouville systems, with emphasis on Fourier series. Partial differential equations and physical processes, including Laplace's equation and equilibrium, the diffusion equation and irreversibility, the wave equation and propagation. Elements of analytic function theory and applications. The theory developed is applied to problems in fluid flow, elasticity, heat conduction, electro-magnetic theory, diffusion theory, quantum mechanics, and magnetohydrodynamics.

203. Mechanical Engineering Systems Design I. Development and application of matrix and integral transformation techniques to solution of natural modes and frequencies and transients in lumped and distributed mechanical, electrical, thermal and mixed linear systems.

204. Mechanical Engineering Systems Design II. Analysis, synthesis and design of closed loop control systems, including steady-state and transient operation, stability criteria and performance design factors. Illustrations from various fields with emphasis on electromechanical and hydraulic systems.


223. Thermodynamics. Systems, states and processes; first and second laws of thermodynamics; thermodynamic potentials and extremal principles; phase changes; power cycles; nonreactive gas mixtures; chemical equilibrium; elements of irreversible thermodynamics.


Basic laws of thermal conduction, steady-state and transient heat conduction in simple geometries; numerical methods for conduction problems; convective transfer, thermal radiation and radiant exchange; radiative transfer in absorbing and emitting gases.


240. Laboratory and Numerical Science. Integrated approach to laboratory experimentation and numerical techniques. Laboratory work of three or four experimental projects from the following areas: fluid dynamics; experimental stress analysis; dynamics and vibrations; thermodynamics and heat transfer; plasma physics. In analysis of experimental results, emphasis on the use of numerical techniques. Lectures cover the following: Nature of approximation, round-off error, propagation of error, introduction to differences, polynomial interpolation, forward and backward differences, least squares curve fitting, special polynomials, data smoothing, Fourier methods, Gaussian quadrature and numerical integration of differential equations. Digital methods stressed; special problems assigned to accompany the lectures.

252, 253. Modern Energy Conversion. A study of the conversion of chemical and nuclear energy into mechanical or electrical energy. The course will range from steam and gas turbine plants through fuel cell thermonuclear and magnetohydrodynamic conversion methods. Subjects such as combustion, heat transfer, and gas dynamics covered as needed.

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.

401, 402. Engineering Analysis III, IV.

412. Laboratory Experiments in Mechanical and Aerospace Sciences.

423. Introduction to Advanced Flight Dynamics.

424. Introduction to Space Vehicle Design.

430. Introduction to Elasticity and Plasticity I.

431. Introduction to Elasticity and Plasticity II.

433. Statistical Mechanics.


The Institute of Optics prepares students for industrial and research positions in optical physics or applied optics. The course of study offers 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 (including lasers), colorimetry, spectrophotometry, and optical properties of thin films.

The curriculum includes basic courses in mathematics, chemistry, and physics, and electives in other fields. By suitable choices of electives in his senior year, the student may prepare himself to go directly into industry or to enter research through graduate work in optics and related areas of physics and engineering. Graduate programs leading to the M.S. and Ph.D. degrees in optics are available.
Four-Year Degree Program

FRESHMAN YEAR
First Term
Math. 161 Analysis I
Phys. 115 Physics I
Chem. 121 General Chemistry I
English Requirement
Ph. Ed. 11 or 12 Physical Education I

Second Term
Math. 162 Analysis II
Phys. 116 Physics I
Chem. 122 General Chemistry II
Elective** (Humanities or Social Science)
Ph. Ed. 13 or 14 Physical Education II

SOPHOMORE YEAR
First Term
Math. 163 Analysis III
Phys. 125 Physics II
Opt. 121 Fundamentals of Optics I
Elective** (Humanities or Social Science)
Ph. Ed. 21 or 22 Physical Education I

Second Term
Math. 164 Analysis IV
Phys. 126 Physics II
Opt. 122 Fundamentals of Optics II
Elective** (Humanities or Social Science)
Ph. Ed. 23 or 24 Physical Education II

JUNIOR YEAR
First Term
Opt. 221 Introduction to Quantum Mechanics and Atomic Structure
E.E. 221 Electronics
E.E. 202 Engineering Analysis II
Elective** (Humanities or Social Science)

Second Term
Opt. 222 Introduction to the Theory of the Solid State
E.E. 201 Engineering Analysis I
Opt. 224 Atomic and Molecular Spectroscopy
Elective** (Humanities or Social Science)

SENIOR YEAR
First Term
Opt. 255 Optics Laboratory I
Opt. 261 Physical Optics I
Elective (Technical)
Elective (Open)

Second Term
Opt. 256 Optics Laboratory II
Opt. 262 Physical Optics II
Elective** (Humanities or Social Science)
Elective (Open)

An alternate approved sequence is Mathematics 171, 172, 173, 174 for those considered eligible by the Mathematics Department.

An alternate approved sequence is Physics 117, 118; 127, 128 for those considered eligible by the Physics Department.

A student may substitute a technical elective with approval of his faculty adviser.

To satisfy the distribution requirements, a student must complete six courses in the humanities and social sciences. At least two courses must be taken in the humanities and at least two in the social sciences.

Especially selected students may be permitted to carry one additional elective during each term for a maximum of 36 courses.
121, 122. Fundamentals of Optics I, II. An introductory survey course in optics. The general aims of the course are to provide a foundation for further studies in optics and to familiarize the student with the scope of the field of optics. Subject matter to be covered includes first order optics, Fermat's principle, thin and thick lenses, mirror optics, basic types of optical instrumentation, sources of optical radiation, photometry, radiation detectors, spectroscopic instrumentation, and photography. During the second semester the emphasis will be on physical optics, interference and diffraction, lasers, and selected topics in areas of current research. Prerequisite: Physics 115, 116 or equivalent; Mathematics 161, 162 or equivalent—Laboratory.

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 behavior. The characteristics of the total visual system as a light-sensing device will be stressed. Prerequisites: Physics 115-116 and Mathematics 161, 162.

221. Introduction to Quantum Mechanics and Atomic Structure. The course will include the special theory of relativity, an introduction to quantum theory and solutions to the Schroedinger equation for simple atomic systems, quantum statistics, and atomic spectroscopy. Prerequisites: Mathematics 164 and Physics 126—Laboratory.

222. Introduction to the Theory of the Solid State. The energy band theory of solids, conduction in solids, thermionic and photoelectric emission, semiconductors, dielectrics, crystalline imperfections, mechanical properties of solids, luminescence, and photoconductivity. Prerequisite: Physics 221.—Laboratory.

224. Atomic and Molecular Spectroscopy. Topics in semiclassical radiation theory, electric dipole selection rules for one electron atom, Russell-Saunders coupling, J-J coupling, vector model of the atom, energy level diagrams of complex atoms and simple molecules. Optical pumping and stimulated emission will be discussed and applied to the theory of lasers. Prerequisite: Optics 221.

241, 242. Geometrical and Instrumental Optics I, II. The rudiments of geometrical optics; ray tracing, aberrations of imaging systems; design of telescopes, microscopes, projection systems; testing of optical instruments using point and line sources, the knife edge test, and interferometry.

251. Advanced Physiological Optics. A detailed discussion of selected topics pertaining to the visual process. Ordinarily given in alternate years. Prerequisite: Optics 152 or permission of the instructor.

252. Colorimetry. A course dealing with the chromatic sensations, color theory, the measurement and specification of color, and the quantitative consideration of color vision. Prerequisite: Physics 125, 126 (or equivalent).

