Fall Semester

Friday, August 22

Tuesday and Wednesday, August 26 and 27
Thursday, August 28

Monday, September 8
Friday, September 19

Friday–Sunday, September 26–28
Saturday, October 11
Wednesday, October 15
Saturday, October 25
Monday–Friday, October 27–November 7
Wednesday, November 26
Monday, December 1
Saturday, December 6
Monday–Wednesday, December 8–10
Thursday, December 11
Saturday, December 20

Winter Session

Variable periods between Friday, December 26, and Wednesday, January 21

Spring Semester

Monday, January 19
Tuesday, January 20
Thursday and Friday, January 22 and 23
Monday, January 26

Monday, February 9
Friday, February 13
Saturday, March 21
Monday, March 30
Monday–Friday, April 6–17
Saturday, May 9
Sunday–Wednesday, May 10–13
Thursday, May 14
Saturday, May 23

Sunday–Saturday, May 24–30
Sunday, May 31

Summer Session 1987

Three-Week Session
Eight-Week Session
Six-Week Session

The dates shown in this calendar are subject to change at any time by official action of Cornell University.

In this calendar, the University has scheduled classes on religious holidays. It is the intent of the University that students missing classes due to the observance of religious holidays be given ample opportunity to make up work.

The Law School and College of Veterinary Medicine calendars differ in a number of ways from the University calendar. Please consult the Announcements of those colleges for details.

The courses and curricula described in this Announcement, and the teaching personnel listed herein, are subject to change at any time by official action of Cornell University.

The rules and regulations stated in this Announcement are for information only and in no way constitute a contract between the student and Cornell University. The University reserves the right to change any regulation or requirement at any time.
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The University

Cornell University is a community set among the lakes and hills of central New York and lying within the boundaries of the city of Ithaca, New York. Two men were the University’s creators: Ezra Cornell and Andrew Dickson White. Cornell had begun his career as a carpenter wandering in search of work. White, the younger, was well educated, a member of America’s cultural aristocracy. Cornell came to Ithaca in 1828, worked hard, sometimes failed, more often succeeded, and succeeded to the extent that in the middle 1850s he went out into the American business world. There he met Morse, inventor of the telegraph, became his partner, and was himself soon a wealthy man.

This success led him to the New York State Senate. White, a fellow senator, joined Cornell in discussing their common interest in higher education. They studied the Morrill Act of 1862, which gave land grants to the states as a means of financing state universities, and they saw here the opportunity to launch their own plan for a university. Cornell pledged half a million dollars as more financial support, and a large part of his farm in Ithaca as a university campus. Cornell University was born. The first building, Morrill Hall, opened its doors in 1868.

From the beginning the University had two obligations. First, to offer students the opportunity to earn a living as they studied. The land-grant money made that necessary. In doing this, Cornell University acted as a public institution. And, as a private institution, it served all comers who could qualify for admission.

What should it teach? White, trained in the classical tradition of the older colleges and universities, wished to teach philosophy, literature, government, history, and the sciences in a contemporary setting, shall we say, in terms of their usefulness to persons going out into the professions and business. Cornell put his wishes in a phrase that has become the University’s motto: “I would found an institution where any person can find instruction in any subject.”

White was the University’s first president. He had assembled a faculty of distinguished scholars from the United States, Canada, and Great Britain, many of whom, including a prominent Oxford professor, came to Cornell because they regarded the University’s approach to education as pioneering, lively, and suited to the needs of the time. What more appropriate than that, in this spirit of pioneering, Cornell should admit its first woman students in 1870.

In the last quarter of the nineteenth century the University grew rapidly and began to assume the shape it has today. As it rose to take its place among the so-called Ivy League universities, Cornell had a unique structure, part private and part public, part supported by private funds, part by grants from New York State. On the one hand were the endowed colleges: Arts and Sciences, Engineering, Law, and Architecture; on the other were state-supported, or statutory, colleges: Veterinary, Agriculture, and Home Economics.

The University drew strength from its two groups of colleges. A single administration, a single president, a single board of trustees, governed all the affairs of all; a single body, the University Faculty, directed educational policy. The needs of the endowed colleges called for the services of physicists, chemists, mathematicians, economists, historians, philosophers, biologists, lawyers. The needs of the statutory colleges called for many persons who had similar training but whose study of mankind and other animals and of plants followed a different path from that of the scholars in the endowed colleges. But this was for the good. The two groups of scholars had common ground for discussion. Out of diversity they could build unity.

By the early twentieth century, Cornell was well on the way to greatness. President White had served as America’s ambassador to Russia and to Germany.

Schuman, a later president, was to be ambassador to Germany and to China. To the University’s faculty came scholars from many countries, as teachers and as students. To join Cornell’s undergraduates and graduate students came men and women from all over the world. So that the University became what it is today, one of the most cosmopolitan in the United States.

The student population grew from the five to six thousand of the early twentieth century to its present figure of about seventeen thousand; the faculty from about two hundred to the present fifteen hundred. More persons to study, to carry on research, and to teach meant more classrooms and laboratories, more libraries and dormitories, more places for worship and social centers, more playing fields and swimming pools. Buildings and places for outdoor recreation grew up on Ezra Cornell’s farm, with a massive art gallery on the very spot where he once stood to admire Cayuga Lake and the city of Ithaca.

This growth of faculty, students, and the facilities they needed led to great specialization in the University’s schools and colleges. Engineering College divided into many parts, such as mechanical, electrical, and chemical, and among the biological sciences there were similar divisions. Among the endowed colleges a School of Hotel Administration appeared, and a Graduate School of Business that became the Samuel Curtis Johnson Graduate School of Management. The Veterinary College became the College of Veterinary Medicine. And there was a new school, the School of Industrial and Labor Relations.

Cornell University has come to be a place of learning where its scholars and students have reached out into every aspect of human affairs, into all forms of study relating to our planet, and to the limits of the universe as man knows them. Behind this achievement lies more than a century of steady, solid growth, the enterprise of hundreds of thousands of students, the dedication of thousands of professors, the skill of administrators, the wisdom of trustees.

The vast range of knowledge and experience assembled at Cornell gives to students and professor a sense of security. The security comes from being heir to a century of steady, solid growth, the enterprise of hundreds of thousands of students, the dedication of thousands of professors, the skill of administrators, the wisdom of trustees.

The Students

Cornell University has a student body of about 18,000, which includes seven undergraduate divisions of about 13,000 students and four graduate divisions of about 5,000 students in Ithaca. The student body is diverse in its religious and background origins, with 43 percent of the undergraduates from New York State, 42 percent from the remaining fifty states, and 9 percent from approximately one hundred foreign countries.

Regional Origin of Students

<table>
<thead>
<tr>
<th>Region</th>
<th>Number of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>New England</td>
<td>1,777</td>
</tr>
<tr>
<td>New York State</td>
<td>8,743</td>
</tr>
<tr>
<td>Mid-Atlantic</td>
<td>2,711</td>
</tr>
<tr>
<td>Southeast</td>
<td>546</td>
</tr>
<tr>
<td>Midwest</td>
<td>1,229</td>
</tr>
<tr>
<td>Southwest/Mountain</td>
<td>353</td>
</tr>
<tr>
<td>Far West</td>
<td>844</td>
</tr>
<tr>
<td>Foreign and United States possessions</td>
<td>1,559</td>
</tr>
<tr>
<td>Total</td>
<td>17,762*</td>
</tr>
</tbody>
</table>

*Figures are for fall 1985 and do not include extramural students, students registered in absence, or students in the New York City divisions.

It is the policy of Cornell University actively to support equality of educational and employment opportunity. No person shall be denied admission to any educational program or activity or be denied employment on the basis of any legally prohibited discrimination involving, but not limited to, such factors as race, color, creed, religion, national or ethnic origin, sex, age, or handicap. The University is committed to the maintenance of affirmative action programs which will assure the continuation of such equality of opportunity.

Cornell University is committed to assisting those handicapped students who have special needs. A brochure describing services for the handicapped student may be obtained by writing to the Office of Equal Opportunity, Cornell University, 234 Day Hall, Ithaca, New York 14853-2801. Other questions or requests for special assistance may also be directed to that office.

Retention and Graduation of Undergraduates

By fall 1985, 82 percent of the first-time freshmen who entered the endowed undergraduate units in fall 1979 (Architecture, Art, and Planning; Arts and Sciences; Engineering; and Hotel Administration) had graduated. In the statutory units (Agriculture and Life Sciences, Human Ecology, and Industrial and Labor Relations), 85 percent of the first-time freshmen who entered in fall 1979 had graduated.
University Resources

Students benefit from a wide variety of resources, both human and physical, that contribute significantly to their Cornell education. The following sections provide an idea of some of the more intriguing and stimulating possibilities.

University Libraries

Cornell University Libraries is one of the major academic library systems in the United States. Its sixteen campus libraries contain over five million volumes and subscribe to fifty-two thousand periodicals. The libraries provide the facilities for research and study in hundreds of undergraduate major subject areas and in over eighty-five fields of study for advanced degrees.

All students at Cornell are entitled to use any of the libraries on campus, although access to the stacks may be limited in some cases. Students are particularly encouraged to participate in the orientation sessions and tours offered at the beginning of each semester by the larger campus libraries. Schedules and tour information are available at every library.

At the south end of the Arts Quadrangle is Uris Library, the building with the tower that has become the symbol of Cornell. Uris is essentially a library for undergraduates in the liberal arts. A principal aim of this library is to bring readers and books as close together as possible. Accordingly, the stacks, containing more than 142,000 volumes, are open to all, and only reserve books in heavy demand are held in a special category. There are listening rooms where students can hear recordings of the spoken word, and there is a lecture room with sound and projection capabilities.

Across the walk from Uris is the John M. Olin Library, devoted more specifically to graduate and faculty research. This closed-stack library houses many special collections of books and manuscripts, among them rare books, collections on East and Southeast Asia, the Icelandic Collection, the History of Science Collections, the archives of the University, maps, microfilms, and newspapers.

The two libraries, Uris and Olin, complement each other in support of the University's program of teaching and scholarship. In addition to these facilities, there is an extensive system of college and school libraries. Chief among them is the Albert R. Mann Library, serving the New York State Colleges of Agriculture and Life Sciences, and Human Ecology. Located at the east end of the Agriculture Quadrangle, Mann Library's open stacks hold a million volumes and include the research library of the Division of Biological Sciences.

Other college libraries are the Fine Arts Library, serving the College of Architecture, Art, and Planning; the libraries of the College of Engineering and the New York State College of Veterinary Medicine; and the libraries that serve the Johnson Graduate School of Management, the Law School, the School of Hotel and Industrial Labor, and the New York State School of Industrial and Labor Relations. In addition, there are many large department libraries on the campus. For more specific information, see Libraries at Cornell, available at all libraries.

Many of the libraries have special copying services, audiovisual facilities, bibliographic retrieval services, study rooms, microfilm and microfiche readers, typewriters, and interlibrary loan services, and some publish handbooks and bibliographies that are distributed without charge. Available in all the libraries are directories of subject locations, hours, and services.

Museums and Art Exhibitions

The Herbert F. Johnson Museum of Art is recognized as one of the country's leading university art museums. Designed by world-renowned architect I. M. Pei, the building's upper-level galleries provide sweeping views of Cornell, Ithaca, Cayuga Lake, and the surrounding countryside.

The collections include paintings, drawings, sculpture, photographs, prints, textiles, and crafts spanning thirty centuries and six continents. They are particularly strong in Asian, nineteenth-century American, graphic, and contemporary art. In addition, the museum presents approximately fifteen special exhibitions each year as well as demonstrations, film screenings, workshops, music and dance performances, and other programs.

Student membership in the museum is $10. Members receive a subscription to the bimonthly newsletter, invitations to opening receptions and special programs, discounts on catalogues and posters, and other benefits.

Located on the corner of Central and University Avenues, the museum is open Tuesday through Sunday from 10:00 a.m. to 5:00 p.m. Admission is free. For further information call 255-6464.

Art exhibitions. Cornell is generously supplied with art exhibitions, some permanent and some temporary. The displays range from the works of students and visitors collections to the permanent University collection housed at the Herbert F. Johnson Museum of Art. Other campus locations for art displays include the Art Room in William Straight Hall, the John Hartell Gallery in Sibley Hall, and the galleries in Goldwin Smith Hall, Martha Van Rensselaer Hall, and Olive Tjaden Hall.

Music

Students who want to participate in music making will find a wide range of opportunity through the Sage Chapel Choir, the Cornell Chorus, the University Glee Club, the University orchestras and bands, chamber music ensembles, the Opera Workshop, the Collegium Musicum, and the Indonesian Gamelan. The Cornell chimes, housed in McGraw Tower, are rung by students.

The University Faculty Committee on Music sponsors programs by visiting soloists and major orchestras in the Bailey Hall Concert Series, string quartets and other chamber music ensembles in the Statler Series at the Alice Statler Auditorium, and occasional opera, ballets, and special events. The Department of Music presents nearly a hundred concerts, recitals, and other events each academic year, all free of charge. These include performances by members of the faculty, students, visiting artists, and department ensembles, as well as lectures by visiting musicians and scholars. Many take place in the Barnes Hall auditorium, and they include a wide variety of music from both Western and non-Western traditions.

The Cornell Concert Commission offers a series of student-produced popular concerts. Other student organizations have regular performances of Gilbert and Sullivan operettas, jazz, and folk music.

Astronomy

Cornell has a vigorous Department of Astronomy oriented towards research in modern astrophysical topics. Cornell operates two local optical observatories, the Fuertes Observatory (near the North Campus area) and the Hartung Boothroyd Observatory, and the world's largest radio-radar telescope, in Arecibo, Puerto Rico.

The Spacecraft Planetary Imaging Facility, a joint undertaking of NASA's Planetary Geology Program and the University, serves as a focus for planetary studies at Cornell. The facility contains a comprehensive collection of tens of thousands of images obtained by United States planetary and lunar spacecraft, as well as related cartographic and support data. Cornell astronomers have also played a major role in research in infrared astronomy from space, including the highly successful Infrared Astronomical Satellite, and are currently involved in NASA's Space Infrared Telescope. The department operates several computers, including two VAX 11/750's with high resolution color graphics.

Study and research is focused on several broad areas, including theoretical astrophysics, infrared astronomy, planetary sciences, and radio-radar astronomy.

Theater

Cornell students have numerous opportunities to attend or participate in theatrical productions.

Theatre Cornell presents a full season of classical, modern, experimental, and musical dramas. All students in the University are encouraged to become involved in these productions as actors, crew members, stage managers, or assistant directors. Projects frequently include guest professionals as well as graduate actors from the professional actor training program of the Department of Theatre Arts. Interested students should call Theatre Cornell for production details and audition dates. Many exciting theater projects are also carried out each semester by the undergraduate theater organization, the Cornell Dramatic Club.

Other theatrical opportunities can be found at Risley Residential College, which has a small theater available for student productions; with the Cornell Savoyards, who produce two Gilbert and Sullivan operettas annually; and within the Ithaca community, which has several theater groups that mount various productions during the year.

Dance

The dance program, cosponsored by the Departments of Theatre Arts and Physical Education and Athletics, offers a range of possibilities for students interested in dance. Work by faculty, student, and guest choreographers is presented during the year by means of informal studio presentations as well as fully produced performances. The dance program also sponsors a series of performances by professional touring companies. The Ithaca community includes several studios that present workshops and performances in a wide range of dance forms.

Students interested in social and ethnic dance will find that dancing is a popular activity. Student organizations sponsor folk, contra, and square dances frequently. Most dances are taught at these events, and beginners are welcome.

Lectures

On the more academic side of audience entertainment, there is the lecture. Dozens of extracurricular lectures are given every week, ranging from scholarly presentations on a wide range of topics to lectures by well-known speakers with campuswide appeal.
Films
Throughout the year and on almost every night of the week, single film showings and film series make available educational and entertaining films at reduced rates. In addition, there are a half-dozen commercial theaters in Ithaca itself, making movie-going among the most popular leisure-time activities.

Students interested in producing their own films may participate in the filmmaking program sponsored by the Department of Theatre Arts.

Publications
Cornell students edit and publish a wide variety of publications, including a yearbook, literary magazines, and a number of magazines relating to special fields of interest. The Cornell Biographical and Class Magazine, 60 Times, and the Cornellian are edited by students.

Special Facilities for Research
There are two Cornell medical facilities in New York City: the Graduate School of Medical Science, and the Cornell Medical College. Both sponsor a great variety of research. Other facilities at Cornell, mostly located in Ithaca, offer faculty members and students a range of opportunities. There are seven national research centers at Cornell (the Center for Theory and Simulation in Science and Engineering, the Laboratory of Nuclear Studies, the Cornell High-Energy Synchrotron Source, the National Astronomy and Ionosphere Center, the Materials Science Center, the National Research and Resource Facility for Submicron Structures, and the Mathematical Sciences Institute), which are open to researchers from around the country; these are unique national resources that are primarily oriented toward research by the Cornell faculty. Some of these and other Cornell research centers are described below.

Agricultural and Biological Sciences
Bradfield Hall houses computers, radar, and other specialized equipment used in making up-to-the-minute weather forecasts. The insect collection, newly housed in Academic II, contains more than four million specimens, making it one of the largest university insect collections anywhere. Liberty Hyde Bailey Hortorium is the country’s leading center for the study of palms, a plant family second only to grasses in economic importance. The Department of Food Science operates a full-scale dairy plant and a salesroom.

Cornell University is the New York State Center for Advanced Technology in Biotechnology in agriculture and operates the Biotechnology Institute, which supports basic research in cell biology and molecular genetics with application to plants, animals, and cell production.

The Conron and Mudd buildings, a complex for biological sciences, house many different controlled environments: cold rooms; chambers controllable for constant light, humidity, and temperature; aviaries; aquarium rooms; rooms for electron microscopy; and anechoic chambers, among other facilities.

The new Academic II building provides modern facilities for the Department of Entomology, teaching in the biological sciences, and Media Services.

The Departments of Plant Breeding, Plant Pathology, Floriculture and Ornamental Horticulture, and Vegetable Crops are housed in the Plant Science Building, Gutenman Laboratories, and Bradfield Hall; the Boyce Thompson Institute for Plant Research, which is housed in facilities on Tower Road; and the Agricultural Experiment Station at Geneva give the University the largest concentration of plant scientists in the world.

The New York State Agricultural Experiment Station at Geneva is renowned for research on fruits and vegetables. The seven-hundred-acre campus, located fifty miles from Ithaca, has excellent facilities for carrying out research in horticulture, entomology, plant pathology, and food science. Many graduate students conduct their research at the experiment station under the guidance of the sixty-six resident faculty members.

Near the campus are a 180-acre, University-affiliated bird sanctuary, Sapsucker Woods; and the Cornell Plantations, which have trails through natural areas and special collections, including peonies, rhododendrons, nut trees, an herb garden, a wildflower garden, and seasonal plantings.

The Animal Science Teaching and Research Center was established in 1973 on twenty-five hundred acres of fertile valley and hillside land near Dryden, about fifteen miles from campus. It now houses some 760 head of dairy cattle, 300 beef cattle, and 400 sheep. About one thousand acres of corn and grasses are planted and harvested each year.

A new Large Animal Research and Teaching Unit on campus greatly expands the research on, and teaching of, metabolic control of growth and lactation in large animals.

The orchard laboratory conducts research on fruit crops; the popular salesroom may be reached by campus bus.

Other renowned off-campus facilities include Shoals Marine Laboratory, a marine biology laboratory six miles off the Maine and New Hampshire coasts.

Engineering and Physical Sciences
The National Research and Resource Facility for Submicron Structures is one of the newest research facilities on campus. It is expected to have a profound effect on submicron microelectronics and other interdisciplinary research that requires microminiaturization. The Laboratory of Atomic Studies operates a synchrotron radiation laboratory in conjunction with a high-energy storage ring. The Laboratory for Plasma Studies provides a center for research in plasma physics and lasers. The Materials Science Center provides a number of facilities with modern sophisticated instrumentation in campuswide support of research in materials science. These facilities offer valuable opportunities to those undergraduates participating in the research programs of any department. The Ward Laboratory for Nuclear Engineering is the site of interdisciplinary research involving irradiation, isotope production, activation analysis, and neutron radiography.

Resources for geological and seismological research are provided by the Department of Geological Sciences and the Institute for the Study of the Continents.

The Program of Computer Graphics is an interdisciplinary research center concentrating on the input and display methods for computer graphics and computer-aided design. A separate facility for undergraduates is operated by the Department of Computer Engineering, called the Computer-Aided Design Instructional Facility, is available for teaching.

The world’s largest radio-radar telescope, in the Arecibo Observatory in Puerto Rico, is operated by Cornell University through the National Astronomy and Ionosphere Center in Ithaca.

Social Sciences
Uris Hall (Department of Psychology) houses the human experimental laboratory, laboratories in biopsychology and social psychology, and the Eleanor J. Gibbon Laboratory of Developmental Psychology, which explores the development of perception in infants. Laboratories and observational facilities in Martha Van Rensselaer Hall (Department of Human Development and Family Studies) facilitate research in infant and child development, both normal and abnormal. A laboratory nursery school provides opportunities for research involving preschool children and early childhood education.

The Cornell Institute for Social and Economic Research (CISER) supports the research activities undertaken by its own programs and by the over two hundred individual researchers affiliated with the institute. Many institute resources and services are also available to all Cornell researchers and students with social science interests. Some special technical services are available for a fee.

CISER services include the CISER data archive, which provides central access and management for social science data to researchers; two computing facilities for social science research developed and maintained in cooperation with Cornell Computer Services, which are located in Martha Van Rensselaer and Uris Halls; a microcomputer statistical development facility located in Warren Hall; and a survey research facility that provides operational support for faculty members, students, and administrators.

Computer Services
At Cornell, computers are used by musicologists, archaeologists, historians, engineers, architects, writers, linguists, accountants, doctors, scientists, students, and faculty members in every discipline. Cornell Computer Services (CCS) supplies and maintains computer hardware, operating systems, and general and specialized programs to meet a broad spectrum of user needs. To make these resources readily accessible, CCS operates public terminals and microcomputers, provides some free consulting services, produces informative documentation, and offers a variety of user education programs.

Cornell’s main computers consist of large-scale IBM computers with attached array processors, a DECSYSTEM 2065, two MicroVAX IIs, and two VAX 11/750s. Public terminal clusters are located in sixteen different areas on campus, and they house approximately three hundred workstations, including more than 175 microcomputers. Recent additions to expanding computer facilities on campus are a Macintosh word processing facility in Goldwin Smith Hall and a CRT facility in Pleasant Grove family housing. The number of public microcomputers will continue to increase. Computer graphics equipment in Uris Hall and a laser printer in Warren Hall are available for public use.

Cornell is one of four institutions in the country to house a national advanced scientific computing center (supercomputer) and the first to become fully operational. Initial configuration included an IBM 3084X Q mainframe computer and four FPS-264 array processors. The next-generation machine will replace the IBM 3084XQ when it becomes available.

Cornell is attached to TELENET and YAMENET, which allow the central Cornell computers to be accessed by a local phone call from all fifty states, Mexico, Canada, and Europe. As a member-supplier of EDUNET, Cornell shares high-performance resources with other universities, colleges, and nonprofit groups associated with higher education and research. Cornell is also a member of BITNET and MAILNET, providing two-way "electronic mail" service between Cornell and other universities.
Degree Programs

Undergraduate Degrees

The undergraduate curricula at Cornell University lead to the Bachelor of Arts (A.B.) degree in the College of Arts and Sciences or the Bachelor of Science (B.S.) degree, offered by the College of Agriculture and Life Sciences, the College of Human Ecology, the School of Hotel Administration, the College of Engineering, and the School of Industrial and Labor Relations. The College of Architecture, Art, and Planning offers the Bachelor of Architecture (B.Arch), the Bachelor of Fine Arts (B.F.A.), and the Bachelor of Science (B.S.) degrees.

Graduate Degrees

The graduate program at Cornell, with its emphasis on flexibility and independence, permits an unusual degree of accommodation to the needs and interests of the individual student. Most graduate degrees are offered through the Graduate School. Professional graduate degrees are offered through the professional schools and colleges. More information on the graduate degrees offered by Cornell may be found in the section on the Johnson Graduate School of Management, the Graduate School, the Law School, and the New York State College of Veterinary Medicine.

Division of Unclassified Students

The Division of Unclassified Students (DUS) assists Cornell undergraduates in transferring between colleges of the University when direct internal transfer is not possible. The division also serves as a counseling agency for students whose academic and career goals have changed. Such students are advised about alternatives within the Cornell system.

To apply to the division, students must:
1) Make an appointment for an interview in DUS (telephone: 255-4386).
2) Complete the DUS application form and return it to the division office, 158 Olin Hall.
3) Submit Application for Transfer coupons to their college registrar, requesting transfer to DUS.

Candidates are admitted to the division when, in the judgment of the DUS Administrative Committee, there is reasonable evidence that a transfer can be accomplished and that the proposed program is consistent with the student's stated objectives.

Undergraduate Business Study

Undergraduate preparation for business is found in many schools and colleges at Cornell. Students most frequently take courses in more than one area, as well as in related fields, to construct a program to suit their interests and career objectives. Each of the following areas provides a different focus for application and use of business study and training, and students should consider carefully the implications of each program when making a choice. (Graduate study is available in the Johnson Graduate School of Management as well as in graduate fields following each of the undergraduate options.)

The areas most often pursued include applied economics and business management (College of Agriculture and Life Sciences), economics (College of Arts and Sciences), engineering, hotel administration, consumer economics and housing (College of Human Ecology), and industrial and labor relations.

Applied economics and business management.

Agricultural economics, business management and marketing, farm business management and finance, food-industry management, and resource economics are the areas available. There is more emphasis on the application of these areas than on the theoretical aspects of economic theory and money, currency, and banking. (These subjects would be more easily pursued in the Department of Economics.) Instruction is appropriate for both agricultural and nonagricultural pursuits.

Economics.

This program provides a broad view of that social science concerned with the description and analysis of the production, distribution, and consumption of goods and services, the understanding of monetary systems, and the comprehension of economic theories and models. It is viewed more often as preprofessional than as training for immediate practice in business or economics.

Engineering.

This area provides much of the management personnel of modern industry. Engineers frequently climb the ladders of technological management that lead to more general management responsibilities; more than half of the management-level personnel of major corporations such as General Electric, Xerox, IBM, and Du Pont have engineering degrees. In addition to becoming managers by being effective technical supervisors, many students enter engineering explicitly anticipating graduate business education, judging that an engineering background is particularly appropriate for management in a technology-oriented society.

Study in operations research and industrial engineering is particularly appropriate for those anticipating a business management career. The curriculum focuses on the design of integrated, cost-effective systems of people, materials, and equipment for manufacturing industries, public and private service organizations, and consulting firms.

Hotel administration.

The undergraduate program in hotel administration prepares individuals to be mid- to upper-level managers and entrepreneurs for the hospitality industry (lodging, food service, and travel) through instruction in administration and general management, human-resources management, accounting and financial management, food and beverage management, law, properties management, communication, science and technology, economics, and marketing.
Consumer economics and housing. The focus is on the economic behavior and welfare of consumers in the private, public, and mixed sectors of the economy. There is an option for special concentration on housing. Study aims at an understanding of economics, sociology, and government policy as they apply to consumer problems.

Industrial and labor relations. The world of work, especially the employee-employer relationship in the broadest sense, including the political, social, and economic forces affecting that relationship, is studied. Graduates can pursue immediate employment in industry, government, and labor organizations or choose graduate study in industrial and labor relations or such related fields as law, business, and public administration.

Related Areas
Courses in areas directly related to these business programs are found in many of the University departments. For example, quantitative methods may be studied in the Departments of Mathematics and Computer Science, and courses in public administration are found in the Departments of Government, and City and Regional Planning. There are additional interdisciplinary programs with an interest in business to focus on a particular geographic area. Examples are the Latin American Studies Program, the South Asia Program, and the Africana Studies and Research Center. Such interdisciplinary programs as the Program on Science, Technology, and Society and the various programs in international agriculture provide additional opportunities for study of interest to business students.

Combined Degree Programs
Because Cornell has the Samuel Curtis Johnson Graduate School of Management, special opportunities exist for highly qualified undergraduates to combine their undergraduate programs with graduate study in that school. Students in the double-registrant program generally receive a bachelor’s degree after four years of study and a Master of Business Administration degree after the fifth year of study, rather than the usual sixth year. Students in all Cornell undergraduate colleges and schools are eligible to explore this option. There is also a program with the College of Engineering that allows qualified students to earn a B.S., M.B.A., and Master of Engineering degree in six years. Admission to these combined degree programs is limited to particularly promising applicants. Careful planning is required for successful integration of the work in the two schools.

Prelaw Study
Law schools do not prescribe any particular prelaw program, nor do they require any specific undergraduate courses as do medical schools. Law touches nearly every phase of human activity, and there is practically no subject that cannot be considered of value to the lawyer. Therefore, no undergraduate course of study is totally inappropriate. However, law students should be guided by certain principles when selecting college courses.
1. Interest encourages scholarship, and students will derive the greatest benefit from those studies that stimulate their interest.
2. Of first importance to the lawyer is the ability to express thoughts clearly and cogently in both speech and writing. Courses in the Freshman Seminar Program, required of nearly all Cornell freshmen, are designed to develop these skills. English literature and composition, and communication arts courses also serve this purpose. Logic and mathematics develop exactness of thought. Also of value are economics, history, government, and sociology, because of their close relation to law and their influence on its development and ethics, and philosophy, because of the influence of philosophic reasoning on legal reasoning and jurisprudence. Psychology leads to an understanding of human behavior. Some knowledge of the principles of accounting and of the sciences such as chemistry, physics, biology, and engineering is recommended and will prove of practical value to the lawyer in general practice in the modern world.
3. Cultural subjects, though they may have no direct bearing on law or a legal career, will expand students’ interests; help cultivate a wider appreciation of literature, art, and music; and make better-educated and well-rounded persons.
4. Certain subjects are especially useful in specialized legal careers. For example, in agriculture, chemistry, physics, or engineering—when coupled with training in law, may furnish qualifications necessary for specialized work with the government, for counseling certain types of businesses, or for a career as a patent lawyer. A business background may be helpful for those planning to specialize in corporate or tax practice. Students who anticipate practice involving labor law and legislation might consider undergraduate study in the School of Industrial and Labor Relations. Whatever course of study is chosen, the important tasks are to acquire perspective, social awareness, and a critical cast of mind; to develop the ability to think logically and analytically; and to express thoughts clearly and forcefully. These are the crucial tools for a sound legal education and successful career.

The presence of the Cornell Law School on campus provides the opportunity for a limited number of highly qualified undergraduates registered in the College of Arts and Sciences at the University to be admitted to the Law School. At the time of entry they must have completed 105 of the 120 credits required for the Bachelor of Arts degree, including 92 credits of course work in the College of Arts and Sciences.

It may be possible for exceptionally well qualified students in other Cornell undergraduate colleges to arrange to enter the Law School after three years. The College of Human Ecology offers a program in which students spend their fourth year at the Law School. In addition, members of the Cornell Law School faculty often offer undergraduate courses such as Nature, Functions, and Limits of Law, which are open to all undergraduates.

Premedical Study
Medical and dental schools, while not requiring or recommending any particular major course of study, do require that a particular selection of undergraduate courses be completed. These courses usually include general chemistry and organic chemistry, biology, physics, and a year of English composition (or a Freshman Seminar course). In addition, many medical schools require or recommend at least one advanced biological science course, such as genetics, embryology, histology, or physiology.

There is no major program that is the best for those considering medical or dental school, and students are therefore encouraged to pursue their own intellectual interests. Students are more likely to succeed at, and benefit from, subjects that interest and stimulate them, and there is no evidence that medical colleges give special consideration to any particular undergraduate training beyond completion of the required courses. In the past, successful Cornell applicants to medical and dental schools have come from the Colleges of Arts and Sciences, Agriculture and Life Sciences, and the College of Engineering, and Engineering. The appropriate choice depends to a great extent on the student’s other interests.

Qualified students in the Colleges of Agriculture and Life Sciences, Arts and Sciences, and Human Ecology may apply for acceptance into a double-registration program arranged between Cornell University and Cornell University Medical College in New York City. This program allows registered students to save one year in pursuit of the bachelor's and M.D. degrees.

Further information about this program is available from the Health Careers Program office at the Career Center, Cornell University, 203 Barnes Hall, Ithaca, New York 14853-1601.