253. Radiometry. The generation, detection, and measurement of optical radiation. Topics include: elementary quantum theory of radiation, generation of coherent and incoherent radiation, propagation of radiation through optical systems, photometry, optical radiation detectors, electrical measurements, photographic measurements, noise limitations in optical measurements, radiometric instruments. Prerequisite: Optics 221.

255, 256. Optics Laboratory I, II. An intensive laboratory course with experiments on optical imaging systems, testing of optical instruments, diffraction, interference, blackbody radiation, lasers, detectors, spectroscopic instruments. Prerequisite or to be taken concurrently: Optics 253 and 256.

257. Technical Photography. 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. Prerequisite: two years of college physics.—Laboratory.

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 radiation; special topics in image structure. Prerequisite: Optics 257.

261, 262. Physical Optics I, II. Maxwell's equations; Liénard-Wiechert potentials; dipole radiation fields; Poynting's theorem; eikonal equation; Kirchhoff diffraction theory; laser mode structure; Fourier methods in optics; holography; modulation transfer function; diffraction of light by crystals; radiation of light by Lorenz atoms; theory of partial coherence and partial polarization; Jones and Mueller calculus; scattering; macroscopic Maxwell theory; reflection and transmission of light by metals and dielectrics; interferometers; crystal optics; non-linear optics; magneto- and electro-optics; relation of classical theory of radiation to quantum theory. Prerequisite: Mechanical and Aerospace Sciences 201, 202 or Electrical Engineering 201, 202.

263. Polarized Light. Theoretical and applied aspects of polarized light including: the production and detection of plane polarized light; propagation of light in anisotropic media; birefringence, pleochroism and optical activity; the detection, measurement and application of elliptical polarization of light.
265. Spectrographs and Interferometers. The design, calibration, and use of grating and prism spectrographs and interference spectrosopes. The design and use of interferometers; interference microscopes; interferometers in metrology.

293. Special Problems in Optics. A reading or research course open to seniors in optics by special permission.

471, 472. The Design of Lenses and Optical Systems I, II.

The Department of Nursing
of the School of Medicine and Dentistry

Administrative Officers

J. Lowell Orbison, M.D. (Northwestern) . . .Dean of the School of Medicine
Eleanor A. Hall, R.N., M.A. (Columbia) . . .Chairman of the Department of Nursing
Virginia M. Brand, R.N., M.A. (Fordham), M.N. (Yale). . . .Associate Chairman for Graduate Studies

The faculty of the Department of Nursing subscribes to the philosophy of the University of Rochester that men and women must have an opportunity to learn and should understand their responsibilities for enlightened leadership as citizens in a changing social order; that liberal education should consist of acquiring the knowledge and skills adequate to conduct a rational and sophisticated search for answers to the major questions which confront man; and that liberal education is basic to professional education and should evoke clarity of thought, direction of purpose, and integrity of character.

The faculty believes that nursing is a useful occupation, a service rendered by one human being for another, or for a group, in which knowledge from the health sciences is applied to the maintenance and restoration of physical and mental well-being and in which the nurse acts in the interests of the person or persons being served.

Education for professional nursing requires a foundation in the physical, biological and social sciences and in the humanities. Upon this base are built educational experiences which help the nursing student acquire the knowledge, skills and understandings necessary to function as a member of the health team and to care for individuals according to their physical, emotional and social needs, fostering for them the greatest possible independence and self-direction. The undergraduate program, leading to the degree Bachelor of Science with a major in Nursing, is designed to prepare for professional nursing practice and to provide a base for graduate education. The curriculum comprises two academic years in the College of Arts and Science or another accredited college, followed by two years and one summer session in the Department of Nursing.

The faculty believes that the professional nurse must respond to the challenge of unresolved problems in nursing by perfecting skills, deepening understandings and contributing to knowledge through service, teaching and research.

Programs of the Department of Nursing are registered with the State Education Department of the University of the State of New York. The undergraduate program is accredited by the National League for Nursing.

Graduates are eligible to take the licensing examination for Registered Nurse in New York State.
FACILITIES FOR INSTRUCTION

Medical Center

The University of Rochester Medical Center consists of the School of Medicine and Dentistry, the Atomic Energy Project and Strong Memorial Hospital. The hospital has accommodations for more than 775 patients and the out-patient services have a daily attendance of approximately 400 patients.

The administrative offices, classrooms, conference rooms, a nursing laboratory and some faculty offices are located in Helen Wood Hall. The amphitheaters, classrooms, conference rooms and laboratories of the School of Medicine and Dentistry and facilities of the River Campus schools are used for instruction. Official and voluntary agencies in Rochester and Monroe County provide instructional opportunities.

ADMISSION

Students who plan to major in nursing should apply for transfer to the Department of Nursing during the last semester of the sophomore year. During their first two years of study, students from other institutions applying for junior standing should seek information about courses which meet admission requirements. They may secure application forms and information concerning admission from the Office of Registrar, Department of Nursing.

Requirements for admission include the successful completion of two years of college study (16 courses at the University of Rochester or 60 or more semester hours at another approved institution), including introductory courses in the following subjects:

- English Composition
- Biology (including laboratory)
- Microbiology (including laboratory)
- Psychology
- Chemistry (2 semesters, including laboratory)
- Sociology (2 semesters)

The program should include at least three additional courses in the humanities, two additional courses in the social sciences, and remaining electives distributed among the humanities, social sciences and natural sciences. Vocational courses and physical education courses required in the college attended are not accepted as fulfilling admission requirements.

The Department also requires a minimum grade average of "C" for all course work taken prior to admission, a satisfactory health record and a strong desire to make nursing a career, together with evidence of aptitude for such a career.

Registered nurses who wish to work toward the baccalaureate degree must have achieved junior standing. The opportunity to achieve advanced placement in the Department of Nursing through examination is available and must be arranged during the year prior to enrollment in the Department of Nursing. If achievement on a test
does not meet the standard set by the faculty, the student is required
to enroll in the course and complete it satisfactorily.

Students, especially those taking part-time work over a period of
time, are advised to check periodically regarding degree requirements
and the acceptability of courses to be offered for admission to the
nursing major.

THE BASIC PROGRAM

The program offered in the Department of Nursing consists of the
following courses:

JUNIOR YEAR

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Fall</th>
<th>Spring</th>
<th>Summer</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUR 200</td>
<td>Fundamentals of Nursing Practice</td>
<td>5</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>NUR 209</td>
<td>Human Development and Behavior</td>
<td>4</td>
<td></td>
<td></td>
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<tr>
<td>NUR 210</td>
<td>Nutrition</td>
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<tr>
<td>NUR 211</td>
<td>Human Anatomy and Physiology I</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NUR 212</td>
<td>Human Anatomy and Physiology II</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NUR 214</td>
<td>Pharmacology</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NUR 249</td>
<td>Nursing Care of Adults and Children I</td>
<td>9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NUR 250</td>
<td>Nursing Care of Adults and Children II</td>
<td></td>
<td>8</td>
<td></td>
</tr>
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</table>

| Total       |                                      | 16   | 16     | 8      |

SENIOR YEAR

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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</tr>
</thead>
<tbody>
<tr>
<td>NUR 251</td>
<td>Maternity Nursing</td>
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<td>NUR 252</td>
<td>Public Health Nursing</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>NUR 253</td>
<td>Basic Concepts of Psychiatric Nursing</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>NUR 254</td>
<td>Nursing Leadership</td>
<td>8</td>
<td></td>
</tr>
</tbody>
</table>

| Total       |                                      | 16   | 16     |

The degree is granted on recommendation of the faculty in nursing.
upon completion of general University requirements and a minimum
of 132 semester hours of course work with at least a "C" average in
all work taken as well as an average grade of "C" in the nursing
major.
Requirement for Bachelor’s Degree with Distinction

The Bachelor’s degree is awarded in three grades of distinction: with distinction, with high distinction and with highest distinction. This award is based primarily on a cumulative average of at least 3.25 for distinction, 3.60 for high distinction and 3.85 for highest distinction.

Except in unusual cases no student is considered for a degree with distinction without at least two years of academic work at the University of Rochester.

TUITION AND FEES (1968-1969)

<table>
<thead>
<tr>
<th>YEAR</th>
<th>First Term</th>
<th>Second Term</th>
<th>Summer</th>
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</thead>
<tbody>
<tr>
<td>JUNIOR</td>
<td>$750.00</td>
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<tr>
<td>Tuition</td>
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<td>225.00</td>
<td>90.00</td>
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<tr>
<td>Room</td>
<td>247.50</td>
<td>247.50</td>
<td>100.00</td>
</tr>
<tr>
<td>Meals</td>
<td>20.00</td>
<td>20.00</td>
<td>5.00</td>
</tr>
<tr>
<td>Health Fee</td>
<td>12.50</td>
<td>12.50</td>
<td></td>
</tr>
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</table>

$1255.00 $1255.00 $445.00

<table>
<thead>
<tr>
<th>YEAR</th>
<th>First Term</th>
<th>Second Term</th>
<th></th>
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</thead>
<tbody>
<tr>
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<td>12.50</td>
<td></td>
</tr>
</tbody>
</table>

$1255.00 $1255.00

OTHER EXPENSES

Students transferring from another University must pay an application fee of $15. Uniforms cost approximately $75 at the beginning of the junior year. Books, field trips and miscellaneous expenses associated with community experiences including cost of transportation and meals are approximately $100 a year. The insurance premium for Extended Medical Care is $17 a year.
FINANCIAL AID

The University's Financial Aid Program is described elsewhere in this bulletin. Applications may be secured from the Office of the Registrar, Department of Nursing, or from the Office of the Director of Admissions and Student Aid, River Campus.

Federal Assistance Programs

The United States Army and Navy Nurse Corps sponsor programs through which financial assistance is provided for the last year or two of the undergraduate program. A student who participates 12 months or less serves on active duty in the respective service for 24 months. If two years support is given, she serves 36 months. Information may be obtained from the recruitment office of each service.

The University of Rochester is one of 23 colleges and universities selected to participate in the Navy Enlisted Nursing Education Program. Under this arrangement, enlisted corpsmen are chosen by the Navy to study nursing and are directed to apply for admission. If admitted, these students participate in the NENEP throughout the course of study.

Training stipends are available through the National Institute of Mental Health for undergraduate students at the junior or senior year. Students must have special aptitude for psychiatric nursing and plan to pursue graduate study in this field.

Tuition Benefits

Registered nurses holding full-time appointments at the University Medical Center are entitled to tuition aid for part-time study (up to 8 credit hours per semester). Inquiries concerning positions should be addressed to Director of Nursing Service, University of Rochester Medical Center.

STUDENT RESIDENCE

Full-time students in the Department of Nursing, except local students who live at home, live in Helen Wood Hall at the Medical Center. Helen Wood Hall is a four-story building connected by tunnel with other parts of the Medical Center. This building has a large living room, several small reception rooms, lounges for informal gatherings, kitchenettes, sun porches, laundry and sewing room. All rooms are furnished; the majority are single. The spacious grounds, gardens and adjoining tennis courts add to the pleasant and homelike atmosphere in this residence. Bus lines provide quick transportation to other parts of the campus and to the center of the city.

Undergraduate students in the Department of Nursing are governed by a Student Association made up of student-elected officers, class representatives, faculty advisers, Residence Director and assistants and the Chairman of the Department of Nursing, ex officio. Numerous activities are sponsored by the Association, and students are encouraged to take advantage of the social and cultural resources of the University and of the community.
200. Fundamentals of Nursing Practice. An introduction to the functions and responsibilities of the professional nurse. Application of theory and skills to the identification and solution of patient care problems.—Credit—five hours. Fall term.

209. Human Development and Behavior. The study of physical and psycho-social factors from birth to senescence which influence behavior, with particular application to the practice of nursing.—Credit—four hours. Fall term.

210. Nutrition. A study of the fundamentals of nutrition based on current scientific knowledge. Biochemistry is an integral part, as it relates to the utilization of nutrients by the human organism.—Credit—three hours. Fall term.

211. Human Anatomy and Physiology I. The normal gross and microscopic structure and the function of the human body are presented through lectures, laboratories, demonstrations and conferences. Included are basic concepts of pathology necessary for the understanding of human disease.—Credit—four hours. Fall term.

212. Human Anatomy and Physiology II. A continuation of Human Anatomy and Physiology I.—Credit—four hours. Spring term.

214. Pharmacology. The origin, preparation, dosage, action, therapeutic use and toxic effects of drugs commonly used with emphasis on the nurse’s responsibilities in relation to drugs.—Credit—three hours. Spring term.

249. Nursing Care of Adults and Children I. In the classroom and in the clinical area students learn to identify the nursing needs of adults and children with acute and long term conditions and to develop, implement, and evaluate a plan of nursing care compatible with the medical regimen.—Credit—nine hours. Spring term.

250. Nursing Care of Adults and Children II. A continuation of Nursing Care of Adults and Children I with emphasis on long term and chronic conditions. Students explore in depth selected nursing care problems.—Credit—eight hours. Summer term.
251. Maternity Nursing. The identification of individuals' and families' needs throughout the maternity cycle; the development, implementation, and evaluation of plans for nursing care. Knowledge and skills are gained in the classroom and the clinical setting.—Credit—eight hours. Fall and Spring terms.

252. Public Health Nursing. The basic principles underlying public health and public health nursing are explored with emphasis on the prevention of disease and disability and the promotion of health among families and in communities. Community public health nursing programs provide the laboratory experiences in this course.—Credit—eight hours. Fall and Spring terms.

253. Basic Concepts of Psychiatric Nursing. Mental illness as an individual, family, and community problem is examined and the student provided with experiences in selected settings which enable her to develop skills and understandings pertinent to the nursing care of patients. Emphasis is placed on the relationships between the nurse, the individual patient, and groups of patients. Nursing roles and trends in psychiatric nursing are explored.—Credit—eight hours. Fall and Spring terms.