Preveterinary Study
There is no specific preveterinary program at Cornell, and students interested in veterinary medicine as a career should select an area for study that fits their interests while at the same time meeting the entrance requirements for veterinary college listed below. Most preveterinary students at Cornell are enrolled in the College of Agriculture and Life Sciences, which offers several applied science majors, including animal science, that can lead to related careers if the student is not accepted into veterinary college. Some enter other divisions of the University, especially the College of Arts and Sciences, because of secondary interests or the desire for a broad liberal arts curriculum.

The college-level prerequisite courses for admission to the New York State College of Veterinary Medicine at Cornell are English, biology or zoology, physics, inorganic chemistry, organic chemistry, biochemistry, and microbiology. All science courses must include a laboratory. The college also requires demonstrated proficiency in written and spoken English and encourages college-level work in mathematics. These requirements, necessary for admission to the New York State College of Veterinary Medicine at Cornell, may vary slightly at other veterinary colleges.

For information on additional preparation, including work experience and necessary examinations, students should consult the brochure Admission to the New York State College of Veterinary Medicine, obtained by writing to the Office of Admissions, College of Veterinary Medicine, Cornell University, C17 Schurman Hall, Ithaca, New York 14853-6401.

Business and Preprofessional Study
Africana Studies and Research Center

For information about the programs and courses offered by the center, see the section "Special Programs and Interdisciplinary Studies" in the course listings for the College of Arts and Sciences.

Faculty Roster

Cross, William E., Ph.D., Princeton U. Assoc. Prof., Africana Studies and Research Center
Edmondson, Locksley G., Ph.D., Queens U. (Canada), Visiting Prof., Africana Studies and Research Center
Graves, Anne Adams, Ph.D., U. of Michigan, Ann Arbor. Asst. Prof., Africana Studies and Research Center
Harris, Robert L., Ph.D., Northwestern U. Assoc. Prof., Africana Studies and Research Center

Adjunct Faculty

Ben-Jochannan, Yosef, Ph.D., Cambridge University, Africana Studies and Research Center
Nanj, Abdul, M.A., S.U.N.Y., Africana Studies and Research Center

Andrew D. White Professors-at-Large

The program has its origins in Cornell's early history. Andrew D. White, the first president of Cornell University, inaugurated the position of nonresident professor, to be held by eminent visiting scholars who would periodically visit the University in order to supplement the activities of the permanent University faculty. Professors-at-Large, who serve for a six-year term, are full members of the faculty when in residence.

Term Ending in 1986

Arigoni, Giulio, organic chemist. Eidgenössische Technische Hochschule, Zurich
Le Roy Ladurie, E., historian. College de France, Ecole des Hautes Etudes en Sciences Sociales

Term Ending in 1987

Antonioni, Michelangelo, film director
Greengard, Paul, neuropathologist. Rockefeller University
Lovász, László, mathematician. Eötvös Loránd University, Budapest Rich, Adrienne, poet

Term Ending in 1988

Baxandall, Michael, art historian. The Warburg Institute Boriauq; Norman E., plant scientist. International Maize and Wheat Improvement Center, Mexico
Derrida, Jacques, philosopher and literary critic. Ecole des Hautes Etudes en Sciences Sociales, Paris
Garwin, Richard L., physicist. IBM Thomas J. Watson Research Center
Shaw, Margery W., geneticist, physician, lawyer. University of Texas Health Science Center, Houston

Term Ending in 1989

Cox, David R., statistician. Imperial College of Science and Technology, London

Dover, Sir Kenneth, classicist. President, Corpus Christi College, Oxford
Szarowski, John, curator and historian of photography. The Museum of Modern Art, New York
Woolhouse, Harold W., biologist. John Inns Institute, Norwich, and University of East Anglia

Term Ending in 1990

Heilbron, John L., historian of science. University of California at Berkeley
Lewis, Bernard, Islamicist. Princeton University Wely, Eudora, novelist and short story writer

Common Learning Courses

The objective of Common Learning courses is to enable students to acquire new knowledge about problems of significance to contemporary society and to examine these problems from a variety of intellectual perspectives. This dual objective implies challenging students to learn to define problems, gather relevant evidence, organize and interrelate materials, and present findings and conclusions both orally and in writing. The findings should include a systematic evaluation of alternative solutions, including assessment of their social and ethical implications. At every stage of the inquiry, course activities are expected to adhere to the canons of evidence and reason.

Common Learning courses are open only to juniors and seniors but will include students from a diversity of majors and a range of schools and colleges. Class size normally does not exceed twenty students. The limitation on class size and the diversity of students should encourage undergraduates with different training and interests to exchange knowledge with each other as well as with the professor responsible for the course. Courses are designed and taught by a single member of the faculty, although consultation with, and course participation by, colleagues in other disciplines is expected and encouraged. Titles of courses given to date are listed below. Some of these will be offered again in 1986–87 along with other new courses. For titles and descriptions of courses to be given in 1986–87 consult the office of the vice provost for distribution, and other academic requirements. A limited number of apartments may be rented at the Cornell Center, 2148 O St., NW, Washington, D.C. 20037. All are fully furnished (except for dishes, linens, and bedding) and reasonably priced by Washington standards.

Further information concerning externships, courses, and other features of the program may be obtained from the Cornell-in-Washington office at 134 McGraw Hall (telephone: 255-4060) or by contacting the Cornell Center in Washington, 2148 O Street, N.W., Washington, DC 20037 (telephone: 202/466-2184).
Students majoring in the humanities are strongly urged either to deepen their knowledge of science by taking a second course in the science they took to fulfill the science requirement, or to broaden their knowledge by taking a second introductory course in another science.

**Graduate Studies**

Graduate students in the field are encouraged to work closely with scientists, engineers, and humanists. Although the Field of the History and Philosophy of Science and Technology has no specific course requirements, each student working toward the Ph.D. degree will be expected to show proficiency equivalent to

1. four graduate-level semester-long courses in the branch of science or engineering of prime importance to subsequent thesis work,
2. four semester-long courses in history, and
3. four semester-long courses in philosophy.

History and philosophy courses in various specialties are frequently offered by other departments in addition to those of history and philosophy.

**Center for International Studies**

The Center for International Studies, 170 Uris Hall, is a University unit dedicated to the support and development of Cornell's international and comparative programs. Serving as an administrative base and clearinghouse for programs, information, and new initiatives in international studies, the center is particularly committed to the development of multidisciplinary, intercollege educational and research activities.

The center sponsors and coordinates international area studies and topical programs as well as international undergraduate educational programs such as Cornell Abroad and Cornell International Internships.

The center also sponsors the Field of International Development, a program leading to a professional master's degree, and an undergraduate concentration in international relations.

**CIS Area Programs and Topical Programs**

- China-Japan Program (140 Uris Hall)
- Latin American Studies Program (190 Uris Hall)
- South Asia Program (170 Uris Hall)
- Southeast Asia Program (120 Uris Hall)
- Committee on Soviet Studies (180 Uris Hall)
- Western Societies Program (117 Stimson Hall)
- Comparative Economic Development (468 Uris Hall)
- Comparative Studies in Professionalism and Professional Education (170 Uris Hall)
- International Ethnicity (170 Uris Hall)
- International Agriculture Program (261 Roberts Hall)
- International Legal Studies (309 Myron Taylor Hall)
- Program in International Nutrition (127 Savage Hall)
- International Political Economy (170 Uris Hall)
- International Population Program (372 Uris Hall)
- Peace Studies Program (180 Uris Hall)
- Rural Development Committee (170 Uris Hall)
- International Studies in Planning (200 West Sibley Hall)

Current programs coordinated by the Center for International Studies include the following:

- **Cornell Abroad (130 Uris Hall)**, Arch Dotson, associate director; Ann Roscoe, executive staff assistant.

One major function of the center is the University-wide coordination of international academic experiences for undergraduate students. Cornell Abroad (Cornell-sponsored study abroad program) began operation in 1965 and now has program sites in England, Scotland, Germany, Spain, France, Denmark, Israel, and Egypt.

**International Internships Program (130C Uris Hall)**, Dwight Giles, director.

An international internships program for undergraduate and graduate students that gives students preprofessional experience in international settings. Admission is by application only and requires proficiency in a foreign language. Internship sites are in Venezuela, Mexico, West Germany, Spain, and Sweden. Additional sites are also being developed. The program is open to students in all fields of study.

**Master of Professional Studies in International Development (170 Uris Hall)**, Norman Uphoff, graduate field representative.

A program intended for midcareer practitioners is sponsored by the center leading to a Master of Professional Studies in International Development. Interested individuals should apply through the Graduate School.

**International Relations Concentration (160 Uris Hall)**, Peter Katzenstein, faculty coordinator.

Undergraduates interested in an international relations concentration should see Professor Katzenstein.

**Program on Science, Technology, and Society**

Dr. Walter R. Lynn, director, 632A Clark Hall, 255-3810

The Program on Science, Technology, and Society (STS) is an academic unit that engages in teaching and research involving the interactions of science and technology with social and political institutions. In collaboration with other University departments and centers, the STS program participates in the development of interdisciplinary courses at both the graduate and undergraduate levels. These courses are designed to synthesize the perspectives of several academic disciplines in the analysis of relationships between science and technology on one hand and today's society on the other. Current course and research topics include science, technology, and public policy; biology and society; science and law; arms control and national defense policies; energy policy; environmental policy and ethics; health and safety regulation; biomedical ethics; science policy; science and technology for development; scientific and technological literacy; and citizen participation in technical decision making. The program draws its students, faculty, and research staff from the various divisions of the University.

**Biological and Society Major**

Developed initially by STS, the undergraduate curriculum in biology and society is a major in the College of Arts and Sciences and in the College of Human Ecology. It is also offered as an optional curriculum for undergraduates entering the General Studies Program of the New York State College of Agriculture and Life Sciences.

**Graduate Studies**

STS does not enroll students for advanced degrees. Rather, the program cooperates with departments in the various colleges to facilitate curriculum development and research interests in the interrelations of science, technology, and social policy. Faculty and students affiliated with the STS program are also members of graduate fields of study such as anthropology, city and regional planning, ecology, the various engineering fields, government, philosophy, sociology, and toxicology. It is possible to undertake research and course work in the area of science, technology, and society within one of the above-mentioned fields, as well as others. A minor concentration in science and technology policy is available within the graduate minor field of public policy.
and in the Master of Professional Studies (International Development) degree. Further information about these graduate programs may be obtained by contacting the Graduate School.

Courses

STS courses are cosponsored by the University academic departments. The titles and numbers of these courses are listed below, for course content and other details, refer to the listings of the particular cosponsoring department. Further information concerning the program, including a list of STS-related courses offered throughout the University and information concerning individualized courses of study, may be obtained from the program office, 632 Clark Hall (telephone: 255-3810).

**Biological and Society Courses**

Medical Ethics (Biological Sciences 205, Philosophy 245, and Biology and Society 205)

History of Biology (History 287, Biological Sciences 201, and Biology and Society 287)

Environmental Sciences (Biological Sciences 206, Philosophy 246, and Biology and Society 206)

History of Biology (History 286, Biological Sciences 202, and Biology and Society 288)

Biological and Societal I: The Ecological Perspective (Anthropology 301, Biological Sciences 301, and Biology and Society 301)

Food, Agriculture, and Society (Biological Sciences 302 and Biology and Society 302)

Professional Ethics (Biology and Society 311)

The Anthropology of Medicine (Anthropology 312 and Biology and Society 312)

Human Growth and Development: Biological and Social Psychological Considerations (Human Development and Family Studies 347, Nutritional Sciences 347, and Biology and Society 347)

Independent Study (Biology and Society 375)

Health and Disease in German Literature 227

Psychology 387, and Biology and Society 327)

Introduction to Public Health (Human Service Studies 490 and Biology and Society 403)

Recombinant DNA Technology and Its Applications (Biological Sciences 232 and Biology and Society 232)

Culture and Human Disease (Anthropology 356 and Biology and Society 356)

Human Fertility in Developing Nations (Sociology 404 and Biology and Society 404)

Honors Project (Biology and Society 499)

Seminar in the History of Biology (History 447 and Biology and Society 401)

The Human and Ecological Consequences of Nuclear War (Peace Studies 402 and Biology and Society 411)

Seminar in the History of Biology (History 448 and Biology and Society 402)

Agriculture, Society, and Biotechnology (Rural Sociology 406 and Biology and Society 408)

Population Policies (Sociology 414 and Biology and Society 414)

Writing as a Naturalist (Biology and Society 102)

Ecosystems and Ego Systems (Biology and Society 104)

Medical Metaphors and Their Cultural Functions (Biology and Society 328 and German Literature 328)

Biology and Society Undergraduate Seminar (Biology and Society 403)

Agriculture, Society, and the Environment (Biology and Society 412, Agriculture and Life Sciences 469, and Biological Sciences 469)

Medicine and the Law (Biology and Society 426)

Risk Management of Toxic Chemicals (Biology and Society 459 and Toxicology 659)

Human Nature: An Evolutionary Perspective (Biology and Society 476 and Anthropology 476)

Issues in Biotechnology, Society, and Law (Biological Sciences 406 and Biology and Society 406)

The Politics of Technical Decisions I (Biology and Society 411, Sociology 312, City and Regional Planning 541, Government 628, and Management NBA 686)

Medical Service Issues in Health Administration (Biological Sciences 629, Human Service Studies 628, and Biology and Society 428)

Social and Political Studies of Science (Sociology 355, City and Regional Planning 422, and Biology and Society 442)

Environmental Policy (Agriculture and Life Sciences 661, Biological Sciences 661, and Biology and Society 461)

**Other Courses by STS Faculty**

The Politics of Technical Decisions I (Sociology 515, City and Regional Planning 541, Government 628, and Management NBA 686)

The Politics of Technical Decisions II (Sociology 516, City and Regional Planning 542, Government 629, and Management NBA 687)

Social and Political Studies of Science (Sociology 355 and City and Regional Planning 442)

Regulation of Toxic Substances (Civil and Environmental Engineering 627 and Toxicology 627)

Special Topics in Toxicology (Toxicology 699)

Science and Human Nature (Philosophy 286)

Introductory Health Services: Organization and Financing (Management NBA 381)

Environmental Law I (Civil and Environmental Engineering 625 and Toxicology 625)

Urban Affairs Laboratory (Government 312)

Regulation of Toxic Substances (Civil and Environmental Engineering 627 and Toxicology 627)

Transportation Economics (Civil and Environmental Engineering 666)

Program in Comparative and Environmental Toxicology

C.F. Wilkinson, director. 2002 Martha Van Rensselaer Hall, 255-810 or 255-3113

The Cornell Program in Comparative and Environmental Toxicology is coordinated and facilitated by the Institute for Comparative and Environmental Toxicology (ICET). ICET serves as a focal point for all research, teaching, and cooperative extension activities in the broad interdisciplinary area of environmental toxicology. Cornell and encourages the development of collaborative programs between faculty members in many University departments.

**Graduate Studies**

The major in the graduate field of Environmental Toxicology promotes training leading to the M.S. or Ph.D. degrees and provides both breadth and depth in environmental toxicology and related disciplines. The program offers a combination of research and didactic training that is designed to prepare students for solving the problems of modern toxicology. Specialization tracks include biochemical, genetic, nutritional, and veterinary toxicology; ecotoxicology; and policy issues associated with the use, risk management, and regulation of toxic substances. Research of the faculty associated with the program is focused on the interactions of drugs, pesticides, and other potentially hazardous environmental agents with a wide variety of living organisms (including humans) and with the ecosystems with which these organisms are associated.

**Courses**

Courses in environmental toxicology are cosponsored by the University academic departments and are open to all graduate students and to those undergraduates who have permission of the instructor. The titles and numbers of these courses and the numbers of course content are provided elsewhere in the catalog under the listings of the cosponsoring department. Further information concerning the program and the development of the curriculum may be obtained through the graduate field representative, 632 Clark Hall (telephone: 255-607).

- Tax 370: Pesticides in the Environment (Entomology 370)
- Tax 418: Mutagenesis and Genetic Toxicology (Animal Science 418)
- Tax 419: Animal Cytogenetics (Animal Science 419)
- Tax 438: Cell Proliferation and Oncogenic Viruses (Biological Sciences 438)
- Tax 528: Pharmacology (Veterinary Medicine 528)
- Tax 607: Ecotoxicology (Natural Resources 607)
- Tax 609: Effects of Ecological Perturbations on Fishes (Natural Resources 609)
- Tax 610: Introductory Chemical and Environmental Toxicology (Food Science 610)
- Tax 611: Molecular Toxicology (Nutritional Sciences 611)
- Tax 621: Clinical Veterinary Toxicology (Veterinary Medicine 621)
- Tax 625: Environmental Law (Civil and Environmental Engineering 625)
- Tax 627: Regulation of Toxic Substances (Civil and Environmental Engineering 627)
- Tax 640: Principles of Toxicological Pathology (Veterinary Medicine 640)
- Tax 651: Nutrition and the Chemical Environment (Nutritional Sciences 651)
- Tax 659: Risk Management of Toxic Chemicals (Biological Sciences 659 and Biology and Society 659)
- Tax 660: Safety Evaluation in Public Health (Veterinary Medicine 660)
- Tax 690: Insect Toxicology and Insecticidal Chemistry (Entomology 690)
- Tax 698: Current Topics in Environmental Toxicology (Nutritional Sciences 698)
- Tax 700: Ecotoxicological Methods (Natural Resources 700)
- Tax 702: Seminar in Toxicology (Nutritional Sciences 702)
- Tax 751: Professional Responsibilities of Toxicologists (Biological Sciences 751)
- Tax 799: Master's Thesis and Research
- Tax 999: Doctoral Thesis and Research

Visual Studies

Robert Ascher, Department of Anthropology, and Marilyn Rivchin, Department of Theatre Arts, advisers

**Visual Studies** as a distinct area of intellectual activity comprehends the analysis of visual forms, especially symbolic visual forms, in historical, scientific, sociological, and aesthetic points of view. Images can be analyzed within a variety of contexts and by means of a variety of methods, and their study is therefore ideally combined with interdisciplinary terms. And since the creation of images has an important bearing on their analysis, Visual Studies concerns itself with practice as well as theory.

In addition to the courses listed below, which represent only a sampling of formal curricular offerings pertinent to visual studies, interested students should be aware of the programs and facilities available in the Herbert F. Johnson Museum of Art and the ETV Center of the College of Human Ecology, as well as the frequent showings sponsored by Cornell Cinema and Pentangle II.

**Courses**

Some of these courses may not be taught in 1986–87. For information about availability consult the appropriate departmental listings.

- **America in the Camera's Eye (History 246)**
- **Apparel Design II (Textiles and Apparel 264)**
- **Cinema to Literature (Italian 396)**
- **Color, Form, Space (Art 110)**
- **Computer Graphics (Architecture 334 and Computer Science 417)**
- **Contemporary American Theater (English 455)**
- **Design I and II (Design and Environmental Analysis 101–102)**
- **Documenting the Depression: Film, Literature, and Memory (History 476)**
Advanced Placement of Freshmen

The final decision for awarding advanced placement credit at Cornell rests with each individual college. The appropriate department of instruction within the University sets the standards of achievement that must be met for advanced placement and recommends AP credit for those who meet the standards. This recommendation is almost always based on some examination score. For policies governing advanced placement in a specific college, see the academic information section of that college. Students need not accept advanced placement. They may repeat the course, thereby relinquishing the advanced placement credit.

The Advanced Placement (AP) Program of the College Entrance Examination Board (CEEB) is the best-known and most generally used of the programs that provide students with an opportunity to document participation in a college-level curriculum at the secondary level.

Advanced placement examinations. Examinations sponsored by the Advanced Placement Program of the College Entrance Examination Board are considered. Entering freshmen should have their scores sent to their college or school office (see the list at the end of this section). Placement and credit on the basis of these examinations will usually be determined during the summer, and students will be notified before course scheduling.

Departmental advanced standing examinations. In certain subjects, students may also qualify for advanced placement or credit both on the basis of departmental examinations given on campus during orientation week. A schedule of these examinations will appear in the orientation booklet that will be mailed to entering students in late summer. The departments that award advanced placement and credit on the basis of CEEB Advanced Placement Examinations or departmental examinations are shown below.

Transfer of credit. Entering freshmen who have completed college courses for which they wish to receive credit toward their Cornell degree should send transcripts and course descriptions to their college or school office (see the list at the end of this section). The award of credit or placement for such courses is determined by the appropriate departments according to individual school and college guidelines. Because policy for using advanced placement credit varies according to each college's or school's professional and academic goals, students should consult their college or school office to determine how they may use such credit.

Foreign credentials. Information regarding Cornell's advanced standing policy for foreign credentials may be obtained by contacting the Associate Director of International Admissions, Cornell University, 410 Thurston Avenue, Ithaca, New York 14850-2488, U.S.A. Students holding foreign credentials who feel they may be eligible for advanced standing consideration should contact the International Student Office prior to enrollment for clarification of the advanced standing policy.

Written inquiries. Many department, school, and college offices encourage students to contact them with any questions they may have. Addresses given in the following sections may be completed by adding Ithaca, New York 14853.

Forwarding of scores and transcripts. Entering freshmen should have their advanced placement test scores sent to their school or college office.

College of Agriculture and Life Sciences
M. B. Mullenhoff
192 Roberts Hall

College of Architecture, Art, and Planning
M. Sophie Newhart
147 Sibley Hall

College of Arts and Sciences
Michele T. Crane
M46 Goldwin Smith Hall

College of Engineering
Richard K. Mosher
170 Olin Hall

School of Hotel Administration
Mary Milks
138 Statler Hall

College of Human Ecology
Joyce H. McAllister
146 Martha Van Rensselaer Hall

School of Industrial and Labor Relations
Virginia W. Freeman
101 Ives Hall

Biological Sciences

The Division of Biological Sciences grants advanced placement credits and exemption from introductory biology courses based on superior performance on the CEEB Advanced Placement Examination in biology.

Any student who earns a score of 5 on this examination may elect to receive eight credits and be permitted exemption from all introductory biology courses. Students not majoring in biological sciences who score a 4 or 5 may receive, respectively, six or eight advanced placement credits. This will satisfy the distribution requirement in biological sciences for students in the College of Arts and Sciences and the College of Human Ecology, and a portion of the group B distribution requirement for students in the College of Agriculture and Life Sciences.

Biological sciences majors and others expecting to take advanced biology courses who receive a score of 4 must fulfill the introductory biology requirement by taking Biological Sciences 101–103 or 102–104 (Biological Sciences, Lectures and Laboratory). These students should consult information available in the course office (1140 Comstock Hall) and in the Biology Center (G20 Silmton Hall) to determine which semester to take to complete the introductory biology requirement. For students in doubt, Biological Sciences 101–104 is advised. These students will receive a total of eight introductory biology credits (four advanced placement credits plus four course credits).

Chemistry

The Department of Chemistry offers two sequences that satisfy prerequisites for further work in the department: Chemistry 207–208, an eight-credit sequence that includes qualitative and quantitative analysis, and Chemistry 215–216, a nine-credit sequence that includes qualitative and quantitative analysis.

Freshmen may qualify for advanced placement and advanced standing credits in chemistry by satisfactory performance on the CEEB Advanced Placement Examination in chemistry or by passing an advanced standing examination offered by the department. A score of 5 on the CEEB examination entitles a student to 8 credits. A score of 3 or 4 qualifies a student for 4 credits. A score of 3 indicates minimal understanding of principles, and students with a score of 3 who plan to take further work in chemistry are strongly advised to take Chemistry 207. A student may also earn four or eight credits by suitable performance on the departmental examination. To take the departmental examination students must sign up, on the morning of the day of the examination, with Dr. Stanley Marcus, in 160 Baker Laboratory.

The specific course in which a student will register after having received a certain advanced placement standing will be decided by consultation between the student, his or her adviser, and the professors teaching
History

The Department of History will grant four credits to students who score 4 or 5 on the CEEB Advanced Placement Examination in European history and four credits to those with such scores in the American history examination. Such credits are granted automatically, without application to the department.

These credits may not be used to fulfill requirements of the History major or distribution requirements of the College of Arts and Sciences.

History of Art

The Department of History of Art will grant three credits to students who score 4 or 5 on the CEEB Advanced Placement Examination. Students may be eligible to register for 300-level courses in the Department of History of Art. Questions concerning advanced placement may be directed to the department chairman, Cornell University, 35 Goldwin Smith Hall.

Modern Languages

Language placement tests. Students who have studied a language for two or more years and want to continue study in that language at Cornell must present the results of a College Placement Test (CPT). Language course placement is made using guidelines that match CPT reading scores with various levels of courses. In cases where no CPT exists for a particular language, the Department of Modern Languages and Linguistics designates a professor to handle placement for that language. Students who have had a year of formal study or substantial informal study since they last took a CPT should take the examination again during orientation week if they plan to continue course work.

Advanced standing credit. Advanced standing credit may be entered on a student’s record as follows:

1) For high school work, three to six credits may be granted for the equivalent of 200-level courses. Credit is based on performance on the CEEB Advanced Placement Examination, Cornell's Advanced Standing Examination (CASE), or a special departmental examination. To be eligible for Cornell's Advanced Standing Examination, students must have earned a score of 850 or above on the reading section of the College Placement Test (CPT). A student who has received three credits by scoring 4 or 5 on the CEEB Advanced Placement Examination is advised to take the Cornell Advanced Standing Examination. Outstanding performance on this examination could provide three additional credits.

2) For formal language work at an accredited college, credit is considered by the department upon submission of a transcript and may be entered on the student's Cornell record.

3) Native speakers of languages other than English may, upon examination by the appropriate professor, be granted a maximum of six credits if they can demonstrate proficiency equivalent to course work on the 200 level or above at Cornell. Additional credit will be considered only for those who pursue advanced work in their native language.

Information about times and places to take placement tests is available in the orientation booklet, from Academic and Career Counseling Services, and from the Department of Modern Languages and Linguistics. Students must register for the CPT examination at Academic and Career Counseling Services, 203 Barnes Hall, and pay a fee. For more information, see the College of Arts and Sciences section on language course placement, or contact the Department of Modern Languages and Linguistics, Cornell University, 203 Morrill Hall.

Mathematics

The Cornell calculus sequences discussed below are described under "Basic Sequences" in the Department of Mathematics section of this Announcement.

The regular freshman calculus courses at Cornell do not differ substantially from calculus courses given in many high schools, and it is best to avoid repeating material that has already been covered at an appropriate level. Secondary school students who have had the equivalent of at least one semester of analytic geometry and calculus should, if possible, take one of the CEEB's two Advanced Placement Examinations (calculus AB or calculus BC) during their senior year. The following rules do not apply to students being admitted to the College of Engineering. See the college's brochure for a detailed statement.

Students with a grade of 4 or 5 on the BC examination may take the appropriate third-semester course (Mathematics 293 or 221) or the sequence 214–215–216–218, but students entering Mathematics 293 may have to make up some material on partial differentiation. Students with a 3 on the BC examination or a 4 or 5 on the AB examination may take the appropriate second-semester course (Mathematics 192, 122, or 112). Students with a 2 on the BC examination or a 3 on the AB examination may take one of the second-semester courses (Mathematics 192 or 112). Advanced placement credit will be awarded appropriately, however no credit will be granted for a grade of 1 on the BC or 1 or 2 on the AB examination.

A grade of 3 or higher on the BC examination satisfies the distribution requirement in mathematics for students in the College of Arts and Sciences.

Note, however, that the grade of 3 is not sufficient for a full year of advanced placement credit in mathematics. The placement examination in mathematics is offered at Cornell only during orientation week and should be taken by students who

1) have had at least a semester of calculus but did not take a CEEB Advanced Placement Examination;

2) have received a 2 on the BC examination or a 3 on the AB examination and want to enter the upper sequence; or

3) believe that the placement assigned on the strength of the CEEB Advanced Placement Examination is not high enough in their case.

Students are strongly urged to take the departmental placement test even if they feel that their grasp of the material is uncertain. The grade on this test does not become part of a student's record. No advance registration for the departmental examination is necessary.
### Advanced Placement Program (CEEB) Examinations

#### Summary of Credit and Placement

<table>
<thead>
<tr>
<th>Subject</th>
<th>Score</th>
<th>Advanced Placement Credit</th>
<th>Placement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Placement of Freshmen is Advanced Placement Program (CEEB) Examinations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Subject</strong></td>
<td><strong>Score</strong></td>
<td><strong>Advanced Placement Credit</strong></td>
<td><strong>Placement</strong></td>
</tr>
<tr>
<td><strong>Arabic</strong></td>
<td>Department determines credit and placement based on departmental examination.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Biology</strong></td>
<td>5 (majors)</td>
<td>8 credits</td>
<td>Placement out of all introductory courses.</td>
</tr>
<tr>
<td></td>
<td>5 (nonmajors)</td>
<td>8 credits</td>
<td>Satisfies the introductory biological sciences distribution requirement.</td>
</tr>
<tr>
<td></td>
<td>4 (majors)*</td>
<td>4 credits</td>
<td>4 AP credits awarded after completion of 101–103 or 102–104.</td>
</tr>
<tr>
<td></td>
<td>4 (nonmajors)</td>
<td>6 credits</td>
<td>Placement out of 109–110. Satisfies the biological sciences distribution requirement but does not always satisfy the prerequisite for second- and third-level courses in biology.</td>
</tr>
<tr>
<td><strong>Chemistry</strong></td>
<td>5</td>
<td>8 credits</td>
<td>Department determines placement.</td>
</tr>
<tr>
<td></td>
<td>3.4</td>
<td>4 credits</td>
<td>Department determines placement.</td>
</tr>
<tr>
<td><strong>Computer science</strong></td>
<td>Department determines credit and placement based on CEEB Achievement Examination.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Economics</strong></td>
<td>Department determines credit and placement.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>English</strong></td>
<td>Department uses additional measures. Qualified students are notified.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>French language</strong></td>
<td>4.5</td>
<td>3 credits</td>
<td>Department determines placement.</td>
</tr>
<tr>
<td><strong>French literature</strong></td>
<td>4.5</td>
<td>3 credits (and proficiency)</td>
<td>Department determines placement. Students may earn additional credit by taking departmental examination.</td>
</tr>
<tr>
<td><strong>German language</strong></td>
<td>4.5</td>
<td>3 credits</td>
<td>Department of Modern Languages and Linguistics determines placement. Students may earn additional credit by taking CASE examination.</td>
</tr>
<tr>
<td><strong>German literature</strong></td>
<td>4.5</td>
<td>3 credits (and proficiency)</td>
<td>Department determines placement. Students may earn additional credit by taking departmental examination.</td>
</tr>
<tr>
<td><strong>Greek</strong></td>
<td>4.5</td>
<td>Department determines credit and placement based on departmental examination.</td>
<td></td>
</tr>
<tr>
<td><strong>Hebrew</strong></td>
<td>Department determines credit and placement based on departmental examination.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>American history</strong></td>
<td>4.5</td>
<td>4 credits</td>
<td>Department determines placement.</td>
</tr>
<tr>
<td><strong>European history</strong></td>
<td>3</td>
<td>4 credits</td>
<td>Department determines placement.</td>
</tr>
<tr>
<td><strong>History of art</strong></td>
<td>4.5</td>
<td>3 credits</td>
<td>Department determines placement.</td>
</tr>
<tr>
<td><strong>Italian literature</strong></td>
<td>4.5</td>
<td>3 credits (and proficiency)</td>
<td>Department of Romance Studies determines placement.</td>
</tr>
<tr>
<td><strong>Latin</strong></td>
<td>4.5</td>
<td>Department determines credit and placement based on departmental examination.</td>
<td></td>
</tr>
<tr>
<td><strong>Mathematics BC</strong></td>
<td>4.5</td>
<td>8 credits</td>
<td>Placement out of 111, 112. Permission to take 221 or 293 or 214–215–216–218.</td>
</tr>
<tr>
<td>(excluding engineering students; see p. 00)</td>
<td>3</td>
<td>4 credits</td>
<td>Placement out of 111. Permission to take 112, 122, or 192.</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>4 credits</td>
<td>Placement out of 111. No advanced placement credit for students who take 111. Permission to take 112 or 192.</td>
</tr>
<tr>
<td><strong>Mathematics AB</strong></td>
<td>4.5</td>
<td>4 credits</td>
<td>Placement out of 111. Permission to take 112, 122, or 192.</td>
</tr>
<tr>
<td>(excluding engineering students; see p. 00)</td>
<td>3</td>
<td>4 credits</td>
<td>Placement out of 111. Permission to take 112 or 192. Students are strongly urged to take the mathematics placement examination.</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>none</td>
<td></td>
</tr>
<tr>
<td><strong>Music</strong></td>
<td>Department determines credit and placement based on departmental examination.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Physics B‡</strong></td>
<td>4.5</td>
<td>8 credits</td>
<td>Placement out of Physics 101–102.</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>4 credits</td>
<td>Placement out of Physics 101.</td>
</tr>
<tr>
<td><strong>Physics B, and Mathematics BC‡</strong></td>
<td>5</td>
<td>4 credits in physics</td>
<td>Student may choose placement out of Physics 112 or 207 instead of Physics 101–102.</td>
</tr>
<tr>
<td>or Mathematics AB‡</td>
<td>5</td>
<td>4 credits in physics</td>
<td>Student may choose placement out of Physics 112 or 207 instead of Physics 101–102.</td>
</tr>
<tr>
<td><strong>Physics C—Mechanics‡</strong></td>
<td>4.5</td>
<td>4 credits</td>
<td>Placement out of Physics 112 or 207.</td>
</tr>
<tr>
<td><strong>Physics C—Electricity and Magnetism‡</strong></td>
<td>5</td>
<td>Choice of acceptance of 4 credits for Physics 208 (or 213) or placement into Physics 217 with no AP credit. See department representative.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Choice of acceptance of 4 credits for Physics 208 or placement into Physics 217 with no AP credit. See department representative.</td>
<td></td>
</tr>
<tr>
<td><strong>Psychology</strong></td>
<td>4.5</td>
<td>3 credits</td>
<td>Department determines placement.</td>
</tr>
<tr>
<td><strong>Sociology</strong></td>
<td>Department determines credit and placement.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Spanish language</strong></td>
<td>4.5</td>
<td>3 credits</td>
<td>Department determines placement.</td>
</tr>
<tr>
<td><strong>Spanish literature</strong></td>
<td>4.5</td>
<td>3 credits (and proficiency)</td>
<td>Department determines placement. Students may earn additional credit by taking departmental examination.</td>
</tr>
</tbody>
</table>

*Biological sciences majors and other students who expect to take advanced biology courses. These students will receive a total of 8 introductory biology credits (4 advanced placement credits and 4 course credits).*

*Cornell Advanced Standing Examination. Contact the Department of Modern Languages and Linguistics, 203 Morrill Hall.*

*In the College of Arts and Sciences, AP credit may be used to satisfy one-half the distribution requirement in science. See p. 99.*
Near Eastern Studies

For advanced placement and credit in Hebrew and Arabic, students should consult the Department of Near Eastern Studies, Cornell University, 360 Rockefeller Hall. Advanced placement and credit are determined by departmental examination.

Physics

Advanced placement and credit are awarded on the basis of the CEEB Advanced Placement Examination in physics (physics B or physics C), certain international examinations, or the departmental examination (which may be taken during orientation week or at other times as arranged). For permission to take the departmental examination, students should consult Professor R. Cotts, 522 Clark Hall.

Physics B. Students earning a score of 4 or 5 may receive eight credits for Physics 101 or 102. Those earning a score of 5 in physics B with a score of 4 or 5 in calculus BC or a score of 5 in calculus AB may choose to accept four credits in Physics 112 or 207 instead of eight credits in Physics 101 and 102. Those earning a score of 3 will receive four credits in Physics 101.

Physics C.
1) C—Mechanics. Students earning a score of 4 or 5 may receive four credits for Physics 112 or 207.
2) C—Electricity and Magnetism. Students earning a score of 5 will be eligible for four credits for Physics 208 or 213, or for placement into Physics 217 with no AP credit. Students earning a score of 4 will be eligible for four credits for Physics 208 or placement into Physics 217 with no AP credit. Students with scores of 4 or 5 should first meet with the department representative, Professor R. Cotts, 522 Clark Hall, for advice on making a selection.

Advanced placement into a next-in-sequence course depends on the completion of the appropriate mathematics prerequisites before enrolling. To qualify for advanced placement credit it is not necessary to continue the study of physics.

General information and advice may be obtained from Professor R. Cotts, 522 Clark Hall, or from the Department of Physics, Cornell University, 109 Clark Hall.

Psychology

Students who scored 4 or 5 on the CEEB College-Level Examination Program psychology test may receive 3 advanced placement credits in psychology. Those interested in taking further courses in psychology should consult a faculty member in the Department of Psychology, Cornell University, 232 Uris Hall.

Advanced placement based on the CEEB test may not be used to satisfy the distribution requirement in the College of Arts and Sciences. Credit toward the requirements of a major in psychology will depend on the recommendation of the student's major adviser.

Romance Studies (French and Spanish Literature)

The Department of Romance Studies grants three credits to students with a score of 4 or 5 on the Advanced Placement Examination in French or Spanish literature or in French or Spanish language.

For information about the College Placement Test, see "Modern Languages," above.

Special Academic Services and Programs

Freshman Seminar Program

Each semester, the Freshman Seminar Program presents a choice of more than ninety courses offered by over twenty-five different departments in the humanities, social sciences, expressive arts, and sciences. These courses share one purpose: to offer the student practice in writing English prose. They also ensure that beginning students may enjoy the benefits of a class no larger than seventeen students. In addition, Freshman Seminars follow a common set of guidelines:

1) at least thirty pages of assigned writing
2) at least eight (and, at most, about fourteen) written assignments
3) opportunities for serious revision—not mere editing—of essays. (At least some of these revising assignments may satisfy 1 and 2 above.)
4) ample classroom time spent on work directly related to writing
5) reading assignments small enough (about a hundred pages a week, at most) to permit regular, concentrated work on writing
6) individual conferences.

The present catalog describes representative Freshman Seminars, but offerings are subject to change from semester to semester (see the section "Special Programs and Interdisciplinary Studies" in the course listings for the College of Arts and Sciences). Most undergraduate students are required to take two courses in the Freshman Program in Architecture, Art, and Planning; students, however, need only one Freshman Seminar; Hotel students must fulfill their requirement through Hotel Administration 165, which is to be taken with Hotel Administration 265 during the first two semesters at Cornell. Agriculture and Life Sciences students can take Freshman Seminars or choose from among a variety of writing courses outside the Freshman Seminar Program to fulfill their requirement.

The Freshman Seminar Program reserves proportional space in each seminar for every college; because enrollment is limited, however, some students may not get their first choice. Students should therefore be prepared to come to a Freshman Seminar course—exchange session and take a second- or third-choice seminar. Each term, the Freshman Seminar offerings are described in a brochure available from college registrars, and just before registration and course exchange these brochures are updated in a supplement also available from college registrars.

Special arrangements are made for nonnative speakers of English scoring less than 600 on the Test of English as a Foreign Language (TOEFL) examination and for freshmen needing more than the usual amount of work in writing. Freshmen (or transfers needing Freshman Seminar Program credit) in either of these two categories should attend the assessment sessions offered by the Writing Workshop during orientation week (the workshop offices are in 174 Rockefeller Hall; the director is Nancy Kaplan). The Writing Workshop also offers Writing 137 (fall) and 138 (spring), tutorials in English composition designed for students who have had little training in composition or who have serious difficulty with writing assignments. Writing 137 and 138 are graded S-U only, and all students receiving a grade of S will be granted course credit towards graduation. Students whose writing displays sufficient competence will also be granted Freshman Seminar credit.

The workshop also offers a walk-in service to help students with specific problems of essay-writing. Transfer students should see if college-level work done elsewhere will exempt them from all or part of the written expression requirement. Upper-division students sometimes take a writing course outside the Freshman Seminar Program and petition to have it satisfy part of the requirement. Students should consult the person responsible for advanced placement in their colleges before approaching the Freshman Seminar Program staff about transfer credit.

Students in the College of Arts and Sciences who are particularly well prepared in composition and who have three English advanced placement (AP) credits must still take two Freshman Seminars to complete their requirement, but they are eligible to take English 270, 271, or 272 (or any other Freshman Seminar). Arts students with six English AP credits need only one Freshman Seminar to complete the college requirement. Agriculture and life sciences, engineering, and industrial and labor relations students with three English AP credits are exempted from one writing course, and students in these three colleges with six English AP credits are exempted from two writing courses. Students from other colleges should check with staff in charge of advanced placement in those colleges about English AP credit and the writing requirement.

In the fall, students will attend a special Freshman Seminar registration and enrollment course registration. The dates for Freshman Seminar fall registration and course exchange appear in the Freshman Seminar brochure; the dates for spring pre—course enrollment and registration—which coincide with the Freshman Seminar dates—appear in the Cornell University calendar in the front of this Announcement.

The director of the Freshman Seminar Program is Harry Shaw, professor of English; the assistant director is Katherine K. Gottschalk, senior lecturer in English. The office manager is Mark E. Habibet. The program's offices are in 159 Goldwin Smith Hall (telephone: 255-4061).

The Learning Skills Center

The Learning Skills Center (LSC) is a central academic support service at Cornell University. Its purpose is to assist students in the development of learning strategies, skills, and insights that lead to academic success. The Learning Skills Center serves any student who needs its program, but places particular emphasis on special programs students, including students in HEC, EOP, COSEP or the Division of Underclassified Students. The LSC provides supplemental instruction in core courses (biology, chemistry, mathematics, physics) and tutorial and study sessions. A refresher summer program is available to COSEP students, which provides an opportunity to develop academic skills before fall enrollment. The LSC has study-hall accommodations and provides students access to microcomputers, a reserve library, an examination file, audio study-tapes, and xeroxing.

Reading and Study Skills Program. This program offers courses in speed reading and a variety of study skills. Special emphasis is placed on how to read texts, budget time, and prepare for examinations. A credit course is offered on reading and learning strategies through the College of Human Ecology. In addition, audio cassettes on these topics are maintained at the LSC, the Media Room in Uris Library, the reserve desk of Mann Library, and the three student unions. The Reading and Study Skills Program is located in the Learning Skills Center, 375 Olin Hall.

Tutoring Services

The Interfraternity Council provides tutors without fee to any student who needs help with a course. Tutors are available on a virtual or walk-in basis by appointment. For more information, students should call 255-5183 or stop at the IFC office, 210 Willard Straight Hall.
Cornell Abroad

International study experience is recognized as a valuable educational opportunity for Cornell students. Cornell began administering study abroad programs in fall 1965 with program sites in Great Britain, Denmark, Spain, Germany, Switzerland, Israel, and Egypt. Cornell's program in France opens in fall 1966, and a program in Italy is expected to begin in 1967. Programs in Spain, Switzerland, France, and Germany require the equivalent to two years of college-level language study. Those in Spain, Switzerland, France, and Germany have resident faculty directors. All programs integrate Cornell students as much as possible into local university life, including classes and living arrangements. Information on these programs, as well as programs sponsored by other educational institutions and direct enrollment in foreign institutions, is available from the Career Center and the academic advising office in each college.

Agriculture and life sciences
Donald Burgett, 17 Roberts Hall
Architecture, art, and planning
Professor Christian Otto, 140 Sibley Dome
Arts and sciences
Assistant dean Beatrice Rosenberg, 55 Goldwin Smith Hall
Engineering
Associate dean Richard Lance, 219 Kimball Hall
Hotel administration
Professor John Knight, 325 Statler Hall
Human Ecology
Margaret Thomas, 154 Martha Van Rensselaer Hall
Industrial and labor relations
Laura Lewis, 101 Ives Hall

Students should plan to include language study in their schedules during the first two years. Admission to many foreign study programs requires a strong academic record, generally a B average or above. Further information on study abroad may be obtained in the college advising offices, in the Cornell Abroad office, or from the director of undergraduate studies in each department.

Counseling and Academic Advising Services

Students who receive degrees without ever needing or wanting advice are rare. The University encourages students to ask for assistance and advice whenever they need it, and numerous advising services exist on campus.

Many students are specifically assigned a faculty adviser for all or part of their undergraduate career. Faculty members can provide a wide range of advice, from suggestions about courses to take, books to read, or facilities to use, to specific information about college or departmental regulations.

Most schools and colleges have advising programs, which are described in their sections. Offices that offer specific kinds of counseling, available to any student at Cornell, are briefly described below.

Career Center and College Career Offices

The Career Center, an academic support service, and the college career offices work together to help students explore, discover, and choose a career. The Career Center provides assistance in six major areas: academic and career counseling, career information, health careers, job hunting, special programs for minorities, and professional and graduate schools. Professional advisers and counselors as well as student advisers are available. Career Center offices are located in Sage Hall and Barnes Hall and are open Monday through Friday from 8:00 a.m. to 4:30 p.m. The Sage Hall office, at 14 East Avenue (telephone: 255-5221), houses an extensive career library with up-to-date resources on careers and career decision making, employment, graduate and professional schools, study-abroad programs, and health careers and a variety of audio- and videotapes for each area. It also offers seminars on applying to graduate and professional schools, assists students in job hunting through on-campus interviews with employers and the Cornell Connection, and provides special programs and advice for minority students.

The office in 203 Barnes Hall (telephone: 255-5044) provides academic and career counseling to individuals and groups, conducts academic and vocational testing, and administers language placement tests for students enrolling in foreign language courses. It maintains a credential service for letters of recommendation, transcripts, and other personal documents retained and distributed by request to employers and graduate and professional schools. It also provides special information resources and advice for students interested in careers or professional schools in the health fields.

College career offices, located in each of the undergraduate colleges, provide services tailored to the curricula and career goals of each college's students. Services vary from office to office but generally include career libraries, job listings, summer job and internship programs, job-preparation workshops, on-campus recruiting, and individual counseling. Special services provided by the college offices include computer-assisted career guidance, career days, and alumni programs. Students may take advantage of services offered by both their college offices and those of the Career Center. Most college offices are open Monday through Friday from 8:00 a.m. to 5:00 p.m.

Services for the Disabled

As a university committed to the principle of equal opportunity, Cornell must make its academic and social resources fully available to all who are qualified, including persons with disabilities such as loss of sight, hearing impairments, neurological limitations, limited mobility, or learning disabilities.

Cornell desires to provide access in as integrated and natural a setting as possible; the emphasis is on bringing the student to the class rather than on bringing the class to the student. A campus-wide program to provide ramps, curb cuts, and remodeled rest-room facilities has been completed. Special parking permits for the disabled can be obtained from the Traffic Bureau, and arrangements for accessible accommodations in residence hall facilities are available for individual students.

Kathleen Donovan, Office of Equal Opportunity, 234 Day Hall (telephone: 255-5296), is the campus coordinator for matters concerning the disabled. Those who have any questions are urged to get in touch with her for discussion and, where appropriate, referral to the proper resource person. Anyone who will need special accommodations either in his or her living situation or with classes should contact her as soon as possible.

Each school within Cornell University has designated a representative to assist disabled students with such matters of academic concern as course scheduling, classroom changes, and special provisions for taking examinations. Their names are listed in a brochure for disabled students that may be obtained from the coordinator for the disabled, 234 Day Hall.

Minority and Special Opportunity Programs

Cornell University administers a variety of programs designed to provide academic and personal support to minority and low-income students who meet program guidelines.

In 1963 President James A. Perkins founded the Committee on Educational Projects (COSEP) in accordance with Cornell's mission as a land-grant institution and its founding philosophy: "I would found an institution where any person can find instruction in any study." Cornell seeks to recruit and admit minority students with outstanding credentials as well as those with strong promise for academic success but whose secondary school profiles are not as competitive because of disadvantaged educational and economic backgrounds. COSEP provides a comprehensive support program for minority students who have been admitted to one of Cornell's undergraduate schools or colleges.

The main goals of the program are to:
1) assist in the University's effort to increase the enrollment of minority students who have traditionally been underrepresented in higher education;
2) provide supportive services after admission for academic, personal, and social adjustment;
3) assist the schools and colleges in raising the retention and graduation rates for minority students;
4) encourage institutional change to ensure an excellent education for minority students.

State Programs (HEOP and EOP)

In 1969 COSEP was expanded by the addition of the New York State Educational Opportunity Program (Colleges of Agriculture and Life Sciences, and Human Ecology, and the School of Industrial and Labor Relations) and the Higher Educational Opportunity Program (Colleges of Architecture, Art, and Planning).
Financial Aid

Eligibility and Availability

Financial aid resources for undergraduate nonimmigrant foreign students are severely limited at Cornell. Consequently, the competition for these awards is keen, and only a small percentage of each entering class receives assistance. Students who receive financial aid are likely to be those with exceptional academic records, high test scores, strong potential for positive contributions to the Cornell community, and demonstrated financial need. Awards are a combination of scholarship, loan, and on-campus work.

If a student does not receive financial aid upon entering Cornell, there is little chance of obtaining aid in the future, except in the event of an unforeseen financial emergency. Should a student experience an unexpected financial problem after enrolling, he or she should immediately contact the International Student Office for assistance.

Nonimmigrant students who receive financial aid from the University must reapply for aid each year. Application forms are available from the International Student Office.

Personal Counseling Services

University Health Services. Counseling services are provided in the health center and the Psychological Service. For an appointment at the Psychological Service, students may call 255-5206 or go to the center. Workshops are also offered on a variety of health-related and personal-growth issues. More information may be obtained by calling Health Education at 255-4782.

Cornell United Religious Work (CURW). Diverse religious staff and denominational advisors provide general, religious, premarriage, couples, or crisis counseling and are available day or night by contacting the office, 118 Anabel Taylor Hall (telephone: 255-4214).

Empathy, Assistance, and Referral Service (EARS). Trained volunteers staff a walk-in and telephone peer counseling service for individual counseling and referral. EARS counselors are also available to present workshops on a variety of topics, including communication and listening skills, stress management, sexual harassment and rape, and sexism, racism, and heterosexism: the experience of oppression. Students can walk in to 211 Willard Straight Hall or call 255-EARS.

The Dean of Students’ Office provides crisis intervention, short-term counseling, and referral for students with adjustment, personal, relationship, and off-campus housing concerns; faculty and staff consultation; communication skills training; and coordination of EARS, ALERT, and personal-growth workshops on various topics. The office is located in 103 Barnes Hall (telephone: 255-4221 or 255-3608).

Suicide Prevention and Crisis Service is a twenty-four-hour hot-line and referral service for the entire community. In addition to crisis counseling, it provides hot-line and referral services for raped or battered women (telephone: 272-1616).

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Personal Counseling Services

University Health Services. Counseling services are provided in the health center and the Psychological Service. For an appointment at the Psychological Service, students may call 255-5206 or go to the center. Workshops are also offered on a variety of health-related and personal-growth issues. More information may be obtained by calling Health Education at 255-4782.

Cornell United Religious Work (CURW). Diverse religious staff and denominational advisors provide general, religious, premarriage, couples, or crisis counseling and are available day or night by contacting the office, 118 Anabel Taylor Hall (telephone: 255-4214).

Empathy, Assistance, and Referral Service (EARS). Trained volunteers staff a walk-in and telephone peer counseling service for individual counseling and referral. EARS counselors are also available to present workshops on a variety of topics, including communication and listening skills, stress management, sexual harassment and rape, and sexism, racism, and heterosexism: the experience of oppression. Students can walk in to 211 Willard Straight Hall or call 255-EARS.

The Dean of Students’ Office provides crisis intervention, short-term counseling, and referral for students with adjustment, personal, relationship, and off-campus housing concerns; faculty and staff consultation; communication skills training; and coordination of EARS, ALERT, and personal-growth workshops on various topics. The office is located in 103 Barnes Hall (telephone: 255-4221 or 255-3608).

Suicide Prevention and Crisis Service is a twenty-four-hour hot-line and referral service for the entire community. In addition to crisis counseling, it provides hot-line and referral services for raped or battered women (telephone: 272-1616).
Student Life and Activities

Dean of Students' Office
The primary aim of the Dean of Students' Office (DOS) is the personal, social, and intellectual development of students and the enhancement of the quality of the educational environment for the benefit of the entire community.

Specific responsibilities of the office include training and development of peer counseling groups such as EARS (Empathy, Assistance, and Referral Service), personal-growth groups that address student concerns in a supportive environment; new-student programs; fraternity and sorority advising; and off-campus life and housing. The office assists individuals who need to know which University department is best equipped to answer any particular question that may arise during the course of the year.

Staff serve as advocates for, and as consultants to, campus groups serving to resolve problems or improve programs. In addition, DOS assumes responsibility for organizing and supporting ad hoc groups to examine issues that cut across divisional boundaries, for example, racism, human relations, and alcohol abuse.

Another major responsibility of the office is the assessment and improvement of the University community through research and organizational development. Various publications are prepared by the DOS, including the Cornell Calendar; Policy Notebook for Students, Faculty and Staff; Off-Campus Housing in the Ithaca Area, Graduate Life at Cornell; and A Guide to Workshops at Cornell.

Students and staff are always welcome to drop in at the office in Barnes Hall or call (telephone: 255-4221) if they have any questions or concerns.

Housing
There is sufficient variety among University residences to meet the needs and desires of most individuals. Each year, however, more students than the Department of Residence Life can accommodate want to live on campus. Acceptance to the University does not automatically guarantee a room in a residence hall, but all freshmen who apply for accommodations in residence halls are assured of an assignment their first year, although those who submit late applications may be placed in a temporary assignment at the start of the year. The $40 housing application fee does not apply to room rental, nor is it refundable unless lack of space prevents the offer of an assignment, in which case it will be refunded upon request.

Personal property is not insured by the University, nor is the University liable for loss or damage to any article of personal property. Students are encouraged to take out personal property insurance on their belongings.

Information on personal property insurance is available at the Dean of Students' Office in 103 Barnes Hall.

Residence life refund policies are listed in the section "Terms and Conditions for Single Student Housing" of the residence hall contract.

Information concerning University housing is available from the Department of Residence Life, Cornell University, 1142 North Balch Hall, Ithaca, New York 14853-1401.

The Off-Campus Housing Office, in 103 Barnes Hall, maintains lists of accommodations that have been voluntarily submitted by local landlords. These lists are constantly changing and must be seen in the office. For more information, the booklet Guide to Off-Campus Housing may be obtained from the above office.

Dining Services
Cornell Dining provides diverse food-service programs for the entire Cornell community.

Co-op Dining
Co-op Dining is a completely voluntary dining plan serving more than half Cornell's undergraduates as well as many graduate students and other qualified members of the Cornell community. Any student may join.

Co-op Dining offers twelve flexible meal-plan options. These options provide a variety of time and meal periods on a five-or seven-day basis. Members are not penalized for switching meal plans to better meet their individual academic routines. Maximum flexibility is included with a two-meal-a-day plan that offers a choice of breakfast or lunch, and dinner daily. Co-op members may also purchase prepaid points to supplement their chosen meal-plan options.

Members eat in convenient dining rooms, located in the residential areas or on the central campus, and are free to select the dining rooms of their choice for each meal. All dining rooms serve a variety of entrées (including one vegetarian entrée at both lunch and dinner) each day. In addition, "steak nights" and specials highlight the Co-op Dining program. Specials may include outdoor barbecues, midnight breakfasts, ice cream sundaes, or the Cross-Country Gourmet dinner series, which has won national acclaim. Menus are posted weekly.

The cost of each meal-plan option is set at the beginning of each academic year and is automatically billed on a semester basis. Members do not pay New York State sales tax, which is 7 percent.

The Co-op program does not provide meals during University recess periods, including fall semester break, Thanksgiving, Christmas intercession, spring recess, and summer.

The Co-op Dining program is administered by Cornell Dining, 233 Day Hall (telephone: 255-8581). Each year, all new and transfer students receive a program description and contract. All terms and conditions of the Co-op Dining program are given in the contract, which all prospective members should read carefully before completing and mailing the application.

Other Dining Services
Dining at Cornell is not limited to the Co-op Dining program. Students who do not choose to join a dining program, including faculty and staff members, and visitors may choose from a variety of dining rooms on campus. Each dining room has its own atmosphere and menu. Most dining units serve cafeteria-style meals.

Cash-a-la-carte service is available at five Cornell Dining locations seven days a week, throughout each day. The two newest dining options are the Red Bear Cafe and Martha's. All cash dining units accept cash, CornellCard, MasterCard, and Visa cards. Dining service at each unit follows the posted hours of operation but may be limited during the summer session and University recesses such as Thanksgiving, Christmas, intercession, and spring break.

Entrepot offers a variety of grocery items, beverages, magazines, and personal items. A convenient sundry shop and a campus store are also provided. Entrepot is located on the lower level of Nytes Lodge (telephone: 255-5314).

Vending operations provide food, beverage, and snack items in many campus buildings (telephone: 255-5385).

Catering
Cornell Catering serves the entire Cornell community, either in its private dining rooms, located on the third floor of Robert Purcell Union, or at functions held in many campus locations. Cornell Catering offers food service for a variety of occasions or needs (telephone: 255-5555).

Kosher Dining
Kosher meals are offered under the auspices of Young Israel of Cornell. Meals are served seven days a week under a wide variety of meal-plan options. Further information is available by writing to the Steward, Young Israel of Cornell, 106 West Avenue, Ithaca, New York 14850.

University Health Services
The University Health Services provides comprehensive medical care for all full-time undergraduate and graduate students enrolled at Cornell University in Ithaca. Gannett Health Center, located at 10 Central Avenue, adjacent to Willard Straight Hall, is open twenty-four hours a day during the school year and is available for overnight care and emergency outpatient service outside of normal working hours. Normal hours are Monday through Friday from 8:30 to 11:30 a.m. and from 1:30 to 4:30 p.m., and Saturday from 8:30 a.m. to 12:30 p.m.

The center's medical staff, under the supervision of the medical director, consists of attending physicians and health associates from the University staff, and consulting physicians and surgeons from the Ithaca area. All medical records are strictly confidential.

For a medical appointment, a student should call 255-4082 or go to the center. For an appointment at the Psychological Service, a student should call 255-5208 or go to the offices at the center. A doctor is available for emergencies twenty-four hours a day (telephone: 255-5155).

The following services are usually offered on-site:

1) unlimited visits to Gannett Health Center
2) overnight care
3) routine diagnostic and X-ray examinations as ordered by Health Services clinicians and performed by Health Services staff
4) physical therapy services
5) counseling services at the center and in the Psychological Service
6) allergy injections
7) immunizations, vaccinations, and inoculations for travel abroad
8) contraceptive care
9) health education
10) orthopedic care
11) physical examinations

Generally, the University Health Services' clinicians will coordinate off-site care. Referrals for specialty care may be made to private physicians or private health-care facilities for hospitalization, consultation, surgical procedures, eye examinations for glasses, or prenatal or obstetrical care.

There are fees for some of the services provided on-site and all of the services provided off-site. The student is also responsible for expenses connected with illness or injury occurring (a) outside of Ithaca while in transit to and from campus, on weekends, and on vacations away from Ithaca during the academic year and (b) during the summer, unless the student is enrolled as a summer student.

To cover many of the services not provided free of charge by University Health Services, all full-time registered students and students studying in absentia are automatically enrolled in an accident and sickness insurance plan, written by a private insurance company, that includes a $50,000 major-medical provision. The plan covers hospital care, charges for surgical procedures, consultations with a private physician or specialist if referred by a Health Services physician, expenses connected with illness or injury outside of Ithaca, and limited reimbursement for allergy injections, prescription drugs, and most outpatient visits.
services. Preexisting conditions are not covered. The extent of the reimbursement is controlled by the provisions of the insurance policy. Students are covered by this plan for the entire twelve months. Only by returning a yearly waiver form, which is mailed with the first bursar's bill or available at Gannett Health Center, the bursar's office at 260 Day Hall, and at University registration, will students not be covered and not charged for this plan. The cost of this plan for 1986-87 will be approximately $215 for the entire twelve months, and the charge will appear on each student's fall tuition bill. Unless students have other health insurance to supplement medical services provided by the University Health Services, they are strongly urged to take advantage of this plan. After the waiver process has been completed, a student may be reinstated if the parents' insurance plan drops the student at a certain age or if the student's marital status changes. Application must be made within thirty days of discontinuation of other coverage.

Students who are enrolled in the accident and sickness insurance plan may also enroll their spouses and children for an annual premium. Information concerning this insurance may be obtained at Gannett Health Center or by telephoning 255-6363.

Students' spouses are eligible for benefits identical to those of the student-health-care program on a prepaid or fee-for-service basis. These services are not to be combined with the accident and sickness insurance plan. Information and forms for the spouse program may be obtained by writing or visiting the University Health Services, Gannett Health Center, Cornell University, 10 Central Avenue, Ithaca, New York 14853-3101.

Cornell United Religious Work

Cornell United Religious Work (CURW) coordinates religious affairs at Cornell. Participants in CURW may be involved in denominational, interreligious, or nondenominational activities. The denominational programs include daily or weekly opportunities for worship, study, and interaction. CURW member groups share in support and leadership of interreligious programs such as the Sage Chapel services, VIVAS (Cornell-Ithaca Volunteers in Training and Service), noncredit courses, lectures, conferences, and involvement in varied services to the University community. A diverse staff of pastoral counselors and advisers, available day or night for consultation, may be reached through the office, 118 Anabel Taylor Hall (telephone: 255-4214). This office also has information concerning weekly services in Sage Chapel and worship opportunities in the local churches and synagogue. Anabel Taylor Hall houses the Commons, a coffeehouse providing a place for informal communication between faculty staff, and students. Closely associated with CURW but independent of it, is the Center for Religion, Ethics, and Social Policy (CRESP), the nondenominational research and action component of religious affairs at Cornell.

Campus Government

The system of campus government at Cornell consists of four deliberative bodies representing not only the University population as a whole but also its major subdivisions. The system recognizes both the diversity and the unity so basic to the life of an academic community. The University Assembly focuses on matters concerning the entire campus in common, including such day-to-day essentials as transportation, campus store, and health services. Its delegates are drawn from the Student Assembly, the Employee Assembly, and the Faculty Council of Representatives. Each of these groups also has its own separate deliberative body.

The four assemblies together provide a variety of settings in which issues can be effectively discussed and policies considered by those people most directly affected. The Student Assembly consists of twenty-three students elected by the student population, all of whom are voting members, and has legislative authority over the policies of the departments of Dining, Residence Life, Unions and Activities, and the Dean of Students' Office. It also has authority to review the budgets and actions of these departments. The Employee Assembly is composed of members elected by and representing the exempt and nonexempt employees. It has the authority to examine all University policies affecting the employment environment, including such matters as education and training opportunities, recreation, and special employee needs in the areas of transportation and health services. The Faculty Council of Representatives is the legislative assembly of the University Faculty, which exercises the faculty's responsibility to regulate academic matters (including the calendar) that affect more than one college, school, or other academic division of the University.

Further information may be obtained in the Office of the Assemblies, 165 Day Hall.

Ombudsman

The Office of the University Ombudsman, 116 Stimson Hall, assists all members of the Cornell community seeking solutions to a range of problems. The major purpose of the office is the just and equitable resolution of conflicts in the University. The office is independent of the University bureaucracy and all other groups or officials on campus. That independence, combined with impartiality, immediate access to information, and total confidentiality, enables the office to deal with a wide variety of problems, separate from any factions within the University. The office provides information on University policies and practices, finds proper authorities to resolve a situation, or otherwise seek a resolution to a problem. The office will make requests for reconsideration or changes in decisions and will advocate an equitable solution when a complaint has merit. The office may also investigate problems on its own initiative and report its findings and recommendations to appropriate people in the University.

Judicial System

The judicial administrator's office receives and investigates complaints brought by students, other members of the University, and offices on campus involving alleged violations of the Campus Code of Conduct or the Statement of Student Rights. The judicial administrator may also initiate investigations. If there is reasonable cause to believe that a violation has occurred, the judicial administrator files charges and reminds the defendant of the services of the judicial advisor. Personal details of complaints and judicial actions are considered private information.

Many judicial cases are resolved by summary decision. In such decisions, the judicial administrator proposes a penalty or a remedy, or both, that the parties to the case choose to accept. Either the defendant or the judicial administrator may decide to take the case to a formal hearing instead. A complainant who is dissatisfied with the judicial administrator's action in a complaint may appeal that action to the University Hearing Board, which then decides whether or not to refer the case to an adjudicatory hearing.

Questions about the judicial system should be directed to the Office of the Judicial Administrator, 431 Day Hall (255-4680); hours are 9:00 a.m.-4:30 p.m. Monday through Thursday and 9:00 a.m.-4:00 p.m. Friday. The Policy Notebook for Students, Faculty and Staff, available from the Dean of Students' Office, details the principles and policies governing campus conduct.