254. Nursing Leadership. A study of leadership theory and practice that considers problems within or related to clinical nursing and the nursing profession. Students are involved in leadership roles in providing nursing care to groups of patients. They investigate and analyze issues and trends in the provision and delivery of nursing care to people in institutions and the wider community.—Credit—eight hours. Fall and Spring terms.
Faculty

Eleanor Hall, R.N., M.A. (Columbia) ... Professor of Nursing
Virginia Brantl, R.N., M.A. (Fordham), M.N. (Yale) ... Professor of Nursing
Rita Chisholm, R.N., M.A. (Columbia) ... Associate Professor of Nursing
Josephine Craytor, R.N., M.S. (Rochester) ... Associate Professor of Nursing (Medical-Surgical)
Florence Dunn, R.N., M.A. (Columbia) ... Associate Professor of Nursing Education
Edith Olson, R.N., M.S. (Hunter) ... Associate Professor of Nursing (Medical-Surgical)
Marjorie Pfaudler, R.N., M.A. (Columbia) ... Associate Professor of Nursing (Rehabilitation) and Preventive Medicine and Community Health
Mary Wemett, R.N., M.S. (Rochester) ... Associate Professor of Nursing (Medical-Surgical)
Sylvia Ajemian, R.N., M.S. (Colorado) ... Assistant Professor of Nursing (Medical-Surgical)
Joan Hoffmann, R.N., PH.D. (Illinois) ... Assistant Professor of Nursing and Physiology
*Leila Hopkins, M.S. (Iowa) ... Assistant Professor of Nursing (Nutrition)
Shirley Joseph, PH.D. (Rochester) ... Assistant Professor of Nursing and Anatomy
Edward Mongan, M.D. (Cornell) ... Assistant Professor of Medicine and Nursing
Rose Pinneo, R.N., M.S. (Pennsylvania) ... Assistant Professor of Nursing (Medical-Surgical)
John Racy, M.D. (Beirut) ... Assistant Professor of Psychiatry and Nursing
Marilyn Svejda, R.N., M.S. (Indiana) ... Assistant Professor of Nursing (Pediatric)
Virginia Wandover, R.N., M.S. (Western Reserve) ... Assistant Professor of Nursing (Medical-Surgical)
Kirstan Burke, R.N., M.S. (Catholic University) ... Instructor in Nursing (Mental Health–Psychiatric)
Ann Fenton, R.N., M.S. (Pennsylvania) ... Instructor in Nursing (Medical-Surgical)
Elizabeth Fraser, R.N., M.S. (Rochester) ... Instructor in Nursing (Medical-Surgical)
Janet Long, R.N., M.S. (Rochester) ... Instructor in Nursing (Medical-Surgical)
Joan Lynaugh, R.N., M.S. (Rochester) ... Instructor in Nursing (Medical-Surgical)
Helen McNerney, R.N., M.S. (Rochester) ... Instructor in Nursing (Public Health)
*Winifred Nelson, R.N., CNM, B.S. (Nebraska) ... Instructor in Nursing (Maternity)
Diane O’Leary, R.N., M.S. (Rochester) ... Instructor in Nursing (Maternity)
Shirley Oscarson, R.N., M.N.Ed. (Pittsburgh) ... Instructor in Nursing (Maternity)
Cornelia Porter, R.N., M.N.Ed. (Pittsburgh) ... Instructor in Nursing (Pediatric)
Maryann Pranulis, R.N., M.S.N. (Yale) ... Instructor in Nursing (Mental Health–Psychiatric)
Carla Schissel, R.N., M.S. (Maryland) ... Instructor in Nursing (Medical-Surgical)
Judith Sullivan, R.N., M.S. (Western Reserve) ... Instructor in Nursing (Public Health)
A. Elizabeth Crozier, M.A. (Columbia) ... Clinical Assistant Professor of Nursing (Nutrition) and Assistant Director Dietary Department
John Hill, Ph.D. (Bryn Mawr) ... Clinical Associate in Preventive Medicine and Community Health and Nursing
Walter Wenkett, M.P.H. (Yale) ... Clinical Associate in Preventive Medicine and Community Health and Nursing
Dorothy Jarvis, R.N., M.S. (Boston) ... Clinical Instructor in Nursing and Supervisor, Intensive Care Unit
Marion Nichols, R.N. ... Clinical Instructor in Nursing and Supervisor, Obstetrics
Patricia Spencer, R.N., M.S. (Columbia) ... Clinical Instructor in Nursing and Supervisor, Pediatrics
Tamara Barlow, R.N., B.S. (Rochester) ... Clinical Assistant in Nursing and Head Nurse in Preventive and Community Psychiatry

*Part-time
ADVISING PROGRAM

All aspects of the student's academic program planning and review are the concern of the academic Deans of the Colleges. During the freshman and sophomore years, each student has an assigned faculty adviser who is available to help him work out a suitable academic program and evaluate various possibilities for an area of concentration. Candidates for the B.A. degree will normally have an adviser whose interests match the expressed preference of the student. Candidates for the Bachelor of Science degree are assigned to advisers from areas of instruction offering that degree. All students are urged to consult their advisers prior to scheduled pre-registration periods. The adviser's signature is required on all registration forms and on all requests for changes in registration and for exceptions to the College regulations.

During the Summer Orientation Program each freshman meets with a member of the faculty to plan and pre-register for a fall program of courses. Early in the fall semester each freshman will have the opportunity to meet with his assigned faculty adviser.

At the end of the sophomore year, once the student has been accepted by the department or college in which he chooses to major, he is assigned an adviser from that area of concentration. Students who transfer from the College of Arts and Science to other River Campus Colleges and the Department of Nursing will be assigned an adviser in those areas.

REGISTRATION

In April and December, the Registrar distributes forms and materials essential for registration and payment of fees for the following semester for students currently enrolled. Registration dates for these periods are noted on the University calendar. Registration materials are mailed to transfer students and re-admits in August and December. At a Summer Orientation Program on campus each freshman is given registration materials and the opportunity to plan his program with a member of the faculty.

Registration is considered to be completed only when course programs with any necessary approvals are filed with the Registrar and the semester bill has been paid.

The Registrar also advises students on matters relating to Selective Service. As a part of the registration procedure, students are required by Selective Service to complete a deferment request which is verified and transmitted to the local Draft Boards. The Registrar will send a Selective Service Form 109 to local draft boards only at the request of the student.
Honors Seminars: Requests forms for Honors Seminars may be obtained at the Program Advising Office, Morey Hall.

Applied Music: Students registering for courses in Applied Music should consult the special requirements described in the music section of the Bulletin and file the necessary forms available from the Registrar.

Audit: Full-time students may audit a course without credit at no extra cost. Permission of the instructor is necessary. Audited courses are not recorded on the student's permanent academic record.

ROTC Credit: A maximum of three courses in Aerospace Studies and in Naval Science may be counted toward the degree.

BACHELOR'S DEGREE WITH DISTINCTION
Bachelor degrees are awarded in three grades of distinction: with distinction, with high distinction and with highest distinction in the departmental major.

In the College of Arts and Science students interested in receiving degrees with distinction should inquire at the department early in the senior year.

Degrees with Honors are earned by participation in the Honors Program. Individual departments determine the criteria.

EXCEPTIONS TO THE RULES: STUDENT PETITIONS
The faculty of each College establishes the requirements for degrees. The faculty recognizes that there are instances in which interpretations are required and exceptions should be made. An elected committee of the faculty, the Administrative Committee, serves to review requests for exceptions to faculty regulations.

Students seeking exceptions to regulations must submit a written petition to the College office, for review by the Administrative Committee of the College. The petition should include a recommendation from the student's adviser. The student will be informed in writing of the Committee's action.