A judicial advisor is available, without charge, to provide legal counseling and legal assistance to those accused of violating University rules and regulations, including academic integrity violations. The Office of the Judicial Advisor is not associated with the Cornell Legal Aid Clinic and is not equipped to handle legal problems arising outside the University context. The Office of the Judicial Advisor is located in B12 Ives Hall (255-6492). The hours of this office change each semester and are posted on the office door, along with telephone numbers where an advisor can be reached when the office is not open. Further information about the Office of the Judicial Advisor can be obtained by calling that office.

Unions and Activities

The Department of Unions and Activities oversees the three University union buildings, which serve as campus community centers and offer a wide variety of services and facilities: Willard Straight Hall, Noyes Center, and Robert Purcell Union. A partial list of facilities includes dining areas, browsing libraries, a theater, billboard and game rooms, study lounges, meeting rooms, a pottery shop, a tailor shop, darkrooms, and a unisex hair-styling salon. Among the many special services available to students are a central ticket office; a central reservations office for campus facilities; a rental service for audiovisual equipment and phonograph records; dry-cleaning service; service desks where newspapers, magazines, and sundries are sold; an art-lending library; and a check-cashing service.

Unions and Activities programming organizations include programming and policy boards that govern each of the three union facilities, as well as the following: the Alfaifa Room, a lounge area in Warren Hall where sundries and snacks are sold; Cornell Cinema, the in-house film program; the Cornell Concert Commission, which produces popular concerts; the University Unions Program Board, which presents major lectures, touring theatrical productions, and major social events, including Mardi Gras and Springfest; Wilderness Reflections, which presents summer orientation programs for new students in an outdoor setting; and the Third World Student Programming Board, which presents events to highlight minority and ethnic issues. Many of these programs support the educational objectives of Cornell, provide opportunities for personal relationships among members of the community, and fulfill Willard Straight's objective: "the enrichment of the human contacts of student life."

Union Hours

Willard Straight Hall
7:00 a.m.-7:00 p.m., 7 days a week
Noyes Center
9:00 a.m.-12:30 a.m., Sunday; Thursday 10:00 a.m.-1:30 a.m., Friday and Saturday
(Building opens for dining earlier)
Robert Purcell Union
7:00 a.m.-2:00 a.m., Monday-Saturday
7:00 a.m.-1:00 a.m., Sunday
(Hungry Bear Diner: 10:00 p.m.-3:00 a.m. daily; 2:00-5:30 p.m., Sunday)

Fraternities and Sororities

For many students, fraternity or sorority life is an integral part of the Cornell experience. There are currently forty-eight fraternities at the University, with nearly twenty-five hundred members, or 37 percent of the male undergraduate students, as members. There are sixteen sororities, with over sixteen hundred students, or 29 percent of the female undergraduates, as members. Each chapter has its own personality and environment.
As one of the largest systems in the country, its diversity is the key to its continuing growth. Fraternities and sororities provide opportunities for friendships, leadership, and personal growth. Three student-run governing boards oversee the many programs associated with fraternities and sororities. These boards are the Interfraternity Council, the Panhellenic Council, and the Black Greek Council.

Athletics

At Cornell, athletics are designed to encourage the participation of every able and interested student in varsity sports or the extensive intramural program. Cornell supports one of the largest intercollegiate athletics programs for men and women in the country and belongs to the Ivy League. Both men and women compete in the NCAA in basketball, crew, cross-country, fencing, gymnastics, ice hockey, lacrosse, polo, rifle, sailing, soccer, swimming, tennis, and indoor and outdoor track; men in baseball, lightweight crew, lightweight football, varsity golf, squash, and wrestling; and women in field hockey and volleyball. Cornell also competes in intercollegiate skiing.

Information Services

The Information and Referral Center assists students, faculty, staff, and visitors by distributing free literature, answering questions, and giving directions. The center responds to questions over the telephone, in the mail, and on a walk-in basis. Questions to which answers are not readily available will be researched by the center staff. The center's aim is to minimize confusion and to help people avoid the necessity of contacting several offices with their questions. The center is in Day Hall near the East Avenue entrance and is open Monday through Saturday from 9:00 a.m. to 5:00 p.m. The telephone number is 607/255-6200.

Campus Tours.

Guided walking tours start from the Information and Referral Center, inside the main entrance of Day Hall, every day except Independence Day, the day preceding Thanksgiving Day through the following Sunday, and December 20 through January 1. During the January intersession and spring break it is advisable to call the center to confirm the schedule. The tours, which give a general introduction to the campus, leave at the times listed below:

- April 1 – October 31: 11:15 a.m. and 1:30 p.m.
- November 1 – March 31: 11:15 a.m., 1:30 p.m., and 3:45 p.m.
- Saturday: 11:15 a.m. and 1:30 p.m.
- Sunday: 1:00 p.m.

Transportation Services

Traffic and Parking

To provide a safe walking environment for pedestrians on campus and to reduce the impact of motor vehicles on the limited campus parking facilities, Cornell has restricted vehicle access to the central campus. Cornell University encourages ride sharing and the use of alternative modes of transportation such as public transit, bicycling, and walking.

All on-campus parking (except in certain metered and time-zone areas) is by permit only and is subject to posted restrictions; vehicular access to the interior campus is restricted Monday through Friday from 7:30 a.m. to 5:00 p.m. Special parking restrictions are posted where applicable. Parking regulations are in effect throughout the year.

New York State motor vehicle and traffic laws are enforced on the Cornell campus.

All members of the campus community (students, faculty, staff, and employees of non-University agencies located on Union public property) are required to register annually with the Traffic Bureau any motor vehicles (including motorcycles) in their possession which may at any time be parked on Cornell property. This registration information is needed to enable the owner or operator to be rapidly identified and contacted if necessary; for example, if a parked vehicle is involved in an accident, must be moved immediately, or has been left with its lights on. There is no charge for vehicle registration; however, a registration sticker is not in itself a parking permit.

Information on traffic and parking regulations, and parking permits, is available at the traffic and information booths on campus and at the Traffic Bureau on Maple Avenue. The bureau will be glad to assist any individual with general inquiries or special problems and requests (telephone: 255-4600).

Bus Service

The Cornell campus is served by a number of public transit routes during the day and evening. CU Transit, Inc., provides on-campus service as well as commuter services to outlying communities. Several community bus routes connect the University with other surrounding residential and commercial areas.

Information about CU Transit and other transit services may be obtained by calling the Office of Transportation Services at 255-5688 or CU Transit at 255-3782. Schedules for on-campus and off-campus service are posted in bus-stop shelters and are available from the Traffic Bureau, the Information and Referral Center in the Day Hall lobby, Robert Purcell Union, and the Willard Straight Hall information desk.

Public Safety Services

Emergencies

Accidents, crimes, fires, and all other emergencies on campus should be reported immediately to the Department of Public Safety (telephone: 255-1111). The Department of Public Safety is located in G2 Barton Hall and is open twenty-four hours a day. Public telephones to report emergencies, seek information, or report suspicious activity are located throughout the campus and can be readily recognized by blue lights above them.

Lost and Found

The central Lost and Found Office, operated by the Department of Public Safety, is located in G18 Barton Hall and is open from 9:00 a.m. to 4:00 p.m. Monday through Friday (telephone: 255-1977). Lost articles are usually turned into the information desks in Day Hall and Willard Straight Hall and other central offices, but all such items are eventually turned over to this central lost and found.

Auxiliary Patrol Services Section

The Auxiliary Patrol Services Section is responsible for scheduling and staffing extra-University functions that require public safety personnel for traffic direction or crowd control. The manager may be contacted at 255-8948.

Crime Prevention Section

The Crime Prevention Section provides lectures and orientation to various University groups on topics ranging from general public safety services to drug abuse, crime prevention, and rape and assault prevention. Persons interested in these free programs should contact the manager of the Crime Prevention Section at 255-7404.

University Registration

University registration is the process by which the University registrar and colleges certify the eligibility of students to enroll in courses and purchase or use a variety of services available at the University, such as CornellCard, Co-op Dining, libraries, special bus passes, and housing. University registration includes the issue or validation of the student identification card and the collection of information needed for the student directory and state and federal reports. University registration is held on the dates stated in the University calendar at a time and place announced well in advance of the beginning of each semester.

Required Immunization

Before registration at the University all students must be prepared to present proof of adequate immunization against diphtheria, tetanus, rubella, measles, and poliomyelitis.

Late Registration

The final date for late registration coincides with the last day for adding courses. Late registrants are assessed a late processing charge. Requests to waive the charge will be acted on favorably only for reasons of academic involvement.

The University does not permit after-the-fact registration in which persons attend classes and pass courses before seeking to register and receive official course credit.

The University reserves the right to require unauthorized unregistered persons who attend classes or in other ways seek to exercise student privileges to leave the University premises. The University registrar will notify the appropriate college or school about such cases and ask that office to contact the person concerned.

Late Registration Fee

<table>
<thead>
<tr>
<th>Late Period</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1–3 weeks</td>
<td>$75</td>
</tr>
<tr>
<td>4 weeks</td>
<td>$85</td>
</tr>
<tr>
<td>5 weeks</td>
<td>$95</td>
</tr>
<tr>
<td>6 weeks</td>
<td>$105</td>
</tr>
<tr>
<td>After 6 weeks, each additional week</td>
<td>$25</td>
</tr>
</tbody>
</table>

Course Enrollment

Course enrollment for each semester at Cornell takes place partway through the preceding semester. Dates are announced in advance and are usually posted in the school and college offices. Course enrollment generally runs for two weeks. Each college or school notifies students about special procedures. Students are often expected to meet with their advisers during this two-week period to check that the courses they plan to take will ensure satisfactory progress toward a degree. Students complete an optical-mark course enrollment form, then return the form to their college office. Each student is sent a Course Confirmation Statement listing the courses processed from the enrollment form. Class schedules are distributed later by the college offices, often during the same days as University registration.

New students and transfer students are sent course enrollment instructions by their college offices before they arrive on campus. Procedures vary from college to college.
Course Add/Drop/Change Period

Students may adjust their schedules during add/drop/change periods. The length of the periods varies according to colleges. An optical-mark form is completed by the student and signed by both the student's adviser and an appropriate representative of the department offering the course (an instructor, department staff member, or college registrar, depending on the college). The completed and signed form must be returned to the student's college office to be processed. See the chart below for the course add/drop/change fee.

Late Course Enrollment and Late Add/Drop/Change Fees

<table>
<thead>
<tr>
<th>Academic Unit</th>
<th>Late Course Enrollment Fee</th>
<th>Late Course Add/Drop/Change Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>College of Agriculture and Life Sciences</td>
<td>No fee</td>
<td>No fee</td>
</tr>
<tr>
<td>College of Architecture, Art, and Planning</td>
<td>$10</td>
<td>$10*</td>
</tr>
<tr>
<td>College of Arts and Sciences</td>
<td>$10*</td>
<td>$10*</td>
</tr>
<tr>
<td>College of Engineering</td>
<td>$10</td>
<td>$10</td>
</tr>
<tr>
<td>Graduate School</td>
<td>$10</td>
<td>$10</td>
</tr>
<tr>
<td>School of Hotel Administration</td>
<td>No fee</td>
<td>No fee</td>
</tr>
<tr>
<td>College of Human Ecology</td>
<td>$10*</td>
<td>$10*</td>
</tr>
<tr>
<td>School of Industrial and Labor Relations</td>
<td>No fee</td>
<td>No fee</td>
</tr>
<tr>
<td>Johnson Graduate School of Management</td>
<td>$10</td>
<td>$10</td>
</tr>
<tr>
<td>Summer Session and Extramural Courses</td>
<td>†</td>
<td>†</td>
</tr>
<tr>
<td>Division of Unclassified Students</td>
<td>$10</td>
<td>$10</td>
</tr>
<tr>
<td>Veterinary Medicine</td>
<td>No fee</td>
<td>No fee</td>
</tr>
</tbody>
</table>

*Consult the college office for special considerations and requirements.
†Consult the Summer Session Announcement and the Division of Extramural Study brochure for fees.

Class Schedules and Attendance

Class Attendance and Absences

Students are expected to be present throughout each term at all meetings of courses for which they are registered.

The right to excuse a student from class rests at all times with the faculty member in charge of that class.

All lectures, recitations, and similar exercises start at 8:00 a.m., 9:05 a.m., 10:10 a.m., 11:15 a.m., 12:20 p.m., 1:25 p.m., 2:30 p.m., or 3:35 p.m. and last fifty minutes, except that on Tuesday and Thursday the first and second, the third and fourth, the fifth and sixth, and the seventh and eighth periods may be combined to allow for longer meeting times.

All laboratories and similar exercises that continue for 1 hour and 55 minutes, 2 hours and 25 minutes, or 3 hours are scheduled as shown below.

Schedule for Classes Longer than Fifty Minutes

<table>
<thead>
<tr>
<th>Time</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>6:00 a.m.</td>
<td>1 hour and 55 minutes</td>
</tr>
<tr>
<td>7:30 a.m.</td>
<td>2 hours and 25 minutes</td>
</tr>
<tr>
<td>10:10 a.m.</td>
<td>3 hours</td>
</tr>
<tr>
<td>1:25 p.m.</td>
<td>4 hours and 25 minutes</td>
</tr>
<tr>
<td>4:25 p.m.</td>
<td>5 hours</td>
</tr>
<tr>
<td>10:10 p.m.</td>
<td>6 hours</td>
</tr>
<tr>
<td>12:35 p.m.</td>
<td>7 hours</td>
</tr>
<tr>
<td>7:30 p.m.</td>
<td>8 hours</td>
</tr>
<tr>
<td>10:30 p.m.</td>
<td>9 hours</td>
</tr>
<tr>
<td>12:35 a.m.</td>
<td>10 hours</td>
</tr>
</tbody>
</table>

Final Examinations

Final examinations for undergraduate courses are scheduled by the Office of the University registrar. Examinations may be one, two, or two and one-half hours in length at the discretion of the department concerned.

Auditing Courses

Summer school and extramural students may officially register as visitors (auditors) in courses and have this entered on their permanent records if their attendance is reported as satisfactory. Graduate students may register for courses as auditors but will not have the courses listed on their transcripts. Undergraduates may not register to audit courses.

Leaves and Withdrawals

A leave of absence must be requested from the college in which the student is enrolled. A leave of absence is granted for a specified time, after which the student is expected to return to resume course work. The student should inform the college of enrollment of his or her intent to return.

A student may withdraw from the University at the student's discretion. However, a college may withdraw a student who fails to return at the end of a period of authorized leave.

Medical leaves are granted and processed through University Health Services.

Internal Transfers

Transfer from one undergraduate unit to another is not guaranteed. A student in good standing may apply to transfer from one college to another within the University. It is necessary for an internal transfer to inform the admitting college of the acceptance of admission within seven days of the offer of admission. Students interested in transfer within the University should consult with the appropriate school or college office.

Privacy of Records

According to federal law, grades are restricted information and may be released only to the student or at the student's written request. Thus grades earned on examinations or in courses may not be posted by name. Posting by student ID number is, however, permissible. Although there is no federal or state legislation that pertains to the manner in which graded work is to be returned to students, the returning of such materials should be handled in such a manner as will preserve the student's privacy.

Course Numbering System

The course levels have been assigned as follows:

- 100-Level Course—introductory course, no prerequisites, open to all qualified students
- 200-Level Course—lower-division course, open to freshmen and sophomores, may have prerequisites
300-Level Course—upper-division course, open to juniors and seniors, prerequisites

400-Level Course—upper-division course, open to seniors and graduate students, 200- and 300-level course prerequisites or equivalent

500-Level Course—professional level (e.g., Management, Law, Veterinary Medicine)

600-Level Course—graduate-level course, open to upper-division students

700-Level Course—graduate-level course

800-Level Course—master’s level, thesis, research

900-Level Course—doctoral level, thesis, research

Arts and Sciences

The list of courses that follows is arranged in two broad groups.

**Group 1:** Divisions that offer both undergraduate- and graduate-level courses

- Agriculture and Life Sciences
- Architecture, Art, and Planning
- Arts and Sciences
- Biological Sciences
- Engineering
- Hotel Administration
- Human Ecology
- Industrial and Labor Relations
- Nutritional Sciences
- Officer Education

**Group 2:** Graduate professional divisions

- Law
- Management
- Veterinary Medicine

There are no courses offered by the Graduate School as a unit; graduate-level courses are contained in the various departments that offer the instruction.

Within each division, courses are generally arranged in alphabetical order by department and in numerical order within the departments. All courses, 0-999, are briefly described for those divisions (group 1) offering instruction to both undergraduate and graduate students. Courses in the graduate professional divisions (group 2) are designated by number and title only.

It is not possible to keep this single-volume course list completely up-to-date. The most current information regarding course schedules, sections, rooms, credits, and registration procedures may be found in the Course and Time Roster and the Course and Room Roster, each issued twice a year by the Office of the University Registrar. Students are also advised to consult the individual college and department offices for up-to-date course information.

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**Grading Guidelines**

The official University grading system uses letter grades with pluses and minuses. Passing grades range from A+ to D-. F is failing. INC denote incomplete, and R is the grade given at the end of the first semester of a year-long course. The grades of INC and R do not have quality-point equivalents. These are the quality-point equivalents:

- A+ = 4.3
- A = 4.0
- B+ = 3.3
- B = 3.0
- C+ = 2.3
- C = 2.0
- D+ = 1.3
- D = 1.0
- A− = 3.7
- B− = 2.7
- C− = 1.7
- D− = 0.7
- F = 0.0

This is how a term average is computed:

### Course Grade Points Credits Product

<table>
<thead>
<tr>
<th>Course</th>
<th>Grade</th>
<th>Points</th>
<th>Credits</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry 103</td>
<td>B+</td>
<td>3.3</td>
<td>3</td>
<td>9.9</td>
</tr>
<tr>
<td>English 151</td>
<td>C−</td>
<td>1.7</td>
<td>3</td>
<td>5.1</td>
</tr>
<tr>
<td>DEA 145</td>
<td>B</td>
<td>3.0</td>
<td>4</td>
<td>12.0</td>
</tr>
<tr>
<td>CEH 100</td>
<td>B</td>
<td>3.0</td>
<td>3</td>
<td>9.0</td>
</tr>
<tr>
<td>DEA 111</td>
<td>C</td>
<td>2.0</td>
<td>3</td>
<td>6.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>16</td>
<td></td>
<td>42.0</td>
</tr>
</tbody>
</table>

To arrive at the term average, add the products (credits × quality points) and divide by the number of credits taken. Here, 42 divided by 16 equals 2.63.

The cumulative average (an average of grades from two or more terms) equals the sum of the products of all the grades at Cornell divided by the total number of credits taken.

### Incomplete

The symbol of Incomplete is only appropriate when two basic conditions are met:

1) the student has a substantial equity at a passing level in the course with respect to work completed; and

2) the student has been prevented by circumstances beyond the student's control, such as illness or family emergency, from completing all of the course requirements on time.

An Incomplete may not be given merely because a student fails to complete all course requirements on time. It is not an option that may be elected at the student's own discretion.

While it is the student's responsibility to initiate a request for an Incomplete, reasons for requesting an Incomplete must be acceptable to the instructor, who establishes specific make-up requirements. The instructor has the option of setting a shorter time limit than that allowed by the student's college for completing the course work. Several colleges require that a statement signed by the instructor be on file indicating the reason for the Incomplete and the restriction, if any.

It is the responsibility of the student to see that all Incompletes are made up within the deadline and that the grade has been properly recorded with the student's college registrar.

### Changes in Grades

Changes in a grade may be made only if the instructor made an error in assigning the original grade.

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**Official Transcripts**

An official transcript is one that bears the official seal of the University and the signature of the University registrar, sent in a sealed envelope directly from the Office of the University Registrar to another institution or agency as directed by the student. Transcripts can be obtained through the Office of the University Registrar, 222 Day Hall.
University Requirements for Graduation

For degree requirements such as residency, number of credits, distribution of credits, and grade averages, see the individual requirements listed by each college or school or contact the college offices.

Physical Education

All undergraduate students must complete two terms of work in physical education unless exempted from this requirement for medical or special reasons or by virtue of advanced standing upon admission. For transfer students, the requirement is reduced by the number of terms satisfactorily completed, not necessarily including physical education, in a college of recognized standing before entering Cornell. Credit in physical education may be earned by participation in courses offered by the Department of Physical Education and Athletics, participation on an intercollegiate athletic team as a competitor or manager, performing in the marching band, or participating in an athletic club or organization recognized by the director of physical education as fulfilling the physical education requirement. Physical education is a requirement of the first two terms at Cornell. Students must register for it in each term, except those in which postponements are granted, until the requirement is satisfied.

Temporary postponements may be granted on the basis of physical disability, schedule conflicts, or excessive work load (employment exceeding twenty hours a week). The Gannett Health Center can provide certifications based on health, and the Financial Aid Office can provide certifications of employment. Students should see the Department of Physical Education and Athletics or their college office to establish postponements or waiver of the requirement. Questionable or unusual cases may be resolved by petition to the Faculty Committee on Physical Education.

Swim test. All new students who do not pass a basic seventy-five-yard swim test are required to include swimming in their program of physical education unless they are excused by Gannett Health Center. All nonswimmers are required to register in beginning swim classes.

Student Responsibilities

In extracurricular affairs and conduct, Cornell students have today, as they had in the University’s infancy, maximum freedom to govern themselves and responsibility for the use they make of this freedom. The student, both as an individual and as a member of any student organization, however, is responsible for adhering to all applicable regulations set forth in the Policy Notebook for Students, Faculty and Staff. Copies of this booklet are available in the Dean of Students’ Office. In addition to the Campus Code of Conduct, the Policy Notebook contains a Statement of Student Rights, a Code of Academic Integrity, the University policy on access to and release of student records, and information on the University judicial system, library and motor vehicle regulations, and other policies and regulations.

Students are responsible for meeting all requirements for the courses in which they are enrolled, as laid down by the faculty members teaching the courses. It is also the student’s responsibility to be aware of the specific major, degree, distribution, college, and graduation requirements for completing his or her chosen program of studies. Students should know how far they have progressed in meeting those requirements at every stage of their academic career.

Student Records

The University policy on access to and release of student records conforms to the Family Educational Rights and Privacy Act of 1974. See the Policy Notebook for Students, Faculty and Staff for details of University policy.

Bursar Information

Tuition, Fees, and Expenses

Tuition for Academic Year 1986–87

Endowed Divisions

Undergraduate

Architecture, Art, and Planning

Arts and Sciences

Engineering

Hotel Administration

Unclassified division

Graduate

Graduate School (with major chairman in an endowed division)

Professional

Law School

Management

Statutory Divisions

Undergraduate

Agriculture and Life Sciences

Human Ecology

Industrial and Labor Relations

New York resident*

Nonresident*

Graduate

Graduate School (with major chairman in agriculture, human ecology, or industrial and labor relations)

Graduate School—veterinary medicine

Professional

Veterinary medicine

New York resident*

Nonresident*

Summer Session (1986)

Per credit

Extramural Division

Per credit

Other Tuition and Fees

In absentia fees

Graduate

Undergraduate

Law and Management

Excess hours tuition rate for students in statutory units taking extra endowed credits

Per credit hour

The amount, time, and manner of payment of tuition fees, or other charges may be changed at any time without notice.

Residency status is determined at the time of admission by the college. Change in residency status is determined by the bursar.

Fees and Expenses

Undergraduate applicants to Cornell pay a non-refundable $45 application fee when submitting an application for admission. The graduate application fee is $35.
Acceptance Deposit

An acceptance deposit of $200 is required of all entering undergraduate students. If a student does not enter in the semester for which the deposit is paid, or does not formally withdraw before July 1 for the fall semester or December 1 for the spring semester, or does not complete at least one semester at the University, the deposit is forfeited. The acceptance deposit will not be credited to the students' bursar accounts in their entering semester and cannot be used against semester charges. The deposit will be refunded after the student's final semester at Cornell.

Tuition Refund Policy

Amounts personally paid for tuition may be refunded if the student requests a leave of absence or withdrawal from the office of the dean of his or her college of enrollment. The date of this request will determine the tuition liability for the semester. Students who terminate their registration with the University during a fall or spring semester in this manner will be charged tuition from the University registration day through the date of their request as follows: first six days of the semester (including University registration day), no charge; seventh day of the semester, 10 percent; second week, 20 percent; third week, 30 percent; fourth week, 40 percent; fifth week, 60 percent; sixth week, 80 percent; seventh week to the end of the semester, 100 percent.

Repayment policy. Students receiving financial aid from the University who withdraw during a term will have their aid reevaluated, possibly necessitating repayment of a portion of aid received. Repayment to aid accounts depends on the type of aid received, government regulations, and the period of time in attendance. A partial semester will generally count as one of the eight semesters of financial aid eligibility normally allowed a student.

Billing and Payment

Billing

Tuition will be billed in July and December and must be paid prior to registration. All other charges, credits, and payments will appear on monthly statements mailed before the tenth of every month. It is possible that some charges will not be listed on the first bill and will appear on a subsequent monthly bill. A student must be prepared to pay any charges appearing on a subsequent bill even though the student receives a financial aid stipend before the billing charges are billed.

All bills are due by the date stated on the bill; all payments must be received by that date to avoid finance charges. Payments are not processed by postmark.

Please inform the Office of the Bursar of any change in billing address. Address changes made at other offices will not change the billing address. The address initially used on billing statements will be the home address as listed on each student's application for admission.

Payments

An individual who has outstanding indebtedness to the University will not be allowed to register or reregister in the University, receive a transcript of record, have academic credits certified, be granted a leave of absence, or have a degree conferred. If students' bills show a previous unpaid balance, they must arrange for payment by August 13 if they plan to register for the fall semester. University policy precludes the use of any current financial aid for payment of past-due charges.

The Office of the Bursar acts as a clearinghouse for student charges and credits that are placed directly on a student's bill by several departments and offices of the University. Since the Office of the Bursar does not have detailed records concerning many items that appear on a bill, students should contact the office involved if they have questions.

For further information, students should contact the Office of the Bursar, Cornell University, 260 Day Hall, Ithaca, New York 14853-2801. (Telephone: 607/255-2336).

Cornell Installment Plan (CIP)

Cornell offers to all students a monthly installment plan for payment of University expenses. Information about this plan is mailed to parents of continuing students in April of each year and to parents of incoming freshmen and transfers in May of each year.

Multiple-Year Tuition Prepayment Plan

This plan is available to the parents of students who are not financial aid recipients. Two, three, or four years' tuition may be paid at the tuition rate in effect for the next full school year. Future tuition increases do not affect participants for the duration of their prepayment plan. For further information, interested persons should contact the Office of the Bursar, Cornell University, 260 Day Hall, Ithaca, New York 14853-2801. (Telephone: 607/255-2336).

Tuition Refund Insurance

To provide a more comprehensive refund program, Cornell makes available the Tuition Refund Plan. This plan provides refunds of tuition in the event of absence or withdrawal for medical or emotional reasons.

Students should contact the Office of the Bursar for further information.

Cornellcard

Cornellcard is a University charge card that can be used for making purchases on campus. Any registered, full-time, matriculated student may apply for a Cornellcard by filling out an agreement form. A $5 annual nonrefundable fee is assessed the first time a charge is made. The replacement fee for a lost card is $15. Itemized monthly statements, which are mailed to students, must be paid by the due date on the statement, or finance charges of 1 1/4 percent per month (15 percent annual rate) will be assessed. All accounts must be paid in full before each registration period.

Accounts with unpaid balances at the close of a semester (other than for the current monthly charges) may not be renewed, and University registration will not be permitted, nor transcripts issued or degrees conferred, until the past-due balance has been paid. The Cornellcard is nontransferable. Loss, theft, or possible unauthorized use should be reported immediately to the Cornellcard Office, 260 Day Hall (telephone: 607/255-6324). The maximum permissible account balance at any one time is $400. Credit privileges will be suspended without notice on any account in excess of the credit ceiling. A brochure is available on request from the Office of the Bursar.

Bad-Check Policy

Any check not honored by a bank will be charged to a student's bursar account along with a fine for the returned check according to the following schedule:

<table>
<thead>
<tr>
<th>Returned Check Amount</th>
<th>Fine</th>
</tr>
</thead>
<tbody>
<tr>
<td>up to $50</td>
<td>$10</td>
</tr>
<tr>
<td>$50.01-$200</td>
<td>15</td>
</tr>
<tr>
<td>over $200</td>
<td>25</td>
</tr>
</tbody>
</table>

These charges will be subject to a finance charge at the rate of 1 1/4 percent per month (15 percent annual rate).

Check-cashing privileges will be suspended for at least one semester for anyone who writes two or more bad checks during the semester. In addition, Cornellcard charging privileges will be suspended. Students who issue four bad checks are subject to disciplinary action through the University judicial system and will have their check-cashing privileges permanently suspended along with Cornellcard charging privileges.

Money Management

Some students have difficulty managing their resources to meet expenses. Students should plan for their expenses carefully, using the cost-of-attendance figures in the brochure Financial Aid Information, 1986-87 as a guide. Brochures are also available describing housing on and off campus and dining plans.

The consequences of not paying University bills are severe. A student may not register for a new term until all charges are paid for preceding terms.

Degrees will not be conferred and transcripts will not be sent until all University charges, including Cornellcard, are paid.
Programs of Financial Assistance

Cornell University offers a variety of scholarships, grants, employment opportunities and loans to students who demonstrate financial need. Since requirements and application procedures may differ among programs, students are encouraged to contact the appropriate office for specific information. Application deadlines, program information, and job listings are available through CUINFO, the University's computerized information system. In addition, financial aid and student employment issues are discussed in regular newsletters distributed by the Office of Financial Aid and Student Employment.

For information concerning financial aid programs, consult the following offices:

- **Graduate School of Management**: Office of Admissions and Student Affairs, Cornell University, 315 Malott Hall, Ithaca, New York 14853-2801 (607/255-5243).
- **Graduate School of Management**: Management, School of Business Administration, Ithaca, New York 14853-4201 (607/255-2484).
- **College of Veterinary Medicine**: Cornell University, 110 Sage Graduate Center, Ithaca, New York 14853-6201 (607/255-4884).
- **Eligibility**

To be eligible for assistance a student must be enrolled full-time in a degree program at Cornell or be eligible to register in a college or division, and not owe a refund from any grant or loan or be in default on any loan received to attend Cornell. Students on leaves of absence and undergraduates registered in absenctia are not eligible to receive Cornell assistance.

New students and continuing-aid recipients who have met application deadlines have top priority for receiving undergraduate aid. Continuing undergraduates applying for aid for the first time are considered on the basis of remaining funds.

To determine eligibility for the need-based assistance at the undergraduate level the University follows closely, but does not strictly adhere to, the need analysis procedures established by the College Scholarship Service. In addition, the composition of the financial aid package (proportion of self-help/scholarship) is influenced by the ratings of the college or school admissions selection committees. Financial aid packages will not change because of less-than-expected academic performance for at least two years from the date of the initial award. However, as in the past, aid packages may vary in subsequent years on the basis of changes in family financial circumstances, increased costs, and the availability of federal funds.

- **Application**

Applications for undergraduates for the 1987-88 academic year will be available from the Office of Financial Aid in December 1986. Undergraduates are required to reapply for financial aid annually and must submit applications by April 1, 1987.

- **State Aid**

State loan proceeds are usually disbursed by a check made payable jointly to the student and Cornell University. The Office of the Bursar will credit the loan amount to the student's account when the student submits the check to that office. Finance charges on state loan amounts are not waived unless Cornell is responsible for late processing of the loan application.

- **National Merit Scholarships**

Non-University Financial Aid

- **State Aid**

State loan proceeds are usually disbursed by a check made payable jointly to the student and Cornell University. The Office of the Bursar will credit the loan amount to the student's account when the student submits the check to that office. Finance charges on state loan amounts are not waived unless Cornell is responsible for late processing of the loan application.

- **National Merit Scholarships**

National Merit Scholarships are paid to the student in the form of a check from the National Merit Corporation that is sent to the Office of Financial Aid. Because Merit checks are received after tuition payments are due, the bursar annually for awards credited each semester in the amount of these scholarships. When checks are received, they are credited against outstanding tuition balances.

- **Other Financial Aid Programs**

Other aid programs are paid to students in the form of a check from Cornell. Students are encouraged to contact the Office of Financial Aid in December 1986 for the dates of the initial payments. All financial aid is supposed to be paid to the student as soon as possible. If all University charges have been paid at the time the check is deposited, a refund check will be issued to the student. These checks may be picked up in 260 Day Hall.

- **Eligibility**

To be eligible for assistance a student must be enrolled full-time in a degree program at Cornell or be eligible to register in a college or division, and not owe a refund from any grant or loan or be in default on any loan received to attend Cornell. Students on leaves of absence and undergraduates registered in absenctia are not eligible to receive Cornell assistance.

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- **National Merit Scholarships**

1. Pursuit of program: Freshmen are required to complete a minimum of 6 credits per semester, 9 credits per semester; and juniors and seniors, 12 credits per semester. Standards for graduate students are determined by each recipient's Special Committee.

2. Satisfactory academic progress: Each recipient must maintain eligibility to reregister each semester.

Any New York State resident receiving a tuition benefit administrated by Cornell is required to apply for a TAP award. (Graduate students receiving aid from Cornell for their tuition who are eligible for TAP and choose not to apply will be billed $300 per semester.)

The TAP program is administered by the Office of the Bursar, 260 Day Hall (telephone: 607/255-6414).

The Cornell Tradition

The Cornell Tradition is a unique program of financial assistance for undergraduates. The program is made possible through the generosity and support of alumni and friends of the University. It seeks to reward those undergraduate men and women who demonstrate a commitment to the work ethic by funding a portion of their education expenses.

The Cornell Tradition offers four fellowship programs and a summer job program. Fellowship programs are restricted to students receiving need-based financial aid from the University. The Summer Job Network is available to any undergraduate regardless of need.

Freshman and Transfer Fellowships. Students are nominated for fellowships during the admission process on the basis of work records, leadership, and scholarship achievements. Fellows may receive up to $2,500 to replace the recommended loan during their first year of study at Cornell.

Academic Year Fellowship. Students must apply during the spring semester. Fellows are chosen on the basis of work records, leadership, and scholarship achievements and may receive up to $2,500 to replace the recommended loan in the next year's financial aid package.

Summer Fellowship. This is available only to Cornell Tradition fellows and students placed through the Summer Job Network. Students may receive up to $1,400 to replace unmet summer savings expectations if they accepted a summer job away from their hometown. Applications are due early in the fall semester.

Summer Job Network. Students must apply by the end of the fall semester. Accepted candidates are referred to career-related summer job opportunities developed by a nationwide network of alumni volunteers.

More information regarding the Cornell Tradition can be obtained from the Student Employment Office, 203A Day Hall.

Financial Aid Services

Counseling on individual financial aid problems and questions is available from trained counselors in the Office of Financial Aid. Appointments may be made at the reception desk at the Office of Financial Aid, located in 203 Day Hall. Parents are welcome, though it is suggested that appointments be verified prior to visiting the campus. Peer advisors are also available to answer routine questions regarding application procedures and sources of aid.
Orientation Sessions

Although attendance at orientation sessions is not required, the Office of Financial Aid strongly recommends that all new undergraduate financial aid recipients and their parents attend one of the financial aid orientation sessions listed in the Cornell Orientation Program. A schedule of orientation events is available from the Dean of Students’ Office.

Student Employment Services

The Student Employment Office (SEO), at 203A Day Hall, has counselors available to assist students in locating part-time employment during the academic year and full-time employment for the summer. A variety of programs and services are administered and available through the Student Employment Office, including the College Work-Study Program, non-work-study job opportunities, the Cornell Traditions, resolution of employee-employer conflicts, information regarding the student employee job-classification and wage-scale system, and off-campus job opportunities.

Information regarding job postings, programs, and application deadlines is available through the SEO, CUIINFO, Scoop Sheet (a monthly newsletter for students who work) and “Student Employment Notes” (a column in the Cornell Daily Sun).

Statement of Student Rights and Responsibilities

1) Students have the right to be informed of, and to apply for, all financial aid programs for which they are eligible, and have the responsibility to apply by program deadlines and to acquaint themselves with the application procedure.

2) Students have the right to know how financial need and award packages will be determined and to request a review of the financial aid package should circumstances change to negatively affect the family’s ability to meet costs of attendance, and have the responsibility to notify the University should new resources become available to the student that were not originally considered.

3) Students who borrow from the University have a right to full disclosure of the terms and provisions of loan programs, including typical repayment schedules, and have the responsibility to attend preloan and exit interviews before borrowing and leaving the University. They must repay loans on a timely basis and keep the University informed of their current address.

4) Students have the right to be informed of financial aid policies and have the responsibility to be aware of all published financial aid policies and to comply with these policies.

5) Students have the responsibility to submit accurate information on all University documents relating to the financial aid application process.
New York State College of Agriculture and Life Sciences

Administration

David L. Call, dean
Kenneth E. Wing, associate dean
George J. Connerman, director of instruction
Helen L. Wardeberg, associate director of instruction
Norman R. Scott, director of research
Brian F. Chabot, associate director of research
Lucinda A. Noble, director of cooperative extension
Edwin B. Oyer, director of international agriculture

Office of Instruction Staff

Student services: Donald Burgett, Kay Cooke, Catherine Thompson
Registrar: Tom McIndoe
Admissions: Richard Church, Susan Miller, Nancy Rehkugler, Randy Stewart
Career development: William Alberta

Department Chairmen

Agricultural economics: R. J. Kalter, Warren Hall
Agricultural engineering: G. E. Rehkugler, Riley-Robb Hall
Agronomy: R. F. Lucey, Emerson Hall
Animal science: J. M. Elliot, Morrison Hall
Communication: R. D. Colle, Roberts Hall
Education: J. P. Bail, Roberts Hall
Entomology: M. J. Tauber, Comstock Hall
Floriculture and ornamental horticulture: C. F. Gortzig, Plant Science Building
Food science: R. A. Ledford, Stocking Hall
Microbiology: R. P. Mortlock, Stocking Hall
Natural resources: R. T. Oglesby, Fenow Hall
Plant breeding and biometry: W. D. Pardee, Emerson Hall
Plant pathology: W. E. Fry, Plant Science Building
Pomology: E. Oyer, Caldwell Hall
Poultry and avian sciences: R. C. Baker, Rice Hall
Rural sociology: E. C. Erickson, Warren Hall
Vegetable crops: E. E. Ewing, Plant Science Building

Facilities

The College of Agriculture and Life Sciences is located on the upper campus, up the hill from the central area of Cornell University, on land that was once part of the Ezra Cornell family farm.

Buildings around the area commonly known as the Ag Quad house classrooms, offices, and laboratories. Flanking them are the greenhouses, gardens, and research facilities. Nearby orchards, barns, field plots, forests, and streams extend as far as the Animal Science Teaching Research Center at Harford and the Agricultural Experiment Station at Geneva.

Roberts Hall serves as headquarters for the administrative units, including offices of the deans and directors of instruction, research, and cooperative extension. The offices of the director of instruction and the college registrar are in 192 Roberts Hall, the Admissions Office in 195. Information about career planning, placement, academic programs, and counseling may be obtained in 17 Roberts Hall.

Mann Library, with its extensive collections of materials in the agricultural and biological sciences, is at the east end of the Ag Quad. The student lounge and service center, known as the Altra Room, and many of the college classrooms are in Warren Hall. Public computer facilities are available in 160 Warren Hall, in 160 Riley-Robb Hall, and in Mann Library.

Degree Programs

The College of Agriculture and Life Sciences offers programs leading to the degrees of Bachelor of Science, Master of Science, and Doctor of Philosophy. Professional degrees include the Master of Professional Studies and the Master of Arts in Teaching. Some registered professional licensing and certification programs are also available.

Each curriculum in the college creditable toward a degree is registered with the New York State Education Board and is linked with the national Higher Education General Information Survey (HEGIS) codes for federal and state reporting.

Graduate Degrees

Graduate study is organized by fields that generally coincide with the academic departments but may draw faculty from several disciplines in the various colleges of the University. The following graduate fields have primary affiliation in Agriculture and Life Sciences. Current graduate field representatives are also listed.

Agriculture [M.P.S.(Agr.)], G. Connerman, Roberts Hall
Agricultural Economics, R. Boisvert, Warren Hall
Agricultural Engineering, L. Albright, Riley-Robb Hall
Agronomy, R. Wagener, Bradfield Hall
Animal Breeding, L. Van Vleck, Morrison Hall
Animal Science, R. Quaas, Morrison Hall
*Biochemistry, Molecular and Cell Biology, G. Feigenson, Clark Hall
*Biometry, S. Schwager, Warren Hall
Development Sociology, F. Young, Warren Hall
*Ecology and Evolutionary Biology, P. Marks, Conron Hall
Education [also M.A.T.], J. Millman, Roberts Hall
Entomology, C. Cupp, Comstock Hall
Environmental Toxicology, J. Fessenden-Raden, Clark Hall
Floriculture and Ornamental Horticulture, R. Langhans, Plant Science Building
Food Science and Technology, W. Jordan, Stocking Hall
*Genetics, A. Blackler, Emerson Hall
International Agricultural and Rural Development [M.P.S.(Agr.)], E. Oyer, Caldwell Hall
Landscape Architecture [M.C.A./L.A.], L. Mirin, E. Sibley Hall
Microbiology, R. Mortlock, Stocking Hall
Natural Resources: J. Kelley, Fenow Hall
*Neurobiology and Behavior, P. Sherman, Seeley Mudd Hall
Nutrition, L. Wright, Savage Hall
*Physiology, D. Tapper, Veterinary Research Tower
Plant Breeding, M. Sorrells, Bradfield Hall
Plant Pathology, S. Beer, Plant Science Building
Plant Protection [M.P.S.(Agr.)], P. Ameson, Plant Science Building
Pomology, F. Liu, Plant Science Building
Vegetable Crops, P. Ludford, Plant Science Building
* Division of Biological Sciences

Bachelor of Science Degree

Departments in the College of Agriculture and Life Sciences sponsor study for the B.S. degree in sixteen major fields. To qualify for the degree, students must fulfill requirements established by the faculty of the college and administered through the Office of Instruction. The following units offer major fields of study for undergraduates. A faculty advising coordinator is listed for each unit. Students should consult with the faculty coordinator regarding requirements and opportunities for concentrations within the major field.

Agricultural Economics: D. Goodrich, 254 Warren Hall
Agricultural Engineering: G. Rehkugler, 104 Riley-Robb Hall

Agronomy and Meteorology: G. Fick, 505 Bradfield Hall
Animal Sciences: J. Poljak, 8-22 Morrison Hall
Biological Sciences, Division of: H. Stinson, 200 Stimson Hall
Communication: B. Earle, 307 Roberts Hall
Development Sociology: E. Erickson, 133 Warren Hall
Entomology: G. Wheeler, Comstock Hall
Food Science: J. Sherbon, 207 Stocking Hall
Landscape Architecture: P. Trowbridge, 230 E. Roberts Hall
Microbiology: P. VanDemark, 413 Stocking Hall
Natural Resources: H. Brument, 206 E. Fennow Hall
Plant Science Units (Plant Biology, Breeding, Pathology/Protection, Floriculture, Pomology, Vegetable Crops): J. Lorbe, 424 Plant Science Building

Rural Sociology: E. Erickson, 133 Warren Hall
Statistics and Biometry: C. McCulloch, 338 Warren Hall

Summary of Basic College Requirements for Graduation

1. Credit Hours
   a. Minimum: 120
   b. Minimum with letter grade: 100
   c. Maximum independent study, internships: 15
   d. Minimum College of Agriculture and Life Sciences: 55
   e. Maximum from endowed colleges without additional charge: 55
   f. Maximum transferred in: 60, minimum at Cornell: 60

Note: Credits received for physical education and for certain other courses, such as Mathematics 109 and Education 005, do not count toward the 120 hours but are included on the transcript and in the grade-point average.

2. Residence
   a. Normally, eight full-time semesters
   b. Seven semesters, if all other degree requirements are met, with a grade-point average of 2.0
   c. Minimum of 12 credits per semester
   d. Minimum of two semesters in the College of Agriculture and Life Sciences (residency in the Division of Unclassified Students (DUS) does not count toward residency in the college)
   e. Students who have eight semesters in residence at Cornell, including two in the college, and who have eight or fewer credits remaining for graduation may petition for approval to complete this work elsewhere.

3. Physical Education
   a. Completion of University requirement for two terms of work
   b. Transfer students may be exempt from part or all of the requirement.

Note: Requests for postponement or exemption should be made in writing to the University Faculty Committee on Physical Education. Questions should be referred to Alan Gantert, Teagle Hall (255-4266).

4. Grade-Point Average (GPA)
   a. Cumulative GPA: 1.7 or above must be maintained
   b. Final GPA: 1.7 for a minimum of 12 credits in last term

Note: Only grades earned at Cornell and while registered in the college are included.

5. Distribution
   The purpose of the distribution requirement is to acquaint students with a broad range of subject matter that undergirds scholarship and research in agriculture and the life sciences. Credits received for independent study, field or work experience, and internships cannot be used to fulfill this requirement.
Courses judged to be remedial in the discipline, e.g., Education 005, will not be counted.

Group A: Physical Sciences. 9 credits of 100- or 200-level courses, in at least two disciplines, including 6 credits of chemistry or physics or mathematics

Agricultural Engineering 208–209
Agronomy 131
Chemistry Education 155
Geology
Mathematics (except 109)
Physics

Group B: Biological Sciences. 9 credits, including 6 of introductory biological science

Biology (except 201, 202, 205, 206, 301, 302)
Animal Sciences 220, 221
Entomology 212
Microbiology
Plant Breeding 225
Plant Pathology 301, 309

Group C: Social Sciences and Humanities. 9 credits with at least one course in each of the following two categories: Social Sciences. 100- or 200-level courses in the following departments, (excluding Freshman Seminars):

Archaeology
Anthropology
Economics
Government (includes Africana Studies 190)
Psychology (includes Education 110)
Sociology (includes Rural Sociology)

Humanities. 100-, 200-, and 300-level courses in the following departments (excluding Freshman Seminars and language courses):

Animal Sciences (humanities and history)
Asian and Near Eastern Studies
Classics
Comparative Literature
English (literature only)
French, German, Italian, Russian and Spanish (literature only)
History and History of Art/Architecture
Music and Theatre Arts (theory, literature, and history only)
Philosophy (also Natural Resources 407)

Group D: Written and Oral Expression. 9 credits, of which at least 6 must be in written expression, selected from the following:

Freshman Seminars
Communication 161, 201, 350, 352, 360, 363, 365
Hotel Administration 265

6. Mathematics

The Faculty requires minimum competency in mathematics as a requisite to satisfactory pursuit of a degree. All students must complete, with a passing grade, one course in mathematics as part of the physical sciences requirement. Advanced placement credit in mathematics or transfer credit in a college calculus course may be presented to meet this requirement.

a. The A&LS Mathematics Placement test: All entering undergraduates, except those presenting advanced placement or transfer credit in college calculus, must take the test, which is administered free of charge just prior to registration each semester. The test may not be repeated by any student. The placement test consists of fifty questions sampled from arithmetic, algebra, geometry, trigonometry, and a smattering of calculus. The index score is determined by the number of correct answers minus one quarter of the number of incorrect answers.

b. The index score is used to help students select appropriate courses. If a high index score (currently equal to or greater than 30) is attained, the mathematics requirement in physical sciences is waived. If a low index score (currently equal to or less than 12) is attained, the student is to enroll in Education 005. If after selecting a mathematics course to fulfill the requirement.

c. When presenting mathematics transfer credit, the student may

1. include precalculus credits along with the calculus credits
2. transfer up to 6 credits to the physical sciences requirement, if the index score is 30 or above
3. not transfer any credit to the physical sciences requirement if the index score is from 13 to 20 (credit may, however, be counted toward graduation)
4. not transfer any credit in mathematics if the index score is below 13

7. Faculty Adviser

a. Each student is assigned to a faculty adviser soon after being admitted to the college. The faculty adviser will help the student plan a program of study and enroll in courses appropriate to the degree programs offered by the college.

b. Course enrollment each semester should be planned in consultation with the faculty adviser. The signature of the faculty adviser indicates approval of, or at least consent to, the choice of courses made and is required before the course enrollment can be processed.

c. All academic plans, such as acceleration and graduate study, should be made in consultation with the student's faculty adviser. Support of the adviser is essential if a student petitions for an exception to any of the requirements of the college.

8. Progress toward the Degree

a. The progress of each student toward meeting the degree requirements is recorded each term in the college registrar's office on a summary of record form.

b. Students who have been in residence for eight semesters and who have met the graduation requirements will be graduated. Students are entitled to the full eight semesters even though they may have completed the graduation requirements. A student who wishes to continue study after graduation must apply for admission as a special student.

c. Graduation with distinction: Students who rank in the top 10 percent of the college graduates, based on the GPA for the last 60 credits completed at Cornell, will be graduated with distinction.

Students

Undergraduate enrollment is 3,000, with about 60 percent in the upper division. Each year about 850 students are graduated, while 650 freshmen and 250 transfer students are admitted. About 1,000 graduate students have members of the faculty of the college who serve as chairpersons of their Special Committees.

Admission

The College Admissions Committee selects applicants who are academically well prepared and appear most likely to profit from the college's various curricula.

Most students come from New York State, but nearly 20 percent come from other parts of the United States or abroad. About half of the undergraduates are women. Approximately 30 percent are identified as members of minority-ethnic groups.

Transfer Students

Any student who has withdrawn from one college and has been accepted in another is considered a transfer student. Approximately 20 percent of the A&LS undergraduate students are transfers who have taken part of their collegiate work at community colleges, agricultural and technical colleges, or other four-year institutions. Many of these hold an associate degree.

A Cornell student in good standing may apply for intra-University transfer to pursue a course of study unavailable in his or her current college. Guidelines are available in the Admissions Office of the College of Agriculture and Life Sciences, 195 Roberts Hall. The procedure includes filling a transfer request and submitting a letter explaining reasons for making the transfer.

Consideration is given to students who have demonstrated an interest in their intended field of study by taking appropriate prerequisite courses and courses within this area of study. Academic achievement is also considered. Students are seldom allowed to transfer during their freshman year.

In some cases, the student may be referred to the Division of Unclassified Students to study for one semester before entering the college. A second semester is considered under unusual circumstances. During this trial semester the student must achieve a predetermined average (usually 2.7) and take approved courses to assure acceptance.

Special Students

A limited number of non–degree candidates who want to take selected courses in the college are admitted each year. Applicants should submit the standard Cornell application, a résumé of their work experience, and a list of the courses they want to take. For more information, students should contact the Admissions Office, 195 Roberts Hall.

Part-time Students

All students in the College of Agriculture and Life Sciences are expected to be enrolled as full-time students in a registered program of study. Part-time students must register in the Division of Summer Session, Extramural Courses, and Related Programs. The Continuing Education Center, 103 Barnes Hall, provides information, counseling, and special programs for mature students throughout the University.

Off-Campus Students

Programs in which students study off campus but enroll for Cornell credit include SEA semester, field study in human ecology or industrial and labor relations, Albany programs, Cornell-in-Washington, student teaching, IPM internship, and clinical microbiology internship. Students intending to receive Cornell credit for work done off campus should inform the college registrar at the time of enrolling for courses to ensure that proper registration will occur.

Withdrawal

A student who finds it necessary to leave the University permanently should file a petition for withdrawal. Such petitions are approved if the student is in good standing. Students who have withdrawn and who later decide to return must apply to the Admissions Office.

Graduation

In preparation for graduation the student should complete the Candidacy for Baccalaureate Degree form in the college registrar's office. Diplomas are prepared by the Office of the University Registrar and distributed to those who have completed the degree requirements and have been approved by the college faculty. A copy of the final transcript, updated to include last-term courses, is mailed to the student by the University without charge.
Advising and Counseling Services

Faculty members in the College of Agriculture and Life Sciences recognize that students need information and advice to make intelligent decisions while they are in college. They believe that personal contact on a one-to-one basis is an important way to identify individual differences and needs of students. Faculty members believe that they can and should be an important source of information and advice on both academic and personal matters. Thus they consider advising to be an important and integral part of the undergraduate program.

Student Services

The Office of Student Services has overall responsibility for coordinating the college advising and academic counseling program. Each student enrolled in the college is assigned to a faculty adviser in the major field of study for aid in developing a program of study and to a peer adviser who has volunteered to help with problems of a general nature relating to personal matters and campus life.

The office is located in 17 Roberts Hall. Inquiries regarding procedures and services should be directed to Dr. Donald Burgeit and the staff.

Minority students in the College of Agriculture and Life Sciences receive counseling, tutoring, advising, and referral to appropriate resources that will meet their special needs. The Educational Opportunity Program (EOP) is a state-supported program intended to assist New York State students who meet specific economic and academic criteria set by the New York State Education Department. Students in the college who are eligible should apply to the program. Forms are available in 17 Roberts Hall.

The Office of Career Development offers a variety of services to all students and alumni of the college. Career development includes self-awareness and assessment, career exploration, decision making, and placement. Services are designed to assist students and alumni with these activities and to help them develop the skills that they will find useful as their career paths progress and change.

An active on-campus recruitment program is integrated with the other services provided by the office. "Job Opportunities" and a "Candidates Available" listing are published for students and employers respectively. The Career Library contains an extensive collection of current and useful material. The Discover II system is a computer-assisted guidance system that can help in career and educational planning, providing useful information and ideas about work-related interests, skills and values, occupations and careers, and graduate and professional schools. A career fair, career and educational planning, providing useful current and useful material. The Discover II system is a computer-assisted guidance system that can help in career and educational planning, providing useful information and ideas about work-related interests, skills and values, occupations and careers, and graduate and professional schools. A career fair, career and educational planning, providing useful current and useful material. The Discover II system is a computer-assisted guidance system that can help in career and educational planning, providing useful information and ideas about work-related interests, skills and values, occupations and careers, and graduate and professional schools. A career fair, career and educational planning, providing useful current and useful material. The Discover II system is a computer-assisted guidance system that can help in career and educational planning, providing useful current and useful material. The Discover II system is a computer-assisted guidance system that can help in career and educational planning, providing useful current and useful material. The Discover II system is a computer-assisted guidance system that can help in career and educational planning, providing useful current and useful material. The Discover II system is a computer-assisted guidance system that can help in career and educational planning, providing useful current and useful material. The Discover II system is a computer-assisted guidance system that can help in career and educational planning, providing useful current and useful material. The Discover II system is a computer-assisted guidance system that can help in career and educational planning, providing useful current and useful material.

Academic Integrity Policy

The College of Agriculture and Life Sciences faculty, students, and administration support and abide by the University Code of Academic Integrity. Its principle is that absolute integrity is expected of every student in all academic undertakings; students must in no way misrepresent their work, fraudulently or unfairly advance their academic status, or be a party to another student's failure to maintain academic integrity. The maintenance of an atmosphere of academic honor and the fulfillment of the provisions of the code are the responsibility of the students and the faculty. Therefore, all students and faculty members shall refrain from any action that would violate the basic principles of this code.

1) Students assume responsibility for the content and integrity of the work they submit, such as papers, examinations, or reports.
2) Students are guilty of violating the code if they:
   - knowingly represent the work of others as their own;
   - use or obtain unauthorized assistance in any academic work;
   - give fraudulent assistance to another student;
   - fabricate data in support of laboratory or field work;
   - forge a signature to certify completion or approval;
   - knowingly deprive other students of library resources, laboratory equipment, computer programs, and similar aids;
   - in any other manner violate the principle of absolute integrity.
3) Faculty members assume responsibility to make clear to students and teaching assistants specific regulations that apply to scholarly work in the discipline.
4) Faculty members fulfill their responsibility to:
   - maintain in all class, laboratory, and examination activities an atmosphere conducive to academic integrity and honor;
   - make clear the conditions under which examinations are to be given;
   - make clear the consequences of violating any aspects of the code;
   - provide the opportunities in which students are encouraged to discuss the content of courses with each other and to help each other to master it and to distinguish these activities from the course assignments that are meant to test what the students can do on their own without help from others.

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   - provide the opportunities in which students are encouraged to discuss the content of courses with each other and to help each other to master it and to distinguish these activities from the course assignments that are meant to test what the students can do on their own without help from others.

Individuals who observe or are aware of an alleged violation of the code should report the incident to the faculty member in charge of the course or to the chairman of the academic council. General information and details on procedures for suspected violations or hearings are available from the Office of Student Services, 17 Roberts Hall.

Academic Policies and Procedures

Records

The college registrar maintains for each student a complete record of academic achievement. A permanent record card is on file for each matriculated student and is updated whenever new information becomes available. Staff members are available in 192 Roberts Hall to consult with students regarding the assignment of credit toward meeting distribution and elective requirements and to verify the official summary of record.

The college Committee on Academic Achievement and Petitions is a standing committee of six college faculty members and two students. On behalf of the faculty and subject to its review, this committee:

- reviews, at the end of each semester and at other times as shall seem appropriate to the committee, the progress of all students not meeting academic requirements;
- receives and acts upon petitions from individual students asking for exceptions from particular academic regulations or requirements of the college, or for reconsideration of action previously taken by the committee;
- acts upon readmission requests from persons whose previous enrollment was terminated by the committee;
- notifies the petitioner in writing of the action taken by the committee.

Good academic standing means the student is eligible for, or has been allowed to register and enroll in, academic course work for the semester. Whether an individual student is in good academic standing is determined by the college registrar and the Committee on Academic Achievement and Petitions.

A petition to be exempt from a college academic requirement or regulation may be filed by any student who has grounds for exemption. Forms are available in the Office of Student Services, 17 Roberts Hall.

A petition is usually prepared with the assistance of the faculty adviser, whose signature is required to indicate awareness of the petition. The adviser's recommendation is helpful to the committee. The Committee determines whether there is evidence of mitigating and unforeseen circumstances beyond the control of the student that would warrant an exemption or other action.

Registration Procedures

All students must register with the University at the beginning of each semester. Registration materials are available at a time and place announced each term by the Office of the University Registrar.

Course Enrollment Procedures

To enroll in courses students pick up materials from the college Scheduling Office, 192 Roberts Hall; plan a schedule in consultation with their adviser; and return the completed forms to the Scheduling Office for verification and processing. Class lists are generated on the basis of the properly filled course enrollment forms.

To enroll in courses that involve independent study, teaching, or research the student must file an independent study statement. Students who will be studying off campus or abroad should fill the intent to
study off campus form to ensure that proper registration will occur. Both forms are available from the college registrar, 192 Roberts Hall.

Students may enroll again for a course in which they received a grade of F in a previous semester. The grade received the second time will be recorded and both grades calculated as part of the GPA.

Students should not enroll again for a course in which they received an incomplete. Work for that course should be completed, and the instructor will file a Change of Grade form.

Students enrolled in a two-semester course will receive an F at the end of the first semester and should enroll again for the same course the second semester. The letter grade will be recorded for the second semester when all work for the course is completed. A note on the transcript will explain the two grades for the same course.

Students are held for and receive a grade for those courses in which they enroll unless the student officially changes such enrollment. All changes in courses or credit, grading options, or sections must be made by the student at the Scheduling Office, 192 Roberts Hall, on an official form provided for that purpose.

Add/Drop/Changes are made by filing the properly signed forms in the Scheduling Office, 192 Roberts Hall. Approval and signature of the faculty adviser and course instructor is required to add or to drop a course.

Students may add courses during the first three weeks of the term and may drop courses until the end of the sixth week.

Students wishing to withdraw from a course after the end of the sixth week must petition to the college Committee on Academic Achievement and Petitions. A form is available in 17 Roberts Hall. Requests for course changes are approved only when the members of the committee are convinced that unusual circumstances are clearly beyond the control of the student. The committee assumes that students should have been able to make decisions about course content, total work load, and scheduling prior to the end of the sixth week of the semester.

If the petition to drop a course is approved after the end of the eighth week of classes, the course remains on the student's record and a W (for "withdrawal") is recorded on the transcript.

Grade Reports

Grade reports for the fall term are included in spring-term registration materials; grade reports for the spring term are mailed to students at their home addresses unless alternative addresses are reported to the college or University registrar by mid-May.

Academic Deficiency Policies

At the end of each semester, the Committee on Academic Achievement and Petitions reviews the records of those students who in any respect are failing to meet the academic requirements of the college or who persistently fail to attend classes. In case of students not making satisfactory progress, the committee takes appropriate action, including, but not limited to, issuing warnings to students, suspending them, requiring that they not reregister, granting them leaves of absence, and advising them to withdraw.

Specifically, the committee considers as possible cause for action, failure to attend and participate in courses on a regular basis or, at the end of any semester, failure to attain one or more of the following:

- semester GPA of at least 1.7.
- cumulative GPA of at least 1.7.
- satisfactory work in 12 or more credits per semester.
- reasonable progress toward completion of distribution requirements.
- appropriate completion of college and University requirements.

In general terms, regular participation in course work with academic loads at a level sufficient to assure graduation within eight semesters and grades averaging C- (1.7) or higher are prima facie evidence of satisfactory progress.

Dean's List

Students who complete a minimum of 12 credits for letter grades with a semester GPA of 3.30 or above and achieve a satisfactory grade in the Physical Education requirement, will be placed on the Dean's List of the College of Agriculture and Life Sciences for the semester in recognition of their outstanding scholastic record.

Honors Program

The Bachelor of Science degree with honors will be conferred upon those students who, in addition to having completed the requirements for the degree of Bachelor of Science, have satisfactorily completed the honors program in their area of major interest and have been recommended for the degree by the honors committee of that area.

Undergraduates who wish to enroll in the honors program must have completed at least 55 credits, at least 30 of the 55 at Cornell. Also, the student must have maintained a grade-point average of at least 3.0 at the time of entry.

Interested students must make written application no later than the end of the third week of the first semester of the senior year. An application form is available from the college registrar, 192 Roberts Hall, or from the area committee chairperson.

Written approval of the faculty member who will direct the research and of the honors committee in the area is required. After the college registrar verifies the student's grade-point average, the student will be officially enrolled in the honors program.

Academic credit may also be earned by enrolling in an appropriate independent study course. When applying for admission to the program, the student may, if appropriate, submit a budget and a modest request for funds to cover some of the costs the student incurs in doing the research.

The honors committee for each area recommends to the college registrar those students who qualify for honors. Only those who maintain a GPA of at least 3.0 will be graduated with honors.

Students in the College of Agriculture and Life Sciences wishing to participate in the honors program must be accepted in one of the program areas approved by the faculty. Students are not eligible for honors by participating in a program offered by another college or administrative unit.

Animal Sciences

Faculty committee: R. G. Warner, chairman; J. A. Marsh, R. L. Quaas.

Completion of the honors program in animal sciences requires the submission of a written report. This report is to be written in the style of a technical journal with one additional section, "Review of Literature." While it is expected that most students will undertake active research projects, a report totally devoted to review of literature may constitute a suitable project. When the report is submitted to the honors committee, it must be accompanied by supporting letters of evaluation from the faculty supervisor and at least one other faculty member. After reading the reports, the honors committee will interview each candidate regarding his or her project.

It is expected that the work required for honors will be above and beyond the requirements of any course, including Animal Sciences 499. However, it is anticipated that many projects may grow out of work initiated under Animal Sciences 499 or other courses. Since application to the program must be completed early in the senior year (two semesters prior to graduation), students are encouraged to make prior arrangements with faculty supervisors.

A detailed description of the animal science honors program and its requirements may be obtained from the committee chairperson.

Biological Sciences

Students interested in the honors program in the biological sciences should consult with their faculty advisers early in their junior year. Details pertaining to program requirements may be obtained from the Division Office of Academic Affairs, 118 Stimson Hall. Information on faculty research activities is available in the Behrman Biology Center, G20 Stimson Hall.

Entomology

Faculty committee: B. L. Peckarsky, chairman; W. L. Brown, Jr., H. H. Hagedorn, R. A. Morse, D. Pimentel, A. J. Sawyer

An honors program in the area of entomology may be pursued by any qualified student in the College of Agricultural and Life Sciences (see the requirements at the beginning of this section). The student need not be specializing in entomology. Insects, because of their variety, small size, and easy availability, are convenient subjects for study in a wide array of problems dealing with living systems. Short life cycles, unique physiologies and developmental patterns, and species with easily managed colony requirements and a wide range of behavioral traits provide the raw material for honors study. Cornell's diverse faculty interests and extensive collections and library in entomology are also major assets if a student selects entomology as the area for honors study.