COLLEGE OFFICES (for Academic Information)
College of Arts and Science—Program Advising Office, Morey Hall
College of Engineering and Applied Science—Office of Assistant Dean, Gavett Hall
College of Education—Office of Dir. of Academic Advising, Taylor Hall
College of Business Administration—Academic Office, Dewey Hall
Department of Nursing—Office of Registrar, Helen Wood Hall

SUMMER SCHOOL APPROVAL
Credit for summer work requires prior approval from the department offering comparable work in the College in which the student is enrolled. Approval forms are available at the appropriate college office. Approved summer work completed at institutions other than the University of Rochester with a grade of "C" or better is recorded in terms of course credit, no letter grade is recorded or used in computing the student's cumulative average.
UNIVERSITY SCHOOL COURSE APPROVAL

A student may elect only those University School courses that are comparable to those offered in the college in which the student is registered and only when the desired course is otherwise unavailable. Prior approval of the department and the Dean of the College is required. Approval forms are available at the appropriate college office (see College Offices).

COURSE CHANGES

In the College of Arts and Science and College of Education during the first four weeks of a semester, a student may change his course registration (drop, add, or both) without penalty providing he has the approval of the relevant instructors and his adviser. If such a change results in a total registration of fewer or more than four credit courses, it is subject to the provisions governing Underloads and Overloads.

After the fourth week of each semester, no changes in registration shall normally be permitted. Exceptions to this rule may be made only with the approval of the instructor involved, the faculty adviser, and the Dean of the College.

The allowable time interval for course changes in the other River Campus Colleges is seven weeks.

Forms necessary for authorizing change of courses (drop-add) are available at the appropriate college office (see College Offices).

OVERLOAD—UNDERLOAD

Normally, a semester's program consists of four courses. Except for degree programs which specifically require it, programs of more or fewer than four courses must be approved by the Dean of the College before pre-registration. Such approval must be requested in a written petition, formally endorsed by the faculty adviser. Forms are available at the appropriate college office (see College Offices). Permission is not required to enroll in an additional course which carries half credit or for courses which are a normal part of the Naval or Air Force ROTC programs.

Permission for a fifth course is granted only to superior students, normally those with a grade average of 3.0 and higher. Unless specified as part of an academic program, the fifth course must be carried for “enrichment” purposes only. That is, overloads may be taken to provide a more meaningful semester's work and may not be taken to reduce the residence requirement for the degree. First semester freshmen may not take a fifth course; no student is permitted a sixth course.

GRADING SYSTEM

The grade of "I" awarded at the instructor’s discretion under special circumstances indicates that a course has not been completed or that permission has been granted to postpone the final examination. If not removed by the end of the ensuing semester or in certain cases by an earlier completion date it automatically becomes "E". For extension of the completion date students must petition the Dean of the College by letter. All such requests must be endorsed by the instructor.

Cumulative averages are computed on a scale of 4.0, where 4.0 is "A", 3.5 is "B +", 3.0 is "B", 2.5 is "C +", 2.0 is "C", 1.5 is "D +", 1.0 is "D", and 0.0 is "E".

ABSENCE FROM CLASS
Travel with an authorized extracurricular group may involve occasional absence from classes. Students should make their own arrangements with instructors; coaches and group advisers may use form letters to certify the reason for absence.

Students who are hospitalized or confined to the Infirmary will receive from the Health Service a statement validating the period of confinement. Any illness resulting in absence should be reported promptly to the Health Service even though the student is under treatment by another physician. The College offices maintain lists of all students whose medical status, as reported by the Health Service, may impair their capability to do academic work.

DEAN’S LIST
Each semester a list of those students who have achieved a 3.0 average is announced by the Dean of the College.

GOOD STANDING IN THE UNIVERSITY
The continuance of each student upon the rolls of the University, his receipt of academic grades, his graduation, or the conferring of any degrees or the granting of any certificate, is strictly subject to the discretionary powers of the University. Each student concedes to the University the right to require his withdrawal at any time for any reason, and no reason for requiring such withdrawal need be given.

ACADEMIC ACTIONS: Probation and Separation
The College regularly reviews the academic progress of its registered students. Those not making satisfactory progress towards completion of degree requirements are either placed on academic probation or separated from the College. Satisfactory progress normally connotes:

1. A cumulative average of at least 2.0 and an average in the term just completed of at least 2.0, and for juniors and seniors the attainment of grades of "C" or better in the field of concentration.

2. An absence of failing grades.

3. Successful completion of work undertaken, avoiding grade "I".
4. Acceptance into a program of concentration in a department of the College of Arts and Science, or in another River Campus College, or the Department of Nursing at the end of the sophomore year (or the end of the semester in which the student completes at least 16 courses).

Although not excluded from extracurricular activities a student on probation is advised to budget time and energy carefully. Unless he shows significant improvement in the semester following probationary action, separation from the College may be expected.

Separation and probation are reviewed only when new evidence bearing on the case is presented in writing to the Dean of the College.

WITHDRAWAL
A student is permitted to withdraw from the University by submitting a request in writing to the Office of the Dean of the College.

ACADEMIC HONESTY
Two of the chief purposes of education are to develop the intelligence of the student and to instill in him a sense of moral responsibility for his own actions. Accordingly, each student is expected to perform all of his required work without improper or unauthorized help. Cheating or plagiarism is a concern not only of the student and the professor involved, but of the entire University.

The academic community has an "honor code." Cheating is equally dishonorable whether or not a proctor is present and whether or not the student who cheated has signed a pledge of honesty. The seriousness of cheating is measured by the degree of premaditation, the extent to which the act is intended to deceive the professor, whether the action injures others and whether the offense is repeated.

The University Board on Academic Honesty, appointed by the Provost, consists of an academic administrator as Chairman and two faculty members. It has jurisdiction over all undergraduates.

A faculty member or proctor who discovers a probable case of academic dishonesty should speak to the student suspected, presenting his views of the facts and obtaining the student's. Unless the matter proves to be clearly a misapprehension, a pertinently documented report of the incident should be sent to the Chairman of the Board on Academic Honesty. The student should be informed by the Board that a report has been received and of his right to submit a statement in writing.

Disciplinary action in cases of suspected academic dishonesty should emanate from the proceedings of the Board, not from faculty members or proctors. When a report is received by the Chairman of the Board on Academic Honesty he reviews the student's entire file and decides when a charge of academic dishonesty should be brought against the student. After due notice to the student, the Board, augmented by the Dean (or his representative) of the student's college, hears and decides the case, giving the student fair opportunity to defend himself against the charge.
The Board forwards its findings, the complete file on the student, and its recommendation for action to the Dean of the College. The files and proceedings of the Board will be confidential and will be available only to the Board, the President, the Provost, and the Dean, or to other officers designated by them, except that they may be shown to the student for his use in defending himself and the penalties may become a part of the Registrar’s official records. Appeals from penalties imposed by the Dean may be made to the Provost.

**PREPARATION FOR GRADUATE AND 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 years to plan programs of study that will prepare them for advanced and professional training in their chosen fields.

**Medicine**

Medical schools expect candidates to have a broad education and a solid base in science. “Pre-Med” is not in itself a major, and the pre-medical student should plan to complete a regular concentration program which need not be in the sciences.

Although medical schools vary in their admission requirements, the following courses are recommended: Biology, 1 year; Inorganic Chemistry, 1 year; Organic Chemistry, 1 year; Physics, 1 year. Additional courses in Biology, Chemistry and Mathematics are desirable. Students should plan to meet the requirements of those schools to which they will apply. Medical School Admission Requirements (Association of American Medical Colleges, 2530 Ridge Avenue, Evanston, Ill.) covering all American and Canadian medical schools may be purchased at the University Bookstore or from the publishers. A copy is available for reference in the Placement Office in the Men’s Dining Center.

Early in the junior year pre-medical students should initiate a file for the Pre-Medical Advisory Committee at the Program Advising Office, Morey 316. The student has the responsibility for providing the names of faculty members familiar enough with his academic ability to speak in support of his application.

On the basis of an interview with a member of the Committee early in the senior year and the materials in the pre-med file, a letter is drafted by the Committee to be sent in support of the student’s application to those medical schools where the student makes formal application.

A capable and mature student may be admitted to medical school after three years of college work. Arrangements may be made for the first year’s work in medical school to count as the fourth year’s work in the College (see “Senior Year in Absentia”).
The Medical College Acceptance Test should be taken early in the senior year and is arranged through the University Counseling and Special Services Office. Course work representing the minimum requirement should be completed before taking the MCAT.

New York State residents planning to compete for Medicine and Dentistry Regents Scholarships must complete organic chemistry by the end of the junior year (sophomore year for three-year students).

**Dentistry**

Recommendations for pre-medical study also apply for pre-dental students. Some dental schools, however, admit students upon completion of two years of college work, and the course requirements are somewhat less stringent. To assist their program planning students should consult dental school catalogues and *Admission Requirements of American Dental Schools* (American Association of Dental Schools, 211 East Chicago Avenue, Chicago, Ill.). A copy is available for reference in the Placement Office in the Men's Dining Center.

The Pre-Medical Advisory Committee also assists the pre-dental student in making his applications; the student's responsibilities are the same. He should consult the University Counseling and Special Services Office for dates of the appropriate examination.

**Law**

The pre-law student should plan a regular concentration program in the College. Political Science, Economics or History are the most commonly chosen major fields, but many others are acceptable. A year's work in Accounting and basic study in both Political Science and Economics are recommended for the preparatory program. The student should check the catalogues of schools in which he is interested.

Students should consult with the Pre-Law Adviser and the University Counseling and Special Services Office to determine appropriate dates for taking the Law School Admission Test.

**OFFICER CANDIDATE PROGRAMS**

**Air Force Reserve Officers' Training Corps**

The Air Force ROTC prepares students to qualify for a commission in the U.S. Air Force upon completion of degree requirements.

The training program is conducted by personnel assigned to the Air Force and to the University, where they are organized as Air Force ROTC Detachment 580 and the Department of Aerospace Studies.

The Professional Officer Course is open to qualified students with two academic years remaining before the baccalaureate or graduate degree. Enrollment is on a selective and competitive basis. To qualify a student must pass the Air Force Officers Qualifying Test and be: (1) a male citizen of the United States, (2) at least 17 years of age at the time of acceptance, (3) of sound physical condition, (4) accepted by an interview board, (5) of good moral character. Candidates must also complete a six-week Field Training Course at an Air Force Base.
A student accepted for this program must earn a degree and participate in three classroom hours of instruction each week for the two academic years. He must also agree to accept, if offered, a commission in the United States Air Force, to serve for a period of not less than four years on active duty (five years if an applicant for pilot or navigator training) and to join the Air Force Reserve for a period of six years. Membership in this Reserve status is creditable toward meeting the required minimum service obligation under the Universal Military Training and Service Act. Students fully enrolled in the Professional Officer Course are classified ID, draft deferred status, and receive $40 subsistence pay a month.

The Air Force also offers a flight instruction program of 36 1/2 hours of flight training and 30 hours of ground training to eligible applicants who are in their second year of the Professional Officer Course. Successful completion of this program and passage of FAA examinations qualify the student for a private pilot's license.

Consult Aerospace studies for course descriptions.

**Naval Reserve Officers' Training Corps**

The University of Rochester has had a permanent Naval Reserve Officers' Training Corps on campus since 1946. Harkness Hall, named after an alumnus, Admiral William Harkness, Class of 1858, was the first building devoted entirely to Naval Science to be constructed on any campus, except at the U.S. Naval Academy. The Department of Naval Science, the College of Arts and Science, is chaired by the Professor of Naval Science, a senior Naval or Marine Officer, with a staff of Navy and Marine Officers and non-commissioned officers.

Requirements for male students desiring an officer's commission in the U.S. Navy or U.S. Marine Corps (optional) are: (1) enrollment in one of the three program categories, Regular, Four-Year Contract or Two-Year Contract; (2) baccalaureate or higher degree; (3) complete Naval Science courses (page 114).

Students participate in the NROTC Program in three categories:

1. **Regular NROTC students** are selected by national competition. Applications must be mailed by early November the year before entering college as a freshman. Students are subsidized by the Navy for tuition, fees, textbooks, uniforms and subsistence allowance of $600 a year. They are obligated to attend three cruises or summer training periods of six to eight weeks, to accept a commission as Ensign, USN, or Second Lieutenant, USMC, upon graduation and to serve on active duty at the discretion of the President as career officers in the U.S. Navy or Marine Corps. Depending upon the needs of the service, the Secretary of the Navy may accept resignations from officers of the Regular Naval Service who serve a minimum of four years on active duty and do not wish to continue on active duty as career officers.

2. **Four-Year Contract students** are selected by the Chairman of the Department of Naval Science from the incoming freshman class at the
beginning of the fall semester. The Chairman selects from among the sophomores those considered eligible to complete the Naval Science requirements for an officer's commission.

Each Contract student selected is required to sign a contract with the Secretary of the Navy which includes the following: (a) agreement to serve on active duty for three years after receiving his commission; (b) agreement to retain that commission until the sixth anniversary of receipt of his original commission as an officer in the U. S. Naval or Marine Corps Reserve; (c) upon completion of active duty, to be placed on active duty in the Ready Reserve, if eligible. Ready Reserve service is for a period which, when added to active duty, will total five years. Upon completion of this five years of satisfactory service on active duty and in the Ready Reserve, to be transferred to the Standby Reserve for the remaining portion of the service obligation.

This contract requires the selectee's signature, and the signature of his parent or guardian if he is under 21 years of age.

A limited number of highly motivated students may be selected even though their visual acuity is less than normally required.

3. Two-year Contract students are selected by the Chairman from among the applicants who are sophomores or who have two years of study remaining at the University of Rochester (including two summers) prior to receiving a baccalaureate or higher degree. The student selected for the Two-Year Program must attend a Naval Science institution for about six weeks during the months of July and/or August at selected regional NROTC colleges. Tuition, room, board, travel expenses, and modest subsistence are provided. In the fall, these students assume the same obligations as other Contract students prior to being selected to continue Naval Science courses.

The Two-Year Contract program has six options for eventual commissioning: Surface as an unrestricted Line officer in the U. S. Naval Reserve; Aviation as an unrestricted line officer programmed toward eventual designation as a naval aviator; Marine as an officer in the U. S. Marine Corps Reserve; Supply as a supply officer in the U. S. Naval Reserve; Science and Engineering in the restricted line—open to students enrolled in physical science or engineering curricula who are not physically qualified for the surface option; Law as an unrestricted line officer and redesignation as a law officer upon completion of a law degree, successful completion of the bar examination, and admission to the bar.

All students enrolled in the NROTC may take a Flight Indoctrination Program (FIP) provided they meet mental and physical requirements. Two-Year Contract students who desire to become aviators are required to complete the FIP program.