The honors committee requires that an undergraduate who is interested in embarking upon an honors project proceed with the following steps:

- Discuss the matter with his or her academic adviser, preferably in the junior year, so that a research project can be carefully planned, including the possibility of conducting some research during the junior year and/or summer;
- Discuss the project with an appropriate faculty member in the Department of Entomology who can serve as a supervisor to oversee the honors research. (The faculty adviser will be of assistance in determining which faculty entomologist might be the best supervisor; the decision being based primarily upon the subject matter expertise of the available faculty);
- Prepare a brief tentative plan for the project for discussion and approval of the honors project adviser. This plan should include a statement of objects or hypotheses, proposed methods for testing hypotheses, needs for laboratory space or shared equipment, and a budget outlining financial support needed for travel and supplies.
- Present a completed application to the chairman of the entomology honors committee no later than the end of the third week of the senior year. Earlier submission is encouraged.
- Submit a brief progress report, approved by the project supervisor, to the entomology honors committee by midterm of the semester in which the student will complete his or her graduation requirements.
- Present a formal seminar reporting the significant findings of the research to the Department of Entomology (preferably as a Ph.D. dissertation seminar) in the last semester of the senior year.
- Submit two copies of the final project report (honors thesis) to the chairman of the entomology area honors committee no later than two weeks before the last day of classes in the semester in which the student anticipates graduation. The thesis will be reviewed by the faculty honors project supervisor and one other referee from the department honors committee.
committee will return the thesis to the student one week before the last day of classes. If reviewers indicate that changes must be made, the revised thesis should be submitted to the chairman no later than the last day of classes.

**Natural Resources**

Faculty committee: M. E. Richmond, chairman; J. W. Kelley, R. J. McNeil

The honors program in natural resources provides an opportunity for undergraduates to participate in independent research in the areas of fisheries and aquatic science, forest science, wildlife science, and conservation. The subject matter and nature of the research experience may be quite varied in this program but require the guidance and supervision of a faculty member with substantial interest or expertise in the problem area chosen.

In addition to meeting requirements of the college, the student is expected to do the following:

- Register for the honors program in the junior year.
- Select a faculty adviser who will help identify and formulate a research problem.
- Carry out an independent research effort that is original and separate from the work of others or may be investigating similar subjects.
- Describe and evaluate the work in the format of a conventional master's thesis or in the form of a scientific paper ready for journal submission. About half of the theses have been published.
- Write a thesis with at least two faculty or staff members who will agree to serve as readers for the thesis.
- Provide readers with a copy of the guidelines for evaluation of honors theses, available from the department's honors program committee.

**Nutritional Sciences**

Students interested in the honors program in nutritional sciences should consult with their faculty advisers early in their junior year. Details pertaining to program requirements may be obtained from Professor Mary Morrison, N-205A Martha Van Rensselaer Hall.

**Physical Sciences**

Faculty committee: W. F. Shipe, chairman; D. A. Hailth, D. J. Lathwell

The honors program in physical science provides outstanding students with an opportunity to do independent research under the supervision of a faculty member in the Departments of Agricultural Engineering, Agronomy, and Food Science.

Students must be enrolled in the program for a minimum of two semesters and must also enroll in the appropriate departmental independent study course for a total of at least 6 credits. They must submit a report of their research to the honors committee at least four weeks prior to the end of instruction of the semester in which they expect to graduate.

Details of the program can be obtained from the chairperson of the physical science honors committee.

**Plant Sciences**

Faculty committee: M. Petrovic, chairman; L. Creasy, R. L. Obendorf, C. Wien, R. P. Korf, S. Zinder

Before acceptance into the program, the student must submit to the chairperson of the plant sciences honors committee a completed application and a one-page tentative project outline by the end of the second week of classes in the first semester of their senior year. The project outline must be approved by the faculty supervisor and should include a clear statement of the objective(s) of the research, methodology, and needs for space, equipment, and supplies (attached budget required). Full committee approval is needed for acceptance into the program.

Completion of the honors program in plant sciences requires two copies of a report of independent research in the honors program to be submitted to the chairperson of the honors committee before the last day of classes of the semester in which the degree is sought. The report should be written in the format for research publication required by that discipline of plant science in which the student is enrolled. The report must be accompanied by a letter of recommendation from the supervisor of the research, that letter reflecting the supervisor's familiarity with the research and providing an evaluation of the performance and a recommendation for graduation with honors.

The honors committee will review the report, and if a majority of the committee votes favorably, the chairperson will recommend graduation with honors for that student in a letter to the director of instruction. One copy of the report will be returned to the student. The other will be shelved in Mann Library.

**Social Sciences**

Faculty committee: V. N. Rockcastle, chairman; R. Aplin, H. Capener, N. Awa

Honors degrees are awarded in the behavioral and social sciences upon approval of an honors thesis reporting a piece of original research in an appropriate area.

The research should deal with a substantive issue within the behavioral and social sciences. Both the results of the research and the methodology or the argument by which the results were achieved must be reported. Reviews of literature, practical conclusions and broad generalizations, or broad characterizations of an area of inquiry may constitute part of the research report but are not themselves sufficient to count as research. While work may originate in prior class work, it is expected the honors will extend it. Students may, however, register for independent study in conjunction with an honors project.

Reports must be written according to the form of any standard journal within the appropriate fields. Four copies of the thesis report must be submitted to the chairperson of the committee no later than three weeks prior to the last day of classes of the semester for which the degree is sought. A supporting letter from the faculty member supervising the work must also be submitted. Approval of the thesis requires a majority vote of the honors committee.

**Intercollege Programs**

The College of Agriculture and Life Sciences does not participate in any dual-degree programs. Study for the Bachelor of Science is the only undergraduate degree program offered.

**The College of Veterinary Medicine** may accept students to double-register in their seventh or eighth semester and complete requirements for the Bachelor of Science degree in the College of Agriculture and Life Sciences. Students should consult with the college registrar, 192 Roberts Hall, to assure that degree requirements have been fulfilled.

**Students who have been offered admission to the C. S. Johnson Graduate School of Management** upon completion of the B.S. degree in Agriculture and Life Sciences may take a program of management courses in their senior year if it is approved by their college faculty adviser as part of their undergraduate program. In certain cases an "upset" tuition charge, equal to the endowed undergraduate tuition rate, will be applied for undergraduate statutory college students taking excess credit hours from endowed colleges and schools. Inquiries should be directed to the University bursar.

**Students in the Field Program in Agricultural Engineering** are usually enrolled in the College of Agriculture and Life Sciences during the freshman and sophomore years, and jointly enrolled in this college and the College of Engineering in the junior and senior years. Students participate in the College's traditional honors program in the junior year. The curriculum is accredited by the Accreditation Board for Engineering and Technology. The B.S. degree is awarded in cooperation with the College of Engineering.

**The program in Landscape Architecture** is cosponsored by the Department of Floriculture and Ornamental Horticulture in the College of Agriculture and Life Sciences and by the College of Architecture, Art, and Planning. The program offers a first professional degree curriculum in landscape architecture at both undergraduate and graduate levels, as well as a graduate second professional degree program.

**The Division of Nutritional Sciences**

is an interdisciplinary intercollege program affiliated with the College of Human Ecology and the College of Agriculture and Life Sciences. The undergraduate nutrition major is based in the College of Human Ecology. Students in Agriculture and Life Sciences may study nutrition in areas such as animal sciences, poultry and avian sciences, food-industry management, food science, microbiology, pomology, and vegetable crops. Students may also plan a college minor in biological sciences, option 8, or a concentration in general studies in agriculture to include a human nutrition component.

**The Program on Science, Technology, and Society**

is an academic unit that engages in teaching and research involving the interactions of science and technology with social and political institutions. The program draws its students, faculty, and research staff from the various divisions of the University, including the College of Agriculture and Life Sciences. It offers an interdisciplinary undergraduate curriculum in Biology and Society. A concentration in the general studies in agriculture major may be planned in consultation with a faculty adviser to include a biology and society component. Further information, including a list of courses, may be obtained from the program office, 632 Clark Hall.

**The American Indian Program (AIP)**

is a multidisciplinary intercollege program with instructional, research, and extension components. The instructional core consists of courses focusing on American Indian life with emphasis on the Iroquois and other Indians of the Northeast. A description of the program and general information is available from the director of the American Indian Program, Caldwell Hall.

**The Comparative and Environmental Toxicology Program**

is an interdisciplinary intercollege program with instructional, research, and extension components coordinated by the Institute for Comparative and Environmental Toxicology (ICET). Courses are cosponsored by academic departments in several colleges of the University. A description of the program and general information is available from the director of the program through the ICET office, N202 Martha Van Rensselaer.

**The Cornell Laboratory of Environmental Applications of Remote Sensing (CLEARs)**

is an interdisciplinary intercollege center with teaching, research, and extension components affiliated with the College of Agriculture and Life Sciences, the Department of Agronomy, and the School of Civil and Environmental Engineering. A description of the program and general information is available from the director through the CLEARs office in Hollister Hall.

**Off-Campus Study Programs**

Study off campus is of two types: (1) credit may be earned at another institution and transferred to Cornell, or (2) credit may be earned in Cornell courses that require off-campus activity.
The intent to Study Off-Campus form should be filed with the college registrar before leaving campus. Tuition is prorated for off-campus study. In some cases stipends or cost of living allowances are provided.

Students should consult with the Office of Financial Aid if receiving financial aid and clear all accounts with the bursar prior to departure.

Students who plan to enroll in courses at another institution in the United States must petition to register for study in absentia. Courses should be selected in consultation with the faculty adviser. Approval of the petition, including the list of courses to be taken, guarantees acceptance of transfer credit if grades received are equivalent to C or better. The petition form is available in the Office of Student Services, 17 Roberts Hall, and should be returned there for consideration by the Committee on Academic Achievement and Petitions.

Albany Programs

Study off campus in Albany, the New York State Capitol, offers a unique opportunity to combine career interests with academic and legislative concerns. Students receive an intensive orientation to state government and attend a lecture-seminar program composed of three-credit components and offered by professors in residence. An internship experience, supervised by an internship committee, provides up to six academic credits. Independent study and research courses offered by the various departments in A&LS and/or courses offered by academic institutions in the Albany areas may be elected.

Three opportunities are available. The Assembly Intern Program provides a placement with a member of staff of the New York State Assembly. The Senate Assistants Program has placements with New York State senators and selected staff. The Albany Semester Program provides experience with a state agency such as the Departments of Environmental Conservation, Education, or Labor.

Applicants are screened by the A&LS Internship Committee in the term prior to assignments. Those accepted should plan a program of study in consultation with their faculty adviser. At least twelve credits must be carried to meet the residence requirement. Seniors should note that the last-term average must be 1.7 or above.

All internships will audit the orientation sessions and meet participation requirements in at least two of the lecture-seminar sections. The paper required in each section constitutes an independent study project to be directed and evaluated by a professor in an appropriate discipline. Normally a faculty member will not sponsor more than one of the independent study courses for any one student. To receive academic credit for the internship, students enroll in ALS 400, for an S-U grade only.

Information and applications are available in the Career Development Office, 16 Roberts Hall.

Cornell-in-Washington

Students in all colleges apply for the Cornell-in-Washington program through the Department of Government, 134 McGraw Hall. A&LS students admitted to the program should file the off-campus study form with the college registrar prior to leaving campus. Selection of courses should be made in consultation with one’s academic faculty adviser to assure that the courses are appropriate for the degree program being pursued. The course enrollment forms should be filed in the office of the college registrar as soon as course selection is completed and approved.

SEA Semester

Cornell University and the University of New Hampshire offer firsthand, field-oriented credit courses in the marine sciences at their cooperative field station on Appledore Island, Maine, in the historic Isles of Shoals. In cooperation with the Sea Education Association (SEA), a semester sequence of courses may be planned, including a six-week shore component at Woods Hole, Massachusetts, and a six-week sea component aboard the R/V Westward. For more information and application, students should consult the Cornell Marine Programs Office, G14 Stimson Hall. All A&LS students should file the Off-Campus form with the college registrar as early as possible to ensure proper registration and enrollment in courses.

Internships

Several departments in the college offer supervised independent study for academic credit. Arrangements should be made with the offering department for assignment of a faculty member who will be responsible for placement, for planning the program of work, and for evaluation of student performance.

For internships not governed by an established internship course, the student must enroll in a 497 course for the number of credits to be assigned. If the work is done during the summer, the student must enroll in the Cornell summer session for the agreed-upon credits.

In cases where the work is not done at Cornell, the awarding of credits depends upon a prior contractual arrangement between a Cornell professor and the student. Specific terms for receiving credit and a grade should be recorded, using the Independent Study, Research, Teaching, or Internship form, available in the Scheduling Office, 192 Roberts Hall.

A maximum of 15 of the 120 credits required for the degree may be taken in internships, independent study courses, and undergraduate teaching or research. A maximum of 6 credits per term may be earned in independent study. No more than 6 of the 15 credits allowed for independent study may be awarded for internships consisting of off-campus work experiences that do not have the continued presence of a Cornell faculty member. The 6-credit allotment includes transfer credit and credit for internships in other colleges at Cornell. The 6-credit limit does not apply to secondary, postsecondary, and cooperative extension teaching internships in the Department of Education.

The College of Agriculture and Life Sciences does not offer a field study option. In general, a rather narrow view is taken towards awarding academic credit for work experience, “life” experience, or apprenticeships. Credit will only be assigned or accepted in cases where the direct involvement of a professor is involved in determining both the course content and in evaluating a student’s work. The awarding of credit will not be allowed in cases where a student brings to the college or to a professor a description of a past experience and requests credit.

All students enrolling for an internship must file the Independent Study, Research, Teaching, or Internship form with the Scheduling Office. If the study is to take place off campus, the Intent to Study Off-Campus form should also be filed with the college registrar.

Overseas Academic Programs

The Cornell Abroad program is open to students in all colleges of the University. Students in the College of Agriculture and Life Sciences should consult with their faculty adviser and the college registrar to ensure that credits received for academic work abroad will meet requirements for graduation. The Office of Student Services, 17 Roberts Hall, has information and application forms.

Cooperative arrangements with the University of Reading, in England, and the University of Dublin, in Ireland, enable the college to endorse several students for a year of study under a tutor in these schools. The Swedish exchange program is operated in cooperation with the Agricultural College of Sweden at Uppsala. The A&LS student selected to participate in the Swedish exchange spends the junior year at Uppsala. All essential expenses in Sweden, including a living allowance, are provided by a student group there. Round-trip air transportation must be paid by the student. An exchange student from Uppsala spends a year at Cornell, partially supported by the college and student groups here.

Major Fields of Study

The college curriculum emphasizes the biological and physical sciences and the basic principles and theory of the study of agriculture and life sciences. The sixteen major program areas reflect the departmental academic effort in the college. Faculty curriculum committees in each area identify a sequence of courses appropriate to all students studying in that field. Courses of study are designed to provide systematic development of basic skills and concepts. Opportunity for concentration in an area of particular interest is usually available.

Programs are planned with considerable flexibility, allowing students to prepare for careers, graduate work, professional opportunities, and the responsibilities of educated citizens. Course requirements in each program area are different, but all students must meet minimum distribution requirements of the college.

Agricultural and Biological Engineering

Agricultural and biological engineering links technology and engineering with the biological, social, and agricultural sciences. It is the branch of engineering that serves agriculture, directly concerned with the means for providing food and fiber to fill the basic needs of all people. The challenge in agricultural engineering is to develop systems that increase production of food while maintaining the quality of the environment and minimizing energy use.

Students study topics such as machinery, soil and water conservation, management, power and energy, structures and building design, bioengineering, community development, food engineering, construction and design of secondary roads, the teaching of agricultural mechanization, and environmental-quality control.

The program is offered by the Department of Agricultural Engineering. It is housed in Riley-Robb Hall, which has one of the most complete agricultural engineering facilities in the United States.

Agricultural engineering is intended for the student who is particularly interested in the theoretical and fundamental aspects of engineering required for design and research. The specialization is offered by the New York State College of Agriculture and Life Sciences and the College of Engineering. The curriculum, described in the College of Engineering section, is accredited by the Accreditation Board for Engineering and Technology. Students double register in both colleges during their junior and senior years. The agricultural engineering specialization provides excellent preparation for a wide variety of jobs in most industries that serve agriculture. Qualified graduates may also continue study in a Master of Engineering, Master of Science, or doctoral degree program.

Agricultural engineering technology offers the student opportunities to take courses in such areas as agronomy, agricultural economics, natural resources, and agricultural science as well as plant physiology, food science, genetics, and microbiology. The emphasis is on technical aspects of the production of food, feed, and fiber.
Agriculture and Life Sciences

Some of the interest areas offered are the teaching of agricultural mechanization, power and machinery, soil and water management, and structures and their environments. Students may also prepare for work in cooperative extension.

Specific course requirements for agricultural engineering technology are:

A. Basic Subjects

<table>
<thead>
<tr>
<th>Subject</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Mathematics, including one semester of calculus</td>
<td>6</td>
</tr>
<tr>
<td>2. Chemistry</td>
<td>6</td>
</tr>
<tr>
<td>3. Physical sciences</td>
<td>8</td>
</tr>
</tbody>
</table>

- a) Physics (if no previous high school training in physics)
- b) Application of physical sciences
  (Ag Eng 208, 209)
- 4. Oral communication                        | 3       |
- 5. Computer programming                      | 3       |
- 6. Metal work or craftsmanship                | 2       |

B. Advanced and Applied Subjects

1. Agricultural sciences
   a) Soils                                    | 4       |
   b) Animal production                        | 3       |
   c) Plant production                         | 3       |
   d) Farm or business management              | 3       |

2. Five agricultural engineering courses at the 300 level or above | 15      |

Environmental technology is directed toward students with applied science and mathematical interests who have concern for the quality of the environment and a desire to deal with environmental-quality management problems from a technological perspective. The specialization combines basic training in physical and biological sciences, ecology, and environmental quality with a selection of courses oriented toward technical problem solving. A graduate from this area of specialization should have the ability to work with scientists and engineers in industry and governmental agencies on environmental planning, environmental impact studies, and pollution control or in sales, development, and research.

Specific course requirements for environmental technology are:

A. Basic Subjects

<table>
<thead>
<tr>
<th>Subject</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Calculus (Math 111, 112, and if graduate study is proposed, Math 214, 215, 216, 218)</td>
<td>6–10</td>
</tr>
<tr>
<td>2. Chemistry</td>
<td>6–8</td>
</tr>
<tr>
<td>3. Physics</td>
<td>8</td>
</tr>
<tr>
<td>4. Computer programming</td>
<td>3</td>
</tr>
<tr>
<td>5. Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>6. Introductory environmental sciences</td>
<td></td>
</tr>
<tr>
<td>a) Soil science</td>
<td>4</td>
</tr>
<tr>
<td>b) Natural resources</td>
<td>3</td>
</tr>
<tr>
<td>c) Microbiology</td>
<td>3</td>
</tr>
<tr>
<td>d) Ecology</td>
<td>3</td>
</tr>
</tbody>
</table>

B. Advanced and Applied Subjects

1. Technology
   a) Hydrology (Ag Eng 371)                  | 2       |
   b) Environmental systems analysis (Ag Eng 475) | 3       |

2. Environmental sciences: three courses selected from biochemistry, limnology, microbiology, natural resources, soil and water conservation, or atmospheric sciences | 9       |

3. Social sciences: two courses selected from economics, government, law, or sociology | 6       |

4. Environmental engineering: two engineering waste management courses at the 450 level or above | 6       |

Agronomy: Crops, Soils, and Meteorology

Agronomy, crop science, meteorology, soil science, and weed science are offered by the Department of Agronomy, which is located in Bradfield and Emerson Halls.

Agronomy is the study of crop production and soil management, and as a specialization it provides a broad education in all the agronomic sciences, including aspects of environmental quality. Students are expected to take at least ten credits of both crops and soils courses. In addition, agricultural meteorology, weed science, entomology, plant pathology, and farm management are recommended. Students interested in careers in agribusiness and with government agencies should also consider additional training in communication arts, applied economics, and computer science. Careers in research and development require course work in mathematics and chemistry.

Crop science is the application of basic biological and ecological concepts to the production and management of field crops. Examples of field crops are alfalfa, corn, soybeans, and wheat. Courses required include general biology, botany, plant physiology, general chemistry, calculus, chemistry, crop, soils, and students. Students who anticipate a career in agricultural production or service after completion of the B.S. degree should take additional courses in crops, soils, crop physiology, ecology, communication, plant pathology, entomology, nutrition, genetics, microbiology, and climatology. Students planning graduate or professional study beyond the bachelor's degree should take advanced course work in biochemistry and botany; qualitative, quantitative, and organic chemistry; and calculus, physics, and statistics.

Meteorology is the study of the atmosphere and the processes that shape our weather. The core curriculum in meteorology is designed to provide the student with an understanding of the fundamental physical and dynamical properties and processes of the atmosphere. All students are required to complete a minimum of three semesters of calculus, two semesters each of chemistry and physics, and a sequence of five courses covering general, theoretical, and synoptic meteorology. Additional courses are available for students interested in subjects of agricultural meteorology, forecasting, and physical meteorology. The curriculum satisfies the basic requirements for employment as a professional meteorologist and provides a sound background for graduate study or work in the numerous specialized areas of meteorological science. Students are encouraged to choose additional course work in related or complementary areas of interest, such as agriculture, biology, computer science, mathematics, statistics, physics, chemistry, or engineering.

Soil science is the application of basic physical and biological science to the classification, use, and management of soils on an ecologically sound basis. The curriculum in soil science combines training in the physical and biological sciences with a thorough background in soil science. Students take 16 credits in soil science, including 4 credits in the introductory course and 12 credits chosen from four of the following five areas: soil geography, soil chemistry, soil physics, soil microbiology, and soil fertility. In addition, 10 credits of chemistry, 6 credits of mathematics, and 6 credits of physics, as well as supporting biological sciences courses are expected to satisfy the major.

Weed science is that branch of pest management which emphasizes the principles and practice of weed control. The scientific basis for cultural, chemical, and biological control procedures is considered. Plant physiology, ecology, organic chemistry, and biochemistry are required in addition to fifteen credits in weed science and plant protection. The specialization is offered cooperatively by the Departments of Agronomy, Floriculture and Ornamental Horticulture, and Crop and Soil Environmental Sciences, but a variety of managed plant systems may be studied.

Animal Sciences

The animal sciences program area involves two departments—the Department of Animal Science (in Morrison Hall) and the Department of Poultry and Avian Sciences (in Rice Hall)—which offer a coordinated group of courses dealing with the principles of animal breeding, nutrition, physiology, management, and meat science. While emphasis in subject matter is directed towards farm animal species, including dairy and beef cattle, horses, poultry, pigs and sheep, laboratory and other species are used in research and teaching programs as well. The departments have extensive facilities for raising animals and well-equipped laboratories and classrooms, including a teaching barn, in which students can gain practical experience in the care and management of large animals at a convenient location on campus.

The program focuses on the application of science to the efficient production of animals for food, fiber, and pleasure and easily accommodates a variety of interests and goals. Beyond a core of basic courses (suggested minimum, 12 credits) students select production (minimum, 6 credits) and advanced (minimum, 6 credits) courses to fulfill an individually tailored program worked out in consultation with their advisers. In this way it is possible to concentrate by species as well as by subject matter (nutrition, physiology, breeding, management, meat science). Dairy management, for example, is a popular program among students who may be preparing to manage a dairy farm or enter a related career. Supporting courses in other departments are readily available and strongly encouraged. Thus some students elect a program emphasizing supportive preparation in the basic physical and biological sciences appropriate to graduate or professional study. Others elect a program heavily oriented towards economics and business in preparation for a career in the poultry, dairy, meat-animal, horse, feed, or meats industry. These are but two examples of the programs that can be developed to meet a student's career interests. It is highly recommended that students obtain appropriate fieldwork experience during summers.

Several special training opportunities exist for highly motivated students. Upperclass students whose academic record may by arrangement with individual faculty members, engage in research (either for credit or for honors) or assist with teaching (for credit). The Dairy Management Fellows program offers an equally challenging but different type of experience for a highly selected group of students.

Applied Economics and Business Management

In applied economics and business management, students may choose several specializations and options. Courses in agricultural economics are supplemented with others in related areas such as computer science, economics, sociology, history, government, industrial and labor relations, hotel administration, consumer economics, animal sciences, plant sciences, natural resources, mathematics, and statistics.

Students with outstanding academic records may apply to coregister in the Johnson Graduate School of Management in their senior year. For information, those interested should contact the Admissions Office, 315 Malott Hall.

The program in applied economics and business management is based in the Department of Agricultural Economics and housed in Warren Hall.

Agricultural economics provides a general program in the economics of the agricultural sector. It is an appropriate major for those students who want to (1) survey offerings in agricultural economics, such as
management, marketing, economic development, and policy and resource economics; and (2) prepare for graduate work in agricultural economics.

Business management and marketing applies the principles of economics and the tools of management to prepare students for careers in business. Special emphasis is given to developing decision-making skills and the effective means of adapting written and oral communication. Special emphasis is given to developing decision-making skills and the effective means of adapting written and oral communication. Marketing: Marketing 3

Ag Ec 220, Introduction to Business

Ag Ec 221, Accounting

Ag Ec 240, Marketing

Ag Ec 310, Introductory Statistics

Biological Sciences

The program of study in biology is offered by the Division of Biological Sciences. Students enroll in either the College of Agriculture and Life Sciences or the College of Arts and Sciences.

Areas of concentration include general biology, animal physiology and anatomy; biochemistry; botany; cell biology; ecology, systematics, and evolution; genetics and development; neurobiology and behavior; and an independent option. Programs of study are described under the Division of Biological Sciences.

Communication

Everyone relates to others through the process of communication. Whether these human linkages are personal or through the mass media, there is an increasing need for individuals who can help establish communication relationships and make them more efficient and effective. Individuals who are able to do this must have good communication skills themselves and must be able to adapt these skills to interpersonal, audio, and visual communication to audiences. The curriculum emphasizes learning communication theory along with communication skills.

Students elect one of three different sequences by the beginning of their junior year: public communication, interpersonal communication, and intercultural communication. Whether these human linkages are interpersonal, audio, and visual communication to audiences. The curriculum emphasizes learning communication theory along with communication skills.

Certification is required to teach in public secondary schools. Agricultural certification areas are agricultural mechanization, conservation, farm production and management, horse handling and care, ornamental horticulture, and small animal care. Provisional certification requirements are based on a state teacher's test and are also required. Provisional certification requires a master's degree. Persons with a baccalaureate degree in technical agriculture may earn certification through a master's degree in agricultural education.

Directed field experiences, internships, and selected education courses are used to prepare students for agricultural educator positions not requiring certification.

Further information is available from the agricultural education coordinator, Roberts Hall (telephone: 255-2197).

General education. Options not leading directly to certification are available.

By selecting courses in the Department of Education, students can prepare for positions in areas such as counseling, youth-group leadership, cooperative extension, and the Peace Corps. Students can also prepare themselves for graduate programs in science education, environmental education, educational psychology, research methods, extension, adult and continuing education, and the social, economic/legal/philosophical foundations of education. Although this option does not provide for certification in science teaching, it can make students eligible for admission to graduate programs that, in turn, lead to certification.

Students with interest in general careers other than those listed above will find that courses offered by the Department of Education can provide appropriate study to supplement their subject area. Combined with courses in the other social sciences, especially communication arts, such a program provides a useful base for careers that involve strong working relationships with people.

Interested students should contact the education coordinator, Roberts Hall (telephone: 255-6524).

Entomology

The intent of this curriculum is to provide students with a basic background in the biological and environmental sciences, with a special emphasis on the study of insects. Many students pursue graduate study in entomology or related sciences upon completion of the B.S. degree, and the requirements are based on a preprofessional degree. Those who do not anticipate graduate training are urged to select electives of immediate value to the careers they plan. Some suggestions are made in section B below.

A. Specific Requirements

Basic Sciences

College mathematics, including calculus

Chemistry 103–104 or 207–208

Chemistry 253 (organic)

General Biology

Introductory biology

Biological Sciences 330 or 331, Principles of Biochemistry

Biological Sciences 311, Introductory Animal Physiology

Biological Sciences 281, Genetics, or Plant Breeding

225, Plant Genetics

Biological Sciences 221, Neurobiology and Behavior

Biological Sciences 360, General Ecology
Entomology
Entomology 212, Insect Biology, or 241, Applied Entomology
Entomology 322, Insect Morphology
Entomology 331, Insect Taxonomy
Two courses selected from the groups below. Both may not be from the same group:

Group a
Entomology 444, Integrated Pest Management
Entomology 477, Biological Control
Entomology 690, Insect Toxicology and Insecticidal Chemistry

Group b
Entomology 455, Insect Ecology
Entomology 471, Ecology and Systematics of Freshwater Invertebrates
Entomology —, Insect Behavior (in planning)

Group c
Entomology 452, Medical Entomology
Entomology 452, Insect Pathology
Entomology 483, Insect Physiology

B. Suggested Electives
The choice of electives should reflect a student’s particular interests within entomology, especially whether they run towards the impact of insects on human welfare or towards the more basic aspects of insect biology. Courses in botany, evolution, invertebrate zoology, microbiology, cell biology and histology, vertebrate biology, statistics, foreign languages, scientific writing, oral communication, plant pathology, and other areas of agriculture are also recommended.

Food Science
The food science program area is designed to provide students with basic skills and the knowledge necessary to ensure an adequate food supply. Students in this program take a core of fundamental courses and in consultation with faculty advisers select courses suitable for specific career objectives.

The core is designed to meet minimum guidelines of the Institute of Food Technologists, the professional society of United States food scientists. The flexibility of the food science program allows students to prepare for a variety of positions in industry, government, or education. Some of the positions and areas of work require graduate training, and it can be useful in others as well. Opportunities for graduate study exist at a number of universities, including Cornell.

During the first two years, students are required to take the two-semester introductory courses in biology, chemistry, and physics plus introductory courses in microbiology, calculus, organic chemistry, food science, and nutrition. During the last two years, students take courses dealing with the application of science and technology to the processing, preservation, distribution, and utilization of foods. This includes the following required courses: Food Analysis, Nutritional Aspects of Food Processing, Food Engineering I and II, Sanitation and Public Health, Food Processing I and II, Food Chemistry, Sensory and Objective Evaluations of Foods, Food Microbiology, Food Chemistry Laboratory, and introductory statistics. Students also take courses in the social sciences and humanities to meet the general college requirements.

Students may choose additional courses in chemistry, microbiology, or nutrition in preparation for careers in research and development in mathematics and engineering for careers in processing and engineering; in marketing and business management; or in a variety of production courses related to specific commodities. Emphasis may be placed on the international aspects of food science.

Students are strongly encouraged to obtain further competence in one or more areas of emphasis. Lists of recommended courses are available for many areas, but the student is free to select courses for special objectives. The areas of emphasis include processing technology; food chemistry; nutritional aspects of processing technology; management and dairy science; meat, poultry, and fish technology; food microbiology; and international food development.

The program is offered by the Department of Food Science, housed in Stocking Hall. A full-scale dairy plant and extensive laboratory facilities are available for training, research, and employment.

Landscape Architecture
Landscape architecture is a licensed profession in most states. In New York State both the practice of landscape architecture and the use of the title landscape architect are restricted by law. Qualifications for licensing include completion of a specified period of approved professional work experience and passing a comprehensive state licensing examination.

Bachelor of Science Curriculum
The landscape architecture undergraduate curriculum is a four-year professional program leading to a Bachelor of Science degree. The program is accredited by the American Society of Landscape Architects and is registered with the New York State Education Department, State Board for Landscape Architecture.

The undergraduate curriculum in landscape architecture centers around a three-year sequence of design studio courses that begins in the fall semester of the sophomore year. Transfer applicants are considered for fall-term admission only.

Core courses in design, plant materials, landscape history and theory, landscape planning, landscape materials and construction, graphics, and natural sciences are required throughout the four-year curriculum. Studio courses deal with the application of design methods and principles that reflect knowledge and appreciation of land, water, plants, and the built environment in planning and designing landscapes for public and private use. Basic to the curriculum is concern for the creation of environments that meet complex social needs and are ecologically sound and aesthetically pleasing. Requirements for specialization in landscape architecture include satisfactory completion of the core curriculum.

An option for study abroad in Denmark is incorporated into the spring semester of the junior year. Under a special arrangement between Cornell University and the University of Copenhagen, landscape architecture majors who have completed four semesters of design, and who have a cumulative average of 3.0 or above, have the option of participating in a uniquely developed architecture and design studies curriculum in Denmark.

The International Student Program in Landscape Architecture is a four-year professional program leading to a Bachelor of Science degree in landscape architecture and the use of the title landscape architect are restricted by law. Qualifications for licensing include completion of a specified period of approved professional work experience and passing a comprehensive state licensing examination.

Second Year

<table>
<thead>
<tr>
<th>Fall Term</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>*LA 220, Principles of Spatial Design</td>
<td>3</td>
</tr>
<tr>
<td>*LA 201, Theory and Application Studio</td>
<td>6</td>
</tr>
<tr>
<td>*LA 205, Graphic Communication</td>
<td>3</td>
</tr>
<tr>
<td>*FIOH 313, Woody Plant Materials for Landscape Use</td>
<td>3</td>
</tr>
</tbody>
</table>

Spring Term

<table>
<thead>
<tr>
<th>Fall Term</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>*LA 202, Project Design and Site-Planning Studio</td>
<td>6</td>
</tr>
<tr>
<td>*LA 310, Site Construction I</td>
<td>4</td>
</tr>
<tr>
<td>*LA 521, History of Landscape Architecture I</td>
<td>3</td>
</tr>
<tr>
<td>Physical sciences elective</td>
<td>3</td>
</tr>
</tbody>
</table>

Third Year

<table>
<thead>
<tr>
<th>Fall Term</th>
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</tr>
</thead>
<tbody>
<tr>
<td>*LA 301, Natural Systems and Planting Design Studio</td>
<td>6</td>
</tr>
<tr>
<td>*LA 522, History of Landscape Architecture II</td>
<td>3</td>
</tr>
<tr>
<td>Free elective</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Spring Term</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>*LA 302, Urban Systems Studio</td>
<td>6</td>
</tr>
<tr>
<td>Written or oral expression elective</td>
<td>3</td>
</tr>
<tr>
<td>Physical sciences elective</td>
<td>3</td>
</tr>
<tr>
<td>Free elective</td>
<td>3</td>
</tr>
</tbody>
</table>

Fourth Year

<table>
<thead>
<tr>
<th>Fall Term</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>*LA 400, Professional Practice Seminar</td>
<td>2</td>
</tr>
<tr>
<td>*LA 401, Advanced Project Design and Graphics Studio</td>
<td>6</td>
</tr>
<tr>
<td>*LA 520, Contemporary Issues in Landscape Architecture</td>
<td>2</td>
</tr>
<tr>
<td>Biological sciences elective</td>
<td>3</td>
</tr>
<tr>
<td>Free elective</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Spring Term</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>*LA 402, Senior Project Studio</td>
<td>6</td>
</tr>
<tr>
<td>*LA 312, Site Construction II</td>
<td>4</td>
</tr>
<tr>
<td>Social sciences or humanities elective</td>
<td>3</td>
</tr>
<tr>
<td>Free elective</td>
<td>3</td>
</tr>
</tbody>
</table>

Summary of credit requirements

- Specialization requirements | 69       |
- Distribution electives | 36       |
- Free electives | 15       |
- Total | 120      

Master of Landscape Architecture (M.L.A.) degree

First professional degree curriculum. The three-year M.L.A. curriculum is accredited by the American Society of Landscape Architects and organized to prepare a student for professional practice in landscape architecture. It is structured to provide a first professional degree for students with a bachelor's degree in areas other than landscape architecture or architecture.

Through a course sequence intended to develop basic landscape architectural skills and concepts, the three-year curriculum provides opportunities for students from diverse educational backgrounds to become proficient in landscape design, site construction, graphic communication, plant materials, and other related areas necessary to enter the profession fully qualified at the master's level.

Requirements of the three-year M.L.A. curriculum include 90 credits, satisfactory completion of the core curriculum courses, an approved summer internship, and a thesis or final project.
Microbiology

Microbiologists study microbes such as bacteria, viruses, rickettsiae, mycoplasmas, fungi, algae, and protozoa. Some of these organisms cause diseases, but many contribute to the balance of nature or are otherwise beneficial. Microbiological research involves recombinant DNA technology; alternative methods of energy production and waste recycling; new sources of food; new wonder drugs; and the etiology of sexually transmitted diseases, cancer, hospital-related infections, allergies, and other infectious diseases. Microbiology touches on clinical, veterinary, public health, agricultural, environmental, and industrial areas.

Students in the Department of Microbiology are provided with basic background courses in the biological and physical sciences as well as an introduction to the theoretical and laboratory techniques of basic areas in microbiology, such as microbial physiology, microbiology of pathogens, microbial ecology, and microbial genetics. Fields closely related to microbiology include biochemistry, genetics, food science, animal science, and agronomy. Students are provided with strong laboratory as well as classroom training, and they may prepare for careers options in the developing biotechnology industry, food microbiology, pharmaceutical companies, and other industrial concerns that involve the manipulation of microorganisms for commercial purposes. Students who complete the program are often able to find employment in these areas without further training. They may also find employment as technicians working in hospitals, government, or university research laboratories. Many elect to continue their education at the graduate level, either in microbiology or related fields, or to enter professional schools such as medical, veterinary, or dental colleges.

To provide a firm background in basic sciences, courses required for the microbiology major program include calculus, general and organic chemistry, biochemistry, and genetics. Microbiology courses required include introductory and advanced general microbiology, microbial genetics, microbial physiology, and patragnostic microbiology or immunology (taught in the College of Veterinary Medicine) plus additional laboratory and lecture courses in microbiology to fulfill the requirements for accreditation by the American Academy of Microbiology. It is possible for students with a record of high-quality performance to conduct research projects during their senior year. Elective microbiology courses are available in microbial ecology, food microbiology, bacterial diversity, tissue culture techniques, prokaryotic cytology, soil microbiology, immunology, microbial engineering, and virology. A limited number of students who have completed the departmental course requirements by the end of their junior year may be selected for a Clinical Microbiology Specialization Program. Such students spend their senior year at Cornell Medical College and the New York Hospital studying and working in clinical microbiology.

The oldest and largest single biological science membership organization in the world, the American Society for Microbiology (ASM), was founded in 1899 as the Society of American Bacteriologists. The ASM headquarters is located at 1931 1 Street NW, Washington, D.C. 20006.

More information may be obtained from the Department of Microbiology, Stocking Hall.

Natural Resources

This undergraduate curriculum is designed to provide an enduring and broadly applicable education. A liberal education with a strong biological and natural sciences base is emphasized. Students are provided an opportunity to understand the world around them and are exposed to ecological concepts that may form a principal basis for their future decisions and training.

The program is based in the Department of Natural Resources and is based in Fennow Hall, The Arno Forest Teaching and Research Center, a biological field station laboratory within driving distance of the campus, has facilities for field-oriented courses, workshops, and opportunity for in-residence study at the Arno Camp. The curriculum helps prepare students for many useful endeavors and can serve as a base for graduate work in many fields. Students are prepared to appreciate and understand their natural environment and man's impact on it. A foundation is developed for the many students who continue with graduate professional training in natural resource conservation, wildlife science, fishery and aquatic sciences, and related resource programs.

Students are encouraged to study in each of the eight learning areas listed below:

1) Understanding basic substrates for life: geology, soils, meteorology, energy, ecology, water resources
2) Understanding natural processes: chemistry, physics, ecology, field biology
3) Understanding how organisms function: biology, physiology, anatomy, behavior
4) Understanding how people function: psychology, sociology, politics, history, anthropology, law, economics
5) Identifying and measuring the environment: taxonomy, resource inventory, air-photo interpretation
6) Learning and developing basic life skills: communication, thinking, making decisions, logic, planning, philosophy, ethics, and others
7) Learning special skills: mathematics, statistics, computer science, resource management, law
8) Learning about the world: Students should recognize that not all learning takes place in the classroom. Exploring different careers, participating in campus and community activities, and independent research all contribute to continuing growth.

Students need not select an area of concentration, but those who wish to do so may specialize further in wildlife science, forest science, aquatic science, and fishery science.

Students should seek relevant work experience to complement their academic studies.

Plant Sciences

Plant sciences students may specialize in general plant science, plant breeding, plant pathology, plant protection, field crops, horticulture, and ornamental agriculture. Students may combine one of these areas with some other area of study. Students who wish to do so may specialize further in agriculture, food science, or agricultural economics.
Undergraduates are encouraged to obtain practical experience. This may involve research under the direction of a faculty member or work in a commercial industry or on a farm. Departments will assist students looking for positions that would provide useful experience.

**Floriculture and ornamental horticulture** applies principles of plant science and business management to the production and marketing of florist, nursery, and turfgrass crops, as well as to the selection and management of horticultural plants for both indoor and outdoor landscapes. Programs prepare students for careers at the professional and managerial levels in horticultural business, research, teaching, communications, and extension and public education.

The core curriculum consists of the following courses:

**Flor 100**, **Introduction to Floriculture and Ornamental Horticulture**

**Flor 213**, **Woody Plant Materials**

**Flor 312**, **Garden and Interior Plants I**

**Flor 401**, **Principles of Plant Propagation**

**Bio S 241**, **Plant Biology (Introductory Botany)**

**Bio S 242**, **Plant Physiology (lecture)**

**Bio S 244**, **Plant Physiology (laboratory)**

**Agron 260**, **Nature and Properties of Soils**

**Entom 241**, **Applied Entomology, or Entom 212, Introductory Entomology**

**Flor 301**, **Introductory Pathology**

Although mastery of these subject areas is considered essential for students planning to enter a floriculture or landscape horticulture career, justifiable exceptions to the core curriculum may be granted by the student’s adviser.

With permission of their adviser, transfer students may receive core curriculum credit for similar courses taken at other institutions provided that transfer credit is granted by the college. In addition, all transfer students must complete a minimum of 12 credits in floriculture and ornamental horticulture at Cornell. No more than two of the following landscape architecture courses may be included in this 12-credit requirement: **LA 140**, **LA 220**, **LA 311**, or **LA 312**. No other landscape architecture or freehand drawing courses may be applied to this requirement because they do not contain horticultural subject matter.

Students are also asked to select an area of emphasis in either floriculture or landscape horticulture by the beginning of their junior year. Specialization in floriculture prepares a career student for a position in greenhouse florist crop production management and wholesale and retail florist marketing, whereas specialization in landscape horticulture trains one for careers in landscape design, turfgrass management, landscape contracting and service, retail and wholesale marketing of nursery products and services, botanical garden and arboretum management, urban horticulture, and related areas.

Some students choose to pursue a general program in floriculture and landscape horticulture, including courses in both areas. Similarly, programs in horticultural business management, research, teaching, extension and public education, and communications may be arranged across two specialization areas.

Students wishing to prepare for graduate study in horticulture may develop a program in basic sciences and their application in horticultural science. Lists of recommended courses for the areas of specialization are available from student advisors.

The program offers each student, working with his or her faculty adviser, an opportunity to tailor a program to achieve individual educational objectives in floriculture and landscape horticulture and to prepare students also are encouraged to take courses in these areas:

- Agricultural economics and business management
- Agricultural engineering, agronomy (soils), computer science, ecology, entomology, geology, plant pathology, plant physiology, oral and written expression, and plant taxonomy
- Use of electives to pursue study in the humanities and in other areas of special interest to the student is encouraged and provides opportunities for broadening and enriching learning experiences. Numerous opportunities to become familiar with the horticultural industries and professions are provided through field trips, research projects, independent student or small-group study, optional and work experience programs.

Questions concerning the undergraduate curriculum, advising, and related matters should be addressed to Dr. Carl E. Gort, Chair, Floriculture and Ornamental Horticulture, 20 Plant Science Building, Ithaca, New York 14853-5008 (telephone: 607/255-2048).

The department’s office is Plant Science Building.

Departmental facilities include classrooms and laboratories for instruction in the greenhouse, and laboratory facilities at the Kenneth Post Laboratory, the Test Garden, the Turfgrass Research Field Laboratory, landscape architecture studios in East Roberts Hall, and freehand drawing studios in Mann Library.

**Plant biology** provides undergraduates with preparation for graduate study in the plant sciences involved with basic rather than applied research. In cooperation with an adviser, each student plans a curriculum with a concentration in basic sciences supplemented by courses in applied areas that seem appropriate. Options include molecular biology, plant physiology, plant biology, genetics, cytology, organic chemistry, biochemistry, anatomy, taxonomy, ecology and evolution, and statistics. A core of courses is strongly suggested, which includes botany, genetics, cytology, plant biology, and physiology. However, different specialities within plant biology afford a flexible curriculum.

**Plant breeding** provides undergraduates with preparation for graduate study in the plant sciences involved with basic rather than applied research. In cooperation with an adviser, each student plans a curriculum with a concentration in basic sciences supplemented by courses in applied areas that seem appropriate. Options include molecular biology, plant physiology, plant biology, genetics, cytology, organic chemistry, biochemistry, anatomy, taxonomy, ecology and evolution, and statistics. A core of courses is strongly suggested, which includes botany, genetics, cytology, plant biology, and physiology. However, different specialities within plant biology afford a flexible curriculum.

**Plant breeding** provides undergraduates with preparation for graduate study in the plant sciences involved with basic rather than applied research. In cooperation with an adviser, each student plans a curriculum with a concentration in basic sciences supplemented by courses in applied areas that seem appropriate. Options include molecular biology, plant physiology, plant biology, genetics, cytology, organic chemistry, biochemistry, anatomy, taxonomy, ecology and evolution, and statistics. A core of courses is strongly suggested, which includes botany, genetics, cytology, plant biology, and physiology. However, different specialities within plant biology afford a flexible curriculum.

**Plant biotechnology** provides undergraduates with preparation for graduate study in the plant sciences involved with basic rather than applied research. In cooperation with an adviser, each student plans a curriculum with a concentration in basic sciences supplemented by courses in applied areas that seem appropriate. Options include molecular biology, plant physiology, plant biology, genetics, cytology, organic chemistry, biochemistry, anatomy, taxonomy, ecology and evolution, and statistics. A core of courses is strongly suggested, which includes botany, genetics, cytology, plant biology, and physiology. However, different specialities within plant biology afford a flexible curriculum.

**Plant pathology** requires broad training in the physical and biological sciences plus a general background in the area of crop production with emphasis on crop protection. Specific requirements depend upon the career the student is interested in, such as mycological or microbiological technician, biological research technician, technical representative for agricultural industry, cooperative extension agent, plant protection technician, or biology teacher. Students may also be interested in graduate work in plant pathology or some other area of biology.

A core of basic and applied courses is strongly suggested, including chemistry, mathematics, physics and biological sciences, plant breeding, and plant pathology. Courses chosen from agronomy, entomology, floriculture and ornamental horticulture, pomology, or vegetable crops complete the program.

**Plant protection** is offered for students who are interested in pest control measure. The study of insects, diseases, weeds, vertebrate pests, and other factors that prevent maximum crop production may prepare students for careers in agribusiness, the agrichemical industry, cooperative extension, pest management consulting, state and federal regulatory work, and a variety of other technical positions. Although designed as a terminal program for students desiring a practical preparation in general plant protection, this specialization may also provide an adequate background for graduate work in entomology, plant pathology, or weed science.

The following subjects are considered essential to the plant protection specialization: botany and plant physiology, general ecology, soils, crop science, and microbiology. Additional courses in introductory entomology, insect pest management, introductory plant pathology, plant protection, integrated weed science, and pest management for plant protection are recommended. Students should plan to take a total of 62 to 70 credits in courses required and recommended for the specialization.

In addition, a number of other subjects pertinent to plant protection may be arranged across two specialization areas. Student’s interests: agricultural economics, agricultural engineering, agronomy, biochemistry, communication arts, pathology and entomology, general physics, genetics, meteorology, mycology, pesticides in the environment, and plant anatomy. Employment involves practical experience in plant protection between the junior and senior years on a farm, at an experiment station, with an agrichemical company, or with a regulatory agency is encouraged.

**Pomology** (the science of fruit growing) provides students with knowledge of the scientific technology and capabilities of the fruit industry. Positions in the production, handling, and storage of deciduous fruit crops. New York is a national leader in fruit production with an on-farm value of over $155 million, generating an estimated $620 million to the static economy.

Courses are selected by the student in consultation with a faculty adviser. Flexibility in programs makes it possible to establish a course of study to fit the desired goals of individual students. The diverse pomology curriculum, complemented by courses in basic sciences and arts electives in the student’s area of interest, prepares the pomology major for a career in fruit production, agricultural business related to the fruit industry, storage and merchandising, or as a professional pomologist. Opportunities for graduates can be found in fruit production, marketing, sales and service, research, teaching, and extension.

**Vegetable crops** is one of the most diverse applied and scientific fields in agriculture. In New York more than twenty economically important vegetables are produced and marketed. Vegetable crops have a high value per acre, making it economically feasible to invest research and teaching in the growing, harvest, and marketing of vegetables. Many vegetables are highly perishable; consequently, considerable expenditure is made for refrigeration and special storage facilities as well as for packaging and handling techniques that have been specifically developed for each particular crop.

The opportunities for trained personnel are numerous in all aspects of vegetable production and the closely related fields of purchasing, processing, merchandising, extension, and banking. Some students may continue their studies in graduate school in preparation for teaching, research, or cooperative extension work in colleges and universities or in private industry. Recently there has been an increased interest in growing vegetables in tropical countries, and international agriculture, with a specialization in vegetable crops, provides excellent training for this vocation.

The different specialties within vegetable crops afford a very flexible curriculum. Courses are chosen by the student in consultation with an advising committee and other members of the staff. Students usually take most of the courses offered by the Department of Vegetable Crops and commonly choose other courses from accounting, agricultural geography, climatology, entomology, soil fertility, and regional agriculture; plant biology, physiology, ecology, and anatomy; oral expression; food sciences; nutritional sciences; plant genetics, statistics, and plant breeding; and pest control for plant diseases and their control, and weed science. Students supplement their course work with study in areas in which they have particular interest.
Rural Sociology

Universally, people live in groups and societies and therein experience a variety of organizations, institutions, technical conditions, and processes of social change. At Cornell, rural sociology students study these facets of society in both domestic and international rural settings. Among the topical areas in which the faculty members of rural sociology specialize are rural development and cultural change, community and regional structure and process, environmental sociology, sociology of agriculture, rural industrialization and labor markets, political economy, and research methodology. Students specialize in one of four areas described below. Regardless of the area of specialization, all students learn theory and methodology of sociology and how to apply both to research in their subject area.

Recognizing that students are concerned with future career opportunities, the undergraduate program emphasizes acquisition of skills as well as general knowledge in preparation for jobs or further study upon graduation. Accordingly, students are expected to become involved in the application of theory, methodology, and principles and concepts to analysis of practical problems.

Rural sociology offers degree programs at both the undergraduate and graduate levels (B.S., M.S., M.P.S., or Ph.D.). These programs are offered through the Department of Rural Sociology, which maintains offices in Warren Hall. For many years, this department has been recognized as one of the top departments in the area and is known for its innovative program orientation. Faculty members in this department are committed to both quality instruction and research programs.

Being located in a college of agriculture, faculty members maintain strong ties with the technical fields in the college as well as with the international Agriculture Program, the Biology and Society Program, the Women in Development Program, the Center for International Studies, and the Cornell Institute for Social and Economic Research. Department members also maintain working relations with general sociology, and many other social science units located in other colleges at Cornell. Students are encouraged to supplement their course work by electing courses in other departments and programs, thereby rounding out their educational objective by acquiring different perspectives.

The undergraduate concentrations offered in rural sociology include sociology of agriculture and natural resources, rural and community development, international development, and social data and policy analysis. Requirements vary both in terms of the course requirements and in credit toward graduation (see details below).

All students majoring in rural sociology are expected to take an introductory course (101 or 102), one or more courses at the 200 level (205, 207, or 208) on selected topics, methods (213), theory (301), and a course in statistics.

The sociology of agriculture and natural resources provides an understanding of the biological, technological, and socioeconomic relationships that influence the organization, distribution, and control of natural resources, particularly in agricultural production. Agriculture represents a complex set of institutions around which natural resources, production, and social change can be investigated historically and contemporarily. Environmental sociology, the politics of land and water use, and the emerging biotechnologies represent other substantive foci around which a specialization can be structured. Students develop sophistication in the processes of social organization and change, where natural resources play a strategic role in economic production.

Students are encouraged to complement courses in the department with course work in history, economic change, and the policy sciences. Course selections in rural and community (regional) development, social data and policy analysis, and international development make appropriate complements.

Total credits required, including core courses: 45

Courses Required

<table>
<thead>
<tr>
<th>Course Required</th>
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</thead>
<tbody>
<tr>
<td>R Soc 206, Problems in Agriculture and Natural Resources</td>
<td>3</td>
</tr>
<tr>
<td>R Soc 324, Environment and Society</td>
<td>3</td>
</tr>
<tr>
<td>R Soc 405, Agriculture, Society, and Biotechnology</td>
<td>3</td>
</tr>
<tr>
<td>R Soc 445, Rural Social Stratification</td>
<td>3</td>
</tr>
</tbody>
</table>

Total credits required, including core courses: 45—48

Electives (at least 4 courses and 12 credits)

Courses in this category may be taken from the lists of any courses in the departments of Rural Sociology, Sociology, City and Regional Planning, and Human Service Studies in the United States; (2) the formulation of strategies for development in these settings; and (3) the implementation of development efforts in diverse communities. This specialization emphasizes the theory, methods, and applications of sociology as practiced in rural sectors of industrialized nations with emphasis on the United States. Students are urged to choose electives that contribute to these three aspects of development in nonmetropolitan settings. These electives include courses found in departments such as Sociology, Human Service Studies, City and Regional Planning, and Agricultural Economics.

Total credits required, including core courses: 45—48

Required Courses

<table>
<thead>
<tr>
<th>Course Required</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>R Soc 206, Problems in Rural and Community Development</td>
<td>3</td>
</tr>
<tr>
<td>R Soc 213, Social Indicators and Data Management</td>
<td>3</td>
</tr>
<tr>
<td>R Soc 356, Rural Society in America</td>
<td>3</td>
</tr>
<tr>
<td>R Soc 436, Small Communities: Structure and Change</td>
<td>3</td>
</tr>
<tr>
<td>R Soc 438, Community Development</td>
<td>3</td>
</tr>
</tbody>
</table>

Total credits required, including core courses: 18

Electives (at least 4 courses and 12 credits)

Courses in this category may be taken from the lists of any courses in the departments of Rural Sociology, Sociology, City and Regional Planning, and Human Service Studies in the United States; (2) the formulation of strategies to enhance the socioeconomic well-being of citizens of these countries.

The emphasis is on acquiring a broad background in the processes of social change and development in advanced and less developed countries, particularly in relation to agricultural and rural development. Students are urged to choose courses in development and social change and advanced courses in specific topics relevant to international development sociology, as well as electives in other disciplinary perspectives on international development (for example, agricultural economics, anthropology, and animal science).

Total credits required, including core courses: 12—14

Required Courses

<table>
<thead>
<tr>
<th>Course Required</th>
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</thead>
<tbody>
<tr>
<td>R Soc 205, Rural Sociology and International Agrarian Problems</td>
<td>3</td>
</tr>
<tr>
<td>R Soc 355, Rural Development and Cultural Change</td>
<td>3</td>
</tr>
<tr>
<td>R Soc 357, Subsistence Agriculture in Transition</td>
<td>3</td>
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</table>

Required Courses

<table>
<thead>
<tr>
<th>Course Required</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>R Soc 205, Rural Sociology and International Agrarian Problems</td>
<td>3</td>
</tr>
<tr>
<td>R Soc 355, Rural Development and Cultural Change</td>
<td>3</td>
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</table>

Total credits required, including core courses: 39

Required Courses

<table>
<thead>
<tr>
<th>Course Required</th>
<th>Credits</th>
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<tbody>
<tr>
<td>R Soc 205, Rural Sociology and International Agrarian Problems</td>
<td>3</td>
</tr>
<tr>
<td>R Soc 355, Rural Development and Cultural Change</td>
<td>3</td>
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</tbody>
</table>

Total credits required, including core courses: 39

Required Courses

<table>
<thead>
<tr>
<th>Course Required</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>R Soc 357, Subsistence Agriculture in Transition</td>
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</table>

Total credits required, including core courses: 39

Required Electives

<table>
<thead>
<tr>
<th>Course Required</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>R Soc 356, Rural Sociology in America</td>
<td>3</td>
</tr>
<tr>
<td>R Soc 405, Agriculture, Society, and Biotechnology</td>
<td>3</td>
</tr>
<tr>
<td>R Soc 432, Community Development</td>
<td>3</td>
</tr>
<tr>
<td>R Soc 445, Rural Social Stratification</td>
<td>3</td>
</tr>
<tr>
<td>Soc 378, Economics, Population, and Development</td>
<td>4</td>
</tr>
<tr>
<td>Soc 404, Human Fertility in Developing Nations</td>
<td>4</td>
</tr>
<tr>
<td>Soc 439, Social and Demographic Changes in Southeast Asia</td>
<td>4</td>
</tr>
<tr>
<td>C Art 624, Communication in Developing Nations</td>
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</table>

Total credits required, including core courses: 41—44

Required Courses

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<tbody>
<tr>
<td>Soc 201, Sociological Analysis or Soc 301, Evaluating Statistical Evidence</td>
<td>3</td>
</tr>
<tr>
<td>Soc 311, Primary Data Collection and Data Analysis or HSS 292, Research Design and Analysis or HSS 382, Survey Research Methods</td>
<td>3—4</td>
</tr>
<tr>
<td>Ag En 102, Introduction to Microcomputer Applications or Ag En 304, Introduction to Computing</td>
<td>3</td>
</tr>
<tr>
<td>R Soc/Soc 426, Policy Research</td>
<td>3—4</td>
</tr>
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</table>

Total credits required, including core courses: 12—14

Elective Courses

<table>
<thead>
<tr>
<th>Course Required</th>
<th>Credits</th>
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<tbody>
<tr>
<td>Econ 102, Introductory Macroeconomics or Ag Ec 150, Economics of Agricultural Geography</td>
<td>3—4</td>
</tr>
<tr>
<td>Soc 414, Population Policy or Soc 430, Social Demography</td>
<td>4</td>
</tr>
<tr>
<td>Soc 431, Techniques of Demographic Analysis</td>
<td>4</td>
</tr>
<tr>
<td>Gov 429, Government and Public Policy or HSS 460, Human Services Planning Methods</td>
<td>3—4</td>
</tr>
<tr>
<td>Phil 381, Philosophy of Science</td>
<td>4</td>
</tr>
</tbody>
</table>

Brochures are available from rural sociology faculty members.

Statistics and Biometry

Statistics is concerned with quantitative aspects of scientific investigation: design, measurement, and summarization, and the making of inferences. Biometry
is the application of mathematical and statistical techniques to the life sciences. Students with ability in mathematics and an interest in its applications will find this a challenging specialization.

The work of a statistician or biometrician can encompass research, teaching, consulting, and computing in almost any mix and in a wide variety of applications. Opportunities for employment are abundant in universities, in government, and in business and industry ranging from large corporations to small consulting firms, and salaries are usually excellent.

While satisfying course requirements for a specialization in statistics and biometry, students can also take a wide variety of courses in other disciplines. In fact, students are encouraged to take courses in applied disciplines such as agriculture, biology, economics, and the social sciences that involve numerical data and their interpretation.

Special Programs in Agriculture and Life Sciences

Some students are interested in pursuing a general education in the agricultural sciences. Others are uncertain about career objectives in agriculture and the life sciences. The opportunity to develop an independent major in general studies in agriculture and the life sciences is available for such students. In consultation with a faculty adviser, they may plan a sequence of courses suited to their individual interests, abilities, and objectives in an area not encompassed by the existing programs. Once the distribution and other college requirements are met, this major may include a concentration of courses in one or several academic units of the University.

Students completing this major are often planning a career in the agriculturally related food and service enterprises. Many of the fast-growing occupations of today are filled from each year’s graduating class.

Some students are interested in pursuing a general preparation in agricultural technology in a department of the college and (2) preparation in social sciences, communications, and program methodology. A limited number of cooperative extension agent positions are filled from each year’s graduating class.

Students desiring to prepare for extension careers in commercial agriculture will complete a two-part requirement.

1) Each student must complete 15 credits or more in oral communication, written communication, psychology, and sociology with at least one course in each area. Freshman Seminars may not be used to fulfill the written communication requirement. It is strongly suggested that students also complete the courses in education, particularly in curriculum development and adult education.

2) Students choose one of the specializations listed below and work with the adviser to schedule their course work. Each student must complete the requirements for a specialization.

Specialization

Adviser

Animal science and dairy production
R. Warner
Farm business management and finance
G. Casler
Field crops and soil science
D. Lathwell
Forrniculture and ornamental horticulture
G. Good
Pomology
G. Oberly
Vegetable crops
W. Kelley

Students who want to prepare for careers in 4-H program positions complete part 1, as outlined above, and are encouraged to concentrate on one or more areas of agricultural technology, but not necessarily at the level required for a specialization. Advisers are assigned as follows:

Plant sciences: E. Schaufler
All other areas: G. Broadwell

International agriculture

provides students with an understanding of the special problems of applying basic knowledge to the processes of agricultural modernization in low-income countries. The student typically specializes in a particular subject and works with an adviser to plan a program oriented toward international agriculture. The courses in international agriculture are designed to acquaint students with the socioeconomic factors in agricultural development, with the physical and biological nature of tropical crops and animals, and with various world areas for which study programs exist. The study of a foreign language is required.

In addition to the college distribution requirement, students majoring in international agriculture must take a minimum of 32 credits. A minimum of 5 credits in international agriculture is required for such students. In consultation with a faculty adviser, they may plan a sequence of courses suited to their individual interests, abilities, and objectives in an area not encompassed by the existing programs. Once the distribution and other college requirements are met, this major may include a concentration of courses in one or several academic units of the University.

Students completing this major are often planning a career in the agriculturally related food and service enterprises. Many of the fast-growing occupations of today are filled from each year’s graduating class.

Agricultural Economics


150 Economics of Agricultural Geography

Fall, 3 credits.

Lecs, M W F 11: 15 or 12: 20. 2 evening prelims. 5. G. Sisler.

The economics and geography of world agriculture, providing a basis for understanding past development and future changes. Elementary economic principles, historical development, physical geography, and population growth are studied in their relation to agricultural development and the economic problems of farmers. Where possible, current domestic and foreign agricultural issues are used to illustrate principles.

220 Introduction to Business Management

Fall, 3 credits.

Lecs, M W F 10:10 or 11:15. disc, M 2:30-4:25 or 7:30-9:25 p.m.; T 10:10-12:05, 12:20-2:15, 1-2:55, or 2:30-4:25; W 8-9:55, 10:-

12:05, 2:30-4:25; T 8-9:25 p.m.; R 8-9:55 or 10:00-12:05. 4-credit.
2:30–4:25. In weeks when discs are held, there will be no W lecture. Discs are held instead of a lecture in all but four weeks of the term. 2 evening prelims. R. D. Aplin.

Principles and tools useful in performing four major functions of management: planning, organizing, directing and leading, and controlling. Within this framework, consideration is given to social, legal, and economic environments; forms of business ownership; financial statements; cost behavior, and a few key concepts and tools in financial management.

221 Financial Accounting  Spring. 3 credits. Not open to freshmen. Lecs, M W F 11:15; lab, T W or R 9-10, 12:20–2:15, or 2:30–4:25, or W 2:30–4:25, or T W or R 12:20–2:15, or 2:30–4:25. In weeks labs are held, there will be no F lecture. G. A. German.

An introductory study of the food marketing system and the society it serves, including the goals and practices of producers and markets in such areas as buying and selling, grading, transporting, packaging, and advertising, price-making institutions (such as commodity futures markets), the behavior and purchasing practices of consumers, and the interrelationships among these groups.

302 Farm Business Management  Spring. 4 credits. Not open to freshmen. This course is a prerequisite for Agricultural Economics 402.


An introduction to the work problems associated with planning, organizing, operating, and managing a farm business, with emphasis on the tools of managerial analysis and decision making. Topics include management information systems, business analysis, budgeting, and acquisition, organization, and management of capital, labor, land, and machinery.

310 Introductory Statistics  Fall. 3 credits. Prerequisite: Education 115 or equivalent level of algebra.

Lecs, M W F 12:20, lab, M 2:30 or 3:35, T 2:30 or 3:35, or W 2:30 or 3:35. Evening exams. L. Gosele.

An introductory study of the economic concepts and techniques to be covered include the descriptive analysis of data, probability concepts and distributions, estimation and hypothesis testing, regression, correlation and time series analysis, and selected nonparametric methods. Applications from business, economics, and the biological sciences are used to illustrate the methods covered in the course.

320 Business Law  Fall. 3 credits. Limited to juniors, seniors, and graduate students.


Consideration is given chiefly to legal problems of particular interest to persons who expect to engage in business. Emphasis is on the law pertaining to personal property, contracts, agency, real property, and the landlord-tenant relationship.

321 Law of Business Associations  Spring. 2 credits. Limited to juniors, seniors, and graduate students. Prerequisite: Agricultural Economics 320 or permission of instructor. 321 and 420 may be taken concurrently.

Lecs, T R 2:30–4:30. 1 evening prelim. J. B. Bugliari.

The first portion of this course examines the formation and operation of business enterprises, particularly partnerships and corporations. The second portion of the course will review government regulations and controls of business and practices. Special attention will be given to the antitrust laws, consumer protection legislation, and environmental protection legislation.

322 Taxation in Business and Personal Decision Making  Spring. 3 credits. Recommended: background in accounting and business law.

Lecs, M W 2:30; disc to be arranged. D. A. D'Antoni.

The impact of taxation, both state and federal, on business and personal decision making. After a brief discussion of tax policy, an in-depth examination is conducted of federal income and estate and gift taxes affecting individuals and corporations. Both tax management and tax reportng are stressed.

323 Managerial Accounting  Fall. 3 credits. Prerequisite: Agricultural Economics 221.


An introductory to cost accounting that emphasizes the application of accounting concepts to managerial control and decision making. Major topics include basic costing, standard costing, cost behavior, cost allocation, pricing, budgeting, inventory control, variance analysis, measuring divisional performance, accounting for inflation, and accounting in the manufacturing environment.

324 Financial Management  Spring. 4 credits. Prerequisites: Agricultural Economics 220 or equivalent. Recommended: Agricultural Economics 221 and 310 or equivalents.


Focuses on three major questions facing management: how to evaluate capital investment decisions, how to raise the capital to finance those investments, and how to generate sufficient cash flows to meet the firm's cash obligations. Major topics include methods to analyze capital decisions, impulsa of taxes, techniques for handling risk and uncertainty, effects of inflation, sources and costs of debt and equity, capital structure, leverage, and working capital management. Microcomputers are used for analyzing financial problems. No previous computer experience is required.

322 Economics of the Public Sector  Fall. 3 credits. Prerequisite: Economics 101 or equivalent.


The application of economic concepts to evaluation of the structure and performance of the public sector, including the structure of agriculture, and domestic food subsidy programs.

351 Independent Honors Research in Social Science  Fall or spring. 1–6 credits. Limited to students who have met the requirements for the honors program. A maximum of 6 credits may be earned in the honors program.

402 Advanced Farm Management  Spring. 3 credits. Prerequisite: Agricultural Economics 402.


Emphasis is on the role of social and economic systems in shaping the nature and direction of agricultural production and marketing. Focus is on public policies and the impact of government actions on the private sector of agriculture.

405 Farm Finance  Fall. 3 credits. Prerequisite: Agricultural Economics 302.


The principles and practices used in financing an agricultural enterprise, including the management of working capital, short-term and long-term financing, and the costs associated with each type of financing. Emphasis is on factors affecting the choice of financing alternatives.

406 Farm and Rural Real Estate Appraisal  Fall. 3 credits. Limited to 45 students. Prerequisites: Agricultural Economics 302 or equivalent and permission of instructor.


The basic concepts and principles involved in appraising. Focus is on the valuation of farms and other agricultural land. The course includes the valuation of farm land and buildings, and the economic analysis of agricultural products.

407 Advanced Agricultural Finance Seminar  Spring. 2 credits. Limited to 16 students with extensive course work in farm management and farm finance. Open by application prior to March 1 of the year before the course is offered.

W 3:35–5:30. E. L. LaDue.

A seminar for graduate students in agricultural finance, conducted with financial support from the Farm Credit System. Includes two days at Farm Credit Banks of Springfield,
opportunities to analyze and evaluate actual farm circumstances in starting farming.

409 Farm Management Workshop Fall. 1 credit. Limited to seniors and graduate students. T 12:20-2. B. F. Stanton and staff. Presentation and interpretation of research in farm management and production economics. Participants conduct seminars reporting on research methodology and results obtained. Students prepare a summary and evaluation of a recent research publication during the semester.


412 Introduction to Linear Programming Spring. 3 credits. Primarily for juniors, seniors, and M.S. degree candidates. Prerequisite: Agricultural Economics 310 or equivalent. Lecs, M 10:10; lab, W 1:25–3:20 or 3:35–5:30. B. F. Stanton. An introduction to the concepts and computational procedures of linear programming. Emphasis on interpretation of results, model building, and data requirements for estimation using standard computer programs. Topics include: linear regression analysis, parametric programming, the transportation problem, scheduling, and distribution. Primary applications are made to agriculture and business using microcomputer software and mainframe packages.

415 Agricultural Prices Spring. 3 credits. Prerequisite: An introductory course in economics, such as Economics 101–102. S-U grades optional. Lecs, M W F 11:15. K. L. Robinson. An analysis of supply and demand characteristics of farm commodities, institutional aspects of pricing farm and food products, temporal and spatial price relationships, price forecasting, and the economic consequences of pricing decisions.

416 Introduction to Econometrics Spring. 3 credits. Prerequisite: Agricultural Economics 310 or equivalent. Recommended: Agricultural Economics 415. Lecs, T R 10:10–11:25. D. R. Lee. The course introduces students to basic econometric principles and the procedures used in empirical studies of demand, supply, and price behavior. Assumptions, properties, and problems encountered in the estimation of linear and non-linear regression model are discussed. Applications to agricultural product markets are emphasized. Students are required to specify, estimate, and report on an empirical model.

418 Information Systems and Decision Analysis Spring. 3 credits. Prerequisites: Computer Science 102 or Agricultural Engineering 102 or equivalents, Economics 101 or equivalent, and Agricultural Economics 310. Lecs, T R 11:15; disc to be arranged. D. Streeter. This course builds knowledge of decision theory and how to apply it in a business setting. The emphasis will be on computer-aided information systems that use the various techniques of decision analysis: decision support systems, simulation, queuing theory, and techniques for handling risk and uncertainty.

420 Advanced Business Law Spring. 3 credits. Limited to juniors, seniors, and graduate students. Lecs, T R 8:30–9:55. One evening prelim. B. J. Bugliari. Designed to provide a fairly detailed and comprehensive legal background in areas of commercial law affecting the operation of business enterprises. Particular consideration is given to the law pertaining to bailments, sales, secured transactions, bankruptcy, and commercial paper.

422 Estate Planning Fall. 1 credit. Limited to upperclass students. S-U grades only. Lec, M 4. J. B. Bugliari. Fourteen sessions on the various aspects of estate-planning techniques. The law and use of trusts, the law of赠与, and the use of life insurance are discussed. Emphasis is on probate-related issues.

424 Business Policy Spring. 3 credits. Limited to seniors majoring in business management and marketing. T R 9:05–10:35, 11:05–12:35, or 2:30–4. R. D. Aplin. An integrated course that examines business ethics policy formulation and implementation from the standpoint of the general manager of an organization, focusing on decision making at the top management level. The course is built around a series of cases. Several guest executives. Emphasizes improving oral and written communication skills.

426 Cooperative Management Fall. 3 credits. Recommended: Agricultural Economics 220 or equivalent. Lecs, M W F 11:15. Evening prelim. B. L. Anderson. Investigates the unique aspects of cooperative business organizations. Topics are approached from the point of view of management and the board of directors and members, and include cooperative principles, management decision making, legislation, financing, taxation, and marketing practices of cooperatives attempt to handle. Primary focus is on operating cooperatives in agriculture, but an examination of informal group action, bargaining cooperatives, marketing orders, and marketing boards is also included.

430 Agricultural Trade Policy Fall. 3 credits. Primarily for seniors and M.S. degree candidates. Prerequisites: Agricultural Economics 351 and either Agricultural Economics 415 or Economics 311. Lecs, T R 11:15; lec or disc, M or W 3:35. D. Blandford. An examination of the rationale and method of commodity trade policy. The course analyzes problems and issues in both developed and less-developed countries and deals with the major questions associated with the organization of international commodity markets.

441 Personal Enterprise and Small Business Management Spring. 2 credits. Limited to seniors. Prerequisites: Agricultural Economics 220, 221, and 240. Lecs, M W F 11:05 or 2:30. Staff. Designed to give students with the role of small business in the American economy. Special emphasis on the problems related to starting a new business, including financing strategic planning, staffing, marketing, and managing growth. The term project will be group development of a business plan. Visiting entrepreneurs will illustrate a variety of business formats.

443 Food-industry Management Spring. 4 credits. Limited to juniors and seniors. Prerequisite: Agricultural Economics 240. Lecs, T R 9:05–10:35; sec, R 2–3:30. G. A. German. A case-study approach is used to examine the application of management principles and concepts to marketing and distribution problems of the food industry. Cases covering new product introductions, merchandising strategies, and investment decisions are included. Guest speakers from the food industry present case-study solutions at the Thursday session.

448 Food Merchandising Fall. 3 credits. Limited to seniors. Prerequisite: Agricultural Economics 240. Lecs, T R 10:10–11:25. E. M. Cahall. Merchandising practices and principles as they apply to food industry situations. The various elements of merchandising are examined, including buying, pricing, advertising, promotion, display, store layout, profit planning and control, and merchandising strategy. The consequences of food industry trends and initiatives for other industry members, public policymakers, and consumers are considered.

449 Applications in Strategic Marketing Fall. 2 credits. Prerequisite: Agricultural Economics 343. Recommended: prior enrollment or concurrent registration, or permission of instructor. Cost of field trips, approximately $250. W 2:30–4. Two 1-day field trips to the upstate area and a 3-day trip to the New York City area during intersession just prior to registration (Jan. 18–21, 1997). Grades are not registered until February. E. M. Cahall. Focuses on the major components of strategic marketing: product mix, distribution, pricing, advertising and promotion, and market research. Students are given firsthand exposure to a wide range of marketing strategies through field trips, guest lectures, case studies, a simulated marketing game, and development of a strategic marketing plan.

450 Evaluating Resource Investment Spring. 3 or 4 credits. Primarily for juniors and seniors. Prerequisite: an introductory course in economics, a 300-level agricultural economics course, or permission of instructor. M 1:25–4:25; disc to be arranged. D. J. Allee. Means of reaching decisions on environmental questions. Concepts of social value and cost-benefit analysis, determination of degrees of importance of environmental problems and priorities. Topics include: environmental quality, questions of political economy, and public project and program applications.

451 Energy Resources and Energy Corporations Spring. 3 credits. Prerequisite: preparation in elementary economics or quantitative analysis. Lecs, M W F 11:15. D. Chapman. The course introduces students to methods of economic analysis used in business and in government agencies. In part of the course students use microcomputer models to examine corporate and public policy. The topics addressed include investment criteria in energy production use, regulatory methods for rate determination for utilities; industry structure, and production costs and demand for petroleum, natural gas, electricity, nuclear power, coal, and solar and renewable energy. Also, the economic significance of pollution-control costs and energy for U.S. manufacturing and trade is studied.

455 Agricultural Law Spring. 3 credits. Limited to juniors, seniors, and graduate students. Prerequisites: Agricultural Economics 302 and 320 or equivalents or permission of instructor. Lecs, M W F 10. 10. D. Grossman. Law and government regulation as it applies to agriculture and the use of land for agricultural production. An overview of federal and state laws, legal issues in natural resources and farm bias, agricultural policy, agricultural marketing, cooperative, employment, soil and water management, farm lands preservation and use, and ownership of animals.
464 Economics of Agricultural Development Spring. 4 credits. Prerequisites: Agricultural Economics 150, Economics 101-102, or permission of instructor.
An examination of the processes of agricultural development in Third World nations and their interactions with United States policy. Agricultural and rural development policy, the interdependence of agriculture with other sectors, alternative forms of agricultural organization, food security, and related policies tending to alleviate highly concentrated income distributions are all emphasized.

499 Undergraduate Research Fall or spring. 1-4 credits. Limited to seniors with grade-point averages of at least 2.7. Prerequisite: written permission of the staff member who will supervise the work and assign the grade; this permission must be attached to course enrollment material. S-U grate optional.
Permits outstanding undergraduates to carry out independent study of suitable problems under appropriate supervision.

605 Agricultural Finance and Capital Management Fall. 3 credits. Prerequisites: Agricultural Economics 402 or 405, or equivalent.
Offered alternate years.
T R 8:40-9:55. J. Brake, L. Tauer, E. LaDue.
Advanced topics in management and financing of agriculture. Special emphasis on current issues. Example topics: farm-sector funds flows, financial risk and decision analysis, agricultural finance policy, financial intermediation and intermediairies, firm growth, inflation, investment-replacement models, and selected topics on financing agriculture in developing countries.

608 Production Economics Fall. 3 credits. Prerequisite: Economics 311 or equivalent. Recommended: Mathematics 108 or 111 or equivalent.
Lecs, M W F 10-10. L. W. Tauer.
The theory of production economics with emphasis on applications to agriculture. Topics include the derivation, estimation, and use of production, cost, profit, demand, and supply functions. Production response over time and under risk is introduced.

640 Analysis of Agricultural Markets Fall, weeks 1-7. 2 credits. Prerequisites: Agricultural Economics 415 and 416 or equivalents.
This course is about markets for agricultural products: their distinguishing characteristics, criteria for evaluating performance, models of price determination, farm-retail marketing margins, and selected public-policy issues related to market performance. Agricultural Economics 641, 740, and 91 cover additional dimensions of agricultural markets.

641 Time in Agricultural Markets Fall, weeks 7-14. 2 credits. Prerequisites: Agricultural Economics 415 and 416 or equivalents. Recommended: Agricultural Economics 640.
This course is primarily about markets for agricultural futures contracts. Emphasis is placed on price behavior on cash and futures markets and the relationships among prices. These principles provide a foundation for a discussion of hedging, speculation, and public-policy issues.

643 Export Marketing Fall. 3 credits. Prerequisite: permission of instructor. Estimated cost of field trip, $100.
Lec, R 2:30-4:45. Overnight field trip to New York City required.
The history and development of commercial United States exports of agricultural commodities and the mechanics and procedures of exporting. Alternatives in sales contracts, shipping, insurance, financing, business structure, researching markets, and promotion. Trading experiences of specific commodity specialists.

651 Economics of Resource Use Fall. 4 credits.
Lec-sem, F 1:30-4:30. D. Chapman.

652 Special Problems in Land Economics Fall or spring. 1 or more credits. Limited to graduate students. Prerequisite: permission of instructor. S-U grades optional.
Hours to be arranged. D. J. Allee.
Special work on any subject in the field of land economics.

660 Food, Population, and Employment Fall. 5 credits. Enrollment limited to 16 to ensure that students have an opportunity to work individually with instructor.
M W 2:30-4:30 and an individual weekly meeting with the instructor. T. T. Poleman.
Examines the links between food consumption, food, and population growth in less-developed countries. Food economics and the world food situation are treated as cornerstones and examined in historical perspective. Requires a major term paper.

661 Food, Population, and Employment II Spring. 1-3 credits. Prerequisite: permission of instructor.
Individual weekly meeting with the instructor. T. T. Poleman.
Individual, guided research for students who want to carry on with projects initiated in Agricultural Economics 660 or to undertake new ones.

663 Macroeconomic Issues in Agricultural Development Fall. 3 credits. Prerequisite: permission of instructor. S-U grades optional. Offered alternate years. Not offered 1986-87.
Lec to be arranged. E. Thorbecke.
Issues such as the role of agriculture in economic development, the household farm as producing and consuming unit, operation of product and factor markets in agricultural and rural areas, structural transformation of agriculture in the process of economic development, theories of agricultural development, and agricultural and rural development strategies and models. The approach followed is theoretical, quantitative, and empirical.

664 Microeconomic Issues in Agricultural Development Spring. 3 credits. Prerequisite: Agricultural Economics 608, Economics 311, or permission of instructor. S-U grades optional.
T R 11:15-12:30. R. Barker.
Issues such as production efficiency, induced technological change, allocation of research resources, and the distribution of benefits from new technology are discussed. The theoretical argument is related to applied research problems.

665 Seminar on Latin American Agricultural Policy Fall. 3 credits. Prerequisite: Agricultural Economics 464 or work in Latin American economic and social development. Offered alternate years. Not offered 1986-87.
An examination of policies for the development of the agricultural sector in Latin America, including an identification of policy objectives and a review of the instruments of policy Implementation. Particular attention is paid to the interactions of agrarian structure, agricultural productivity, and rural welfare.

699 M.P.S. Research 1-6 credits. Prerequisite: registration as an M.P.S. student. Credit is granted for the M.P.S. project report.

700 Topics in Agricultural Economics Fall or spring. Limited to graduate students. Credit, class hours, and other details arranged with a faculty member.
This course is used to offer special topics in agricultural economics not regularly included in regular class offerings. More than one topic may be given each semester in different sections. The student must register in the section appropriate to the topic being covered; the section number is provided by the instructor.

708 Advanced Production Economics Fall. 3 credits. Prerequisites: Agricultural Economics 608, 710, or equivalents. Offered alternate years.
Hours to be arranged. R. N. Boliver.
Theoretical and mathematical development in production economics, with emphasis on estimating micro-production function and market relations, factor substitution, scale economies, technical change, factor substitution, and recently developed functional forms. Discussions of several other selected topics such as risk, supply response, and household production functions change from year to year based on student interest.

710 Econometrics I Spring. 4 credits. Not open to undergraduates. Prerequisites: Statistics 416 and 601 or equivalent.
Lecs, T R 2:30-4:25. W. G. Tomek.
This course covers basic topics in econometrics at an intermediate level, requiring the background required in regular classes. More than one topic may be given each semester in different sections. The student must register in the section appropriate to the topic being covered; the section number is provided by the instructor.

711 Econometrics II Fall. 4 credits. Prerequisite: Agricultural Economics 710 or equivalent. Statistics 417 recommended.
Coverage beyond that of Agricultural Economics 710 of generalized least squares, testing linear hypotheses, the effects of specification errors, and regression diagnostics. Applications include seemingly unrelated estimators, continuing with topics such as specification error and autocorrelated residuals, and concluding with simultaneous equations estimators. The content is designed for Ph.D. students who will be doing empirical research as applied economists.

712 Quantitative Methods I Fall. 4 credits. Prerequisite: Statistics 416 or equivalent. Recommended: Statistics 417.
Lecs, M W F 11:15. R. N. Boliver.
A comprehensive treatment of linear programming and its extensions, including postoptimality analysis, goal programming, and the Dantzig transportation model. Special topics in nonlinear programming, including separable, spatial equilibrium and risk programming models. Input-output models are discussed when time permits. Applications are made to agricultural, resource, and regional economic problems.

713 Quantitative Methods II Spring. 4 credits. Prerequisites: Economics 509 and Agricultural Economics 710.
This course is concerned with the analysis and optimization of dynamic systems. Course objectives are to (1) present the basic theory of dynamical
systems and dynamic optimization, (2) introduce
assessed methods and econometric
analysis, (3) review some applications of dynamic
analysis from various subfields in economics, and
thereby (4) equip the student with basic theory and
methods to perform applied research on dynamic
allocation problems.

717 Research Methods in Agricultural Economics
Spring. 2 credits. Limited to graduate students.
Discussion of the research process and scientific
method as applied in agricultural economics. Topics
include problem identification, hypotheses, sources of
data, sampling concepts and designs, methods of
collecting data, questionnaire design and testing, field
organization, and analysis of data. During the semester
each student develops a research proposal that may be
associated with his or her thesis.

730 Seminar on Agricultural Trade Policy
Spring. 3 credits. Limited to graduate students.
Prerequisites: Agricultural Economics 430 and basic familiarity with
A discussion of selected topics in agricultural trade
policy, such as the linkage between domestic agricultural
development and market stability and market
stabilization, and agricultural trade and development.
The preparation of a term paper is an important part of
the course.

400 Agricultural Markets and Public Policy
Spring, weeks 1–7. 2 credits. Limited to graduate
students. Prerequisite: familiarity with multiple
regression techniques on the level of Statistics and
Biometry 601. Recommended: Agricultural Economics 640.
A discussion of selected topics in agricultural trade
policy, such as the linkage between domestic agricultural
and international commodity models, and macroeconomic
analysis from various subfields in economics, and
the social setting. The seminar provides an
overview of the social setting. The seminar provides an
opportunity to examine systematically the institutional and
organizational policy issues associated with the
development and operation of systems of irrigated
agriculture.

Agricultural Engineering

G. E. Rehkugler, chairman; L. D. Albright,
M. J. Aneshesney, J. A. Barthsch, J. K. Campbell,
T. Cook, J. R. Conreul, T. C. Gremereheid,
R. W. Guest, W. W. Gunkel, D. A. Hailt, P. E. Hillman,
J. B. Hunter, W. W. Irish, L. H. Irwin, W. J. Jewell,
R. K. Koelsch, H. A. Longhouse, D. C. Ludington,
T. G. Miller, W. F. Miller, D. J. Parlanhe, R. E. Pitt,
T. S. Steenhus, M. B. Timmons, L. P. Walker,
M. F. Walter

102 Introduction to Microcomputer Applications
(also Computer Science 102) Fall. 3 credits. Each
lab section limited to 16 students. Not open to students
enrolled in the College of Engineering or to students
who have taken any prior computer courses at Cornell.
Students in Statutory Colleges must enroll in
Agricultural Engineering 102.
Lec, T 2:25; rec, F 9:05, 10:10, or 11:15, lab, M
12:20–1:25, 2:30–4:25, or 3:30–9:25 p.m., or T
10:10–12:05 or 12:20–2:15, or W 2:30–4:25, 7:30–
9:25 p.m., or R 10:10–12:05. 2 evening prelims.
P. E. Hillman and computer science staff.
An introduction to the use of application packages on
microcomputers. An attempt will be made to assess and
demonstrate the capabilities and limitations of the
current generation of personal computers through
software for word processing, spreadsheets, database,
and other applications. The course will cover very
lightweight applications using high-level languages.

110 Farm Metal Work Fall or spring. 2 credits.
Lec, T 9:05; labs, (fall) M or T 1:25–4:25, (spring) M
or T 1:25–4:25; T. J. Cook.
Lec, M lab, limited to 24 students, includes instruction in
the fundamentals of metal lathe work and arc
and acetylene welding, T and R labs, each limited to 20
students, include instruction in sheet metal work, plate
fitting, hot and cold metal work, and arc and acetylene
welding.

132 Farm Carpentry Fall or spring. 2 credits. Each lab limited to
15 students.
Lec, T 9:05; labs, W or R 1:25–4:25.
H. A. Longhouse.
Instruction in the fundamentals of farm carpentry,
including concrete work, and equipment and buildings
constructed of wood. Each student is required to plan
and construct an approved carpentry project.

151 Introduction to Computing in Agricultural
Engineering Fall. 3 credits. Prerequisite: one term of
calculus or concurrent registration in a calculus
course.
Lec, T 1:25; labs, W or F 12:20–2:10, 2:25–4:30.
J. R. Cooke.
This course provides an introduction to computing
using IBM/PC/XT microcomputers. The structured
programming language Pascal will be covered using
agricultural engineering and related topics.

152 Computing with Graphics Spring. 3 credits.
Prerequisite: Agricultural Engineering 151.
Lec, T 1:25; lab, F 1:25–3:20; R. B. Fury.
An introduction to digital computing using the
FORTRAN language with applications to engineering
graphics.

153 Engineering Drawing Fall. 2 credits. Limited to
72 students (36 in each lab).
Lec, M 9:05; lab, M or T 1:25–4:25.
H. A. Longhouse.
Design to promote an understanding of the
engineer's universal graphic language. The lectures and
laboratories develop working knowledge of drawing
conventions, drafting techniques, and their application
to machine and pictorial drawing problems. The course
will involve both instrument and AutoCAD computer
drawings.

200 Undergraduate Seminar Spring. 1 credit.
S-U grades optional.
A forum to discuss the contemporary and future role
of agricultural engineering in society. A series of lectures
will be given by practicing agricultural engineers,
Cornell faculty members, and students. Written
critiques are required. Students may take the seminar
more than once but are limited to 2 credits maximum.

204 Introduction to Computer Uses Spring. 4
credits. Each lab section limited to 20 students. S-U
grades optional.
Lecs, T 9:15; lab, W or R 1:25–2:15, 2:30–3:20, or
An introductory course in computing for those
interested in using microcomputers to handle data.
Topics include preparing and processing computer
programs in Pascal and FORTRAN. No prior knowledge
of computers or computer languages is necessary.

208 Application of Physical Sciences I Fall.
3 credits. Prerequisite: a term of calculus and high
school physics or a year of college physics.
The application of statics, dynamics, mechanics of
elements, and fluid mechanics to physical problems in
agriculture. Topics include torque, free-body diagrams,
friction, energy, stress, bending, shear, fluid flow, and
wall pressures. Emphasis is on problem solving.

209 Application of Physical Sciences II Spring.
3 credits. Prerequisite: Agricultural Engineering 208.
A continuation of Agricultural Engineering 208. The
laws of thermodynamics and principles of energy
transfer, psychrometrics, and electricity are covered.
Topics include applications in agriculture of the various
gas and vapor cycles used in engines and refrigeration,
heat conduction through multiple layers, convection,
thermal conductivity, and other applications. Solving practical problems is emphasized.

221 Plane Surveying Fall or spring. 3 credits.
S-U grades optional.
Principles and practice of measurement of distance,
elevation, and direction. Use and care of equipment
are stressed during field trips. Computer-aided mapping,
environmental design, and construction. Other topics
include surveying specifications, standards of accuracy, and business and professional practices.

250 Engineering Applications in Biological Systems
Spring. 3 credits. Prerequisite: enrollment in an
engineering curriculum. Recommended for the
senior year.
Lec, M 1:25–2:10, R. E. Pitt.
Case studies of engineering problems in agricultural
and biological systems, including animal and crop
production, environmental control, energy, and food
engineering. Emphasis is on the application of
mathematics, physics, the engineering sciences, and
biology to energy and mass balances in agricultural
systems.

301 Introduction to Energy Technology Fall.
3 credits. Prerequisite: high school or college
physics: or Agricultural Engineering 208 and 209.
S-U grades optional. Offered alternate years. Not
offered Fall 1986.
Basic concepts of energy transfer and traditional and
alternative sources of energy. Design of small systems
and appropriate technology are emphasized. Topics

An interdisciplinary course intended to introduce students to the general principles of soil and water interaction and to the effects of human intervention in these processes. Aspects of soil and water management, including hydrology, soil erosion, irrigation, drainage, and water quality are examined.

331 Farmstead Production Systems Fall. 3 credits. S-U grades optional. Lecs, T R 11:15; M. K. G. Gebremedhin. A study of layout and functional planning and design of farmstead production systems. Material handling, properties, selection, and use of building materials are discussed. Production environment, regulation and control, evaluation of use and efficiencies of farm buildings are included. Systems approach to agricultural production is emphasized.

332 Farm Buildings Design Fall. 2 credits. Intended for students without backgrounds in statics or properties of structural materials.

371 Soil and Water I: Hydrology, Erosion, and Chemical Movement in the Landscape Fall. 3 credits. Prerequisite: knowledge of soils, one semester of computer programming, and one year of calculus.

401 Career Development in Agricultural Engineering Fall. 1 credit. Limited to seniors. S-U grades only.

420 Introduction to Marine Pollution and Its Control Summer 2 credits. Prerequisite: Biological Sciences 364 or permission of instructor. A special 2-week course offered at Cornell’s Shoals Marine Laboratory. For more details and application, consult the SML office, G14 Stimson Hall. Estimated cost (includes tuition, room and board, and ferry transportation), $590.

451 Energy Systems Engineering Spring. 3 credits. Prerequisite: Agricultural Engineering 250, Mathematics 294, and thermodynamics.

461 Agricultural Machinery Design Fall. 3 credits. Prerequisite: mechanical design or equivalent.

462 Tractors and Power Units for Agriculture Spring. 3 credits. Prerequisites: engineering dynamics, thermodynamics, and Agricultural Engineering 250.

475 Environmental Systems Analysis Fall. 3 credits. Prerequisite: computer programming and one year of calculus.

481 Agricultural Structures Design Fall. 3 credits. Prerequisite: Civil and Environmental Engineering 371, or permission of instructor.

482 Environmental Control for Animals and Plants Spring. 3 credits. Prerequisite: Agricultural Engineering 250 or equivalent, and fluid mechanics.

491 Highway Engineering (also Civil and Environmental Engineering) Spring. 3 credits. Prerequisite: junior standing in engineering, fluid mechanics and soil mechanics (may be taken concurrently).
672 Drainage Spring. 4 credits. Prerequisites: Agricultural Engineering 371. Consent of instructor. The physics of groundwater flow with specific reference to tile drainage. Critical review of benefits of drainage as well as a thorough analysis of the design of the drainage systems. Effects of drainage on water quality will be discussed. Laboratories are used to measure physical parameters used in drainage designs.

673 Irrigation Systems Spring. 3 credits. Prerequisite: permission of instructor. An introduction to the design and implementation of irrigation that uses a systems perspective to put the different aspects of irrigation into context. Topics include systems planning and appraisal, irrigation structures, and methods of flexible and rigid pavements; design for frost conditions; and pavement evaluation using nondestructive test methods.

677 Treatment and Disposal of Agricultural Wastes Fall. 3 credits. Prerequisite: permission of instructor. 3 lecs., hours to be arranged. Staff. Emphasis is on the causes of agricultural waste problems and the application of fundamentals of treatment and control methods to minimize pollution. Functional, physical, and chemical pollution control methods are applied to animal, food production, and food-and-fiber-processing wastes, using actual systems as examples.

678 Non-Point Source Models Spring. 3 credits. Prerequisites: Computer programming and calculus. Recommended: previous course work in hydrology or soil and water engineering. Lecs., M W F 11:15. D. H. Hail. Development and programming of simulation models for management of water pollution from runoff and percolation. Emphasis is on prediction of water and chemical inputs to surface waters and groundwater. Applications include urban and rural runoff, lake eutrophication, groundwater waste loadings from land disposal sites, pesticides and nutrients in agricultural drainage, irrigation return flows, and watershed stream flow and sediment yield.

679 Use of Land for Waste Treatment and Retention Fall. 3 credits. Prerequisite: permission of instructor. Lecs., T R 3:35–4:50. W. J. Jewell. Covers the social, legal, and technical factors; the properties of land and contribution the application of wastes a viable alternative; and the use of fundamentals in the development of regulations and the design of full-scale units.

682 Building Environment Control Fall. 3 credits. Prerequisite: one course in building environment control and a course in heat transfer. Offered alternate years. Not offered 1986–87. Staff. Hours to be arranged. L. D. Albright. Topics include thermal interactions of animals and plants with their environments, time-dependent thermal modeling of buildings, natural ventilation processes in buildings, sensors and controllers, and psychrometric processes.

685 Biological Engineering Analysis Spring. 4 credits. Prerequisites: Theoretical and Applied Mechanics 310 or permission of instructor. M W F 12:20. J. R. Cooke. Engineering problem-solving strategies and techniques are explored. Students solve several representative engineering problems that inherently involve biological properties. Emphasis is placed upon formulation and solution of mathematical models and the interpretation of results. The student’s knowledge of fundamental principles is used extensively.

692 Highway Materials and Pavement Design (also Civil Engineering 643) Fall. 4 credits. Limited to engineering seniors and graduate students. Prerequisite: one introductory course in soil mechanics or highway engineering. Offered alternate years. Staff. Hours to be arranged. L. H. Irwin. Application of geotechnical engineering principles to the selection of materials and design of highway and airfield pavements. Laboratory will provide experience with materials testing, asphalt concrete mix design, and chemical soil stabilization. Topics of discussion will include properties of asphalt, aggregates, and bituminous mixture design; base courses and soil stabilization methods; design of flexible and rigid pavements; design for frost conditions; and pavement evaluation using nondestructive test methods.

501–502 M.P.S. Project Fall and spring. 6 credits. Required of each M.P.S. candidate in the field. Hours to be arranged. Staff. A comprehensive project emphasizing the application of agricultural technology to the solution of a real problem.

551–552 Agricultural Engineering Design Project Fall and spring. 6 credits. Prerequisite: admission to the M.Eng.(Agr.) degree program or equivalent preparation. Hours to be arranged. M. F. Walter and staff. Comprehensive design projects dealing with existing engineering problems in the field. Emphasis is on the formulation of alternative design proposals that include consideration of economics, nontechnical factors, engineering analysis, and complete design for the best design solution.

652 Instrumentation Spring. 4 credits. Prerequisites: Mathematics 294, Physics 213, Electrical Engineering 210, and Biological Sciences 109–110, or permission of instructor. Lecs., T R 12:20–1:35; lab to be arranged. D. J. Aneshansley. Application of instrumentation concepts and systems to the measurement and control of environmental and biological parameters. Instrument characterization, signal