Eligibility for Regular NROTC students: Successful completion of competitive requirements prior to freshman year; Contract students enrolled in college are eligible to enter the competition, and if successful can become Regular students; remain unmarried.
Eligibility for Four-Year Contract students: Married or unmarried; at least 17 years of age and no more than 21 years of age by June 30 of the year enrolled (mature students of 16 years may be accepted); physically qualified; visual acuity of 20/20 without correction (waivers to 20/40 correctible to 20/20 for motivated students with high scholastic qualifications—a limited number of students with visual acuity of 20/100 may be selected for the contract program in Science and Engineering).

Eligibility for Two-Year Contract students: Married or unmarried; at least 18 years of age and no more than 25 years on June 30th of the year he will receive a baccalaureate; physically qualified; visual acuity of 20/20 required for certain Navy assignments (waivers up to 20/200 are possible).

Students in either of the Contract Programs receive uniforms, Naval Science textbooks and $50 per month subsistence allowance during the two years preceding commissioning.

Students in either of the Contract Programs are required to take summer training cruises with the U. S. Navy (or U. S. Marine Corps—optional) the summer prior to their last academic year. While on cruise they receive the pay of a midshipman ($151.95 per month), travel and transportation, meals and quarters.

Naval Science students.

Any student in the University may take courses from the Naval Science curriculum with the approval of the Professor of Naval Science and the approval of the college or department of his major. These students are designated Naval Science Students. These students are not eligible for summer training cruises, uniforms, compensation or other benefits. Male students may become eligible for either of the Contract Programs or may compete for the Regular Programs. Credits for Naval Science courses are determined by the College in which the student is pursuing his major.
Student Life

A flexible program of activities has been developed to meet the varying interests of the student body. Opportunities are offered to develop both vocational and avocational interests and to acquire leadership skills.

Todd Union, the Student Activities building, provides popular gathering places for students in its snack bar and main lounges. As the center of an organized activities program, it houses offices of student government, college publications, the campus radio station and is the headquarters for dramatics, music and religious organizations. Rooms are available for meetings and social events. Student mailboxes and a branch of the United States Post Office are located on the ground floor in Todd Union.
Freshman Week

Freshman Week is designed to familiarize new students with all aspects of student life at the University. Over a period of a few days new students are briefed on the University's academic expectations, meet faculty and administrative personnel and are familiarized with the "college way of life" and the physical layout of the campus.
RESIDENCE HALLS

All full-time River Campus students, except local students who live at home, must reside on campus unless excused by the Dean of Student Life. Freshmen must live in the residence halls; upperclassmen, in the residence halls or fraternity houses. All students living in undergraduate residence halls are on the University's Board Plan. Each resident unit includes attractive dining facilities. Detailed information regarding the residence halls accompanies the room application, which is mailed on payment of the entrance deposit fee. Questions about residence halls should be addressed to the Associate Director of Residence Halls for Men or Women.

Selected graduate students live in the residence halls as head residents. They are aided by specially chosen upperclassmen who serve as resident advisers. Close contact is maintained between the residence advisers and other counselors. Residence hall advisers help individual students with minor problems pertaining to activities and social affairs, direct students to other advisory agencies in the University and develop the atmosphere of the individual halls to reflect the social and intellectual spirit of the University. Advisory programs within the halls are coordinated by the Associate Directors of Residence Halls for Men and Women, respectively.

Full-time students in the Department of Nursing, except local students who live at home, live in Helen Wood Hall.

All phases of residence hall living, including standards and regulations for men and women are under the jurisdiction of the Residence Halls Government. This body is composed of an executive board, elected corridor representatives, and standing committees. The University entrusts to students the primary responsibility for developing and administering their own rules in matters of conduct and community life. Infractions of these regulations are reviewed by the Student Judicial Board.

Throughout the year there is a full calendar of social events such as traditional women's college suppers, conferences, faculty coffee hours, formal and informal dances and parties, teas and receptions, picnics, open houses, game nights and sports competitions.

Each residence hall operates 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 residents' social life and conduct. Within the residence halls are recreation rooms, snack bars and lounges for group and individual use. Other facilities include typing rooms, kitchenettes, laundry equipment, and a solarium and sun deck for use of women students on the seventh floor of the Women's Residence Halls.

Founders Court

Anderson Tower, Wilder Tower, and Sage Dining Hall comprise a residential-dining complex which accommodates about 500 junior and senior men and women. Emphasizing the concept of community
living, these halls also permit the University to provide housing for a few faculty families.

Accommodations for students in Anderson and Wilder Towers are arranged in six-person suites providing a lounge, individual rooms and a bath for each unit. Junior and senior men and women students live on separate floors. Faculty apartments are located on the main floor and on floors four and seven in each hall.

Sage Dining Hall, designed to permit small group dining, serves residents of Anderson and Wilder Towers. Students are expected to dress in good taste for meals.

THE STUDENTS' ASSOCIATION

Every full-time undergraduate student on the River Campus is a member of the Students' Association, which is governed by an Executive Committee of five, a Cabinet of 24 elected student delegates, and an all-campus Judicial Board of nine students appointed by the cabinet. The Students' Association has general responsibility for the development and supervision of extracurricular activities and for maintaining high standards of student life.

Several of the major policy-making groups, responsible to the College Cabinet, include both student and staff membership. The Extracurricular Policy Board (EPB) oversees the total activities program, establishes the yearly student activities calendar, helps new interest groups become organized, evaluates programs offered and works to assure a balanced, coordinated program throughout the year. The Finance Board (CCFB) has sole responsibility for allocating the activities budget of approximately $150,000 to all campus student groups. The All-Campus Judicial Board, comprised of seven carefully selected sophomore, junior and senior students, exercises primary judicial responsibility for all disciplinary review matters, excepting those involved in academic integrity. This Board also serves as an Appellate Body for the lower Judicial Boards of the respective resident areas. The Committee on Educational Policy (C.E.P.), appointed by College Cabinet, is responsible for initiating recommendations on academic
matters and maintaining liaison with faculty, academic committees of the River Campus.

**Communications and Publications:** In publications, students obtain editorial, business and advertising experience. Publications are the *Campus Times*, a semi-weekly newspaper; *Contrast*, a monthly publication featuring news in depth; *Interpres*, a yearbook, edited by the Junior Class; *Prologue*, a semi-annual literary magazine; *Ugh-Renegade*, a semi-annual humor magazine; a Freshman Directory; a handbook and chronicle; and the Engineering students' monthly newsletter, *Rochester Indicator*. Two radio groups, WRUR, the student-operated AM-FM station, and the Amateur Radio Club (K2ZWI), offer students experience in broadcast announcing and engineering.

**Drama:** Drama groups include the Stagers, an organization which presents two plays a year under the direction of a faculty member; Experiment '67, an experimental theater group under student directorship; Co-Kast, a student group which produces a recent Broadway musical show each fall; and Jesters, a student-written, student-directed, musical comedy presented in the spring.

**Social Service Organizations:** Through Alpha Phi Omega (national men's service fraternity), World University Service, the U. of R. Red Cross Chapter, Civil Rights and Civil Liberties Committee, as well as various religious organizations, students may volunteer service to area settlement houses, hospitals, tutorial programs, and fund-raising drives for charitable causes.

**Fraternities and Sororities:** Fourteen active social fraternities for men and four sororities for women are located on the River Campus. Twelve of the fraternities are nationally affiliated; the other two and all four sororities are local groups. The fraternities are Alpha Delta Phi (1851), Alpha Kappa Phi (1965), Delta Upsilon (1852), Delta Kappa Epsilon (1856), Psi Upsilon (1858), Alpha Epsilon Pi (1961), Theta Delta Chi (1920), Beta Gamma Sigma (1926), Sigma Chi (1932), Tau Kappa Epsilon (1954), Sigma Alpha Mu (1954), Chi Phi (1966), Theta Chi (1920), and Phi Epsilon Pi (1911). The sororities are Theta Eta (1903), Alpha Sigma (1903), Theta Tau Theta (1906), and Sigma Kappa Upsilon (1923). The Interfraternity and Intersorority Councils deal with the common interests of the respective groups.

**Honorary Societies:** Academic honorary societies include Phi Beta Kappa, Sigma Xi (Science), Tau Beta Pi (Engineering), Delta Phi Alpha (German) and Phi Sigma Iota (Romance Languages). In addition, there are the following local honorary leadership and service organizations: Marsiens for senior women, Keidaeans for senior men, Mendicants for junior men, Yellow Key for sophomore men and D'Lions for sophomore women.

**Academic and Special Interest Groups:** Departmental clubs give students opportunities to become acquainted with faculty and other students with similar academic interests.
Among nearly 100 organizations which provide a wide range of outlets for the individual student's personal interests are: Forensic Society, which sends debate teams to other area colleges and sponsors a tournament of its own each fall; an Arts Committee, with interest areas in Jazz, Classical, and Folk Music, Dance Drama and Art Exhibits; two student-run film programs—Cinema '62, which brings well-known art films to the campus and Campus Flicks, which provides light movie entertainment; Bridge Club, Outing Club, Photographie Society, International Students Union, several political groups, and an Association of Women Students.

Musical Activities

The program of musical activities on the River Campus is designed to contribute to the artistic and aesthetic development of the participating and listening student body. Active choral and instrumental organizations provide opportunities for those with musical interests and talents to develop these abilities under capable direction.

Men's Glee Club, founded in 1865, is one of the outstanding college men's choral groups in the country. The membership is selected by audition. The group performs several times a year on campus and often combines with women's singing groups from other colleges as well as with the U. of R. Women's Glee Club in order to perform major works with orchestra.

The Women's Glee Club, an outstanding women's choral group of about 100 voices, is selected by audition. The Club sings major works with men's choral groups on other college campuses.

The University Chapel Choir, composed of 50 members, presents special programs of sacred music primarily in Protestant Chapel services.

All-University Symphony Orchestra. The All-University Symphony Orchestra is composed of about 80 students, faculty, staff and alumni. The orchestra presents several concerts during the year with outstanding guest artists and in collaboration with glee clubs and chapel choir.

The Marching Band, open to both men and women, provides music and "half-time" spectacles for all home football games and for at least one out-of-town game.

The Symphonic Band begins rehearsals at the close of the Marching Band season and prepares musical presentations for University and civic functions.

The Pep Band is less formalized in its structure than the Marching Band or the Symphonic Band. It is run entirely by students to provide musical spirit at basketball games.

The Yellowjackets is a singing group of 16 upperclassmen selected from the Men's Glee Club.

The Baroque Ensemble is a small chamber orchestra specializing in baroque and early classical music.
RELIGION

The University of Rochester has no church affiliation, but it recognizes the importance of religion in campus life. A Chaplain and two Assistant Chaplains are appointed by the University to counsel and work with students and to coordinate the activities of all religious groups. They serve Protestant students on an inter-denominational basis, assisted by Chaplains or advisers to Protestant denominational groups. A full-time Roman Catholic Chaplain is provided by the Diocese. The B’nai B’rith Hillel Foundation provides a full-time Hillel Director who also serves as Chaplain to Jewish students. Offices for the Chaplains are on the second floor of Todd Union. Todd Union lounges and other facilities are available for group meetings.

Religious Organizations

Voluntary student religious interest finds expression through the activities of various campus organizations. A University Protestant Fellowship sponsors discussions, student study programs, social service, deputations, and worship, and affords opportunities for fellowship. There is a Lutheran Student Association, a Christian Science organization and an Inter-Varsity Christian Fellowship which meet regularly.

A Newman Program offers Catholic students regular lectures, study groups, annual retreats, daily Mass and social fellowship. The Newman Center, 561 Mt. Hope Avenue, provides a center for off-campus activities as well as a residence for the Catholic Chaplain.

The B’nai B’rith Hillel Foundation serves to transmit the Jewish heritage to the Jewish student through educational, religious, cultural, social and counseling services.

All campus religious groups are represented on an inter-religious council which coordinates programs and sponsors joint activities, such as study groups, coffee hours and the Campus Conference on Religion. The Council takes an active interest in campus life, social service and international affairs.

Worship

University Protestant Chapel services are held each Sunday at 11 a.m. in Strong Auditorium. The University Chaplain conducts all services except one each month when a distinguished clergyman, recognized for national leadership, is invited to the campus. The University Chapel Choir sings at these services.

Mass is celebrated each Sunday at 9 and 11 a.m. and at 4 p.m. in the West Lounge of Todd Union, Monday through Friday, at 4:30 and Saturday at noon in Upper Todd.

Jewish services are held on Friday at 7:15 p.m. in Upper Todd and are followed by a discussion or Oneg Shabbat.
ATHLETICS

The University of Rochester participates in intercollegiate competition in baseball, basketball, football, golf, soccer, tennis, swimming, track, wrestling, squash and sailing. Intramural sports also are a vital part of the athletic program.

The objectives of the University's athletic program are:

1. To give as many men as possible experience in intercollegiate sports.

2. To devote as much time to athletics as is necessary to give the participants all the worthwhile values that are derived from competition.

3. Opposing teams generally represent institutions of the same size with similar educational standards and athletic ideals.

4. To see that members of all varsity teams meet the same entrance requirements and scholarship standards as those required of the student body in general and that they successfully carry full-time academic work programs.

Women's sports, sponsored by the Women's Recreation Association, include intramural tennis tournament, swimming marathon, trampoline, gymnastics, and recreational swimming. WRA sponsors competition with other schools in basketball, swimming, volleyball, hockey and tennis. Contests in badminton, archery, and bowling may be set up according to demand. Doll Fins is the coed Synchronized Swimming Club which presents an annual show.
GENERAL REGULATIONS

General Responsibility

Students are expected to abide by the rules of the University and its faculties and conduct themselves in accordance with accepted standards of good citizenship, honesty and propriety, and with proper regard for the rights of others. When the University delegates judicial and disciplinary responsibilities to student groups, students must abide by their decisions.

Marriage: If a student plans to be married during an academic year, the Office of the Dean of Student Life should be notified at least two weeks in advance. Parents or guardians should also notify the Office of the Dean of Student Life that they are aware of the proposed marriage. A resident student who marries during the academic year may not continue to live in the Residence Halls.

Firearms: Possession of firearms on Campus is discouraged. Regulations governing their possession may be obtained from the Office of the Dean of Student Life. Immediate registration is required.

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

Soliciting Funds: Student groups engaged in any type of fund-raising activity must restrict their efforts to the River Campus. Exceptions to this rule must be approved by the Dean of Student Life.

Student Cars: Freshman and sophomore resident students are not permitted to bring cars to the University.

Drugs: Possessing certain drugs or providing them to others is against the law. The University will not tolerate these or any other illegal activities by its students or on its campus. Normally, punishment for students found guilty of possession, distribution, or use of drugs will be separation from the College, and the names of students violating drug laws will be made available to the law enforcement authorities.
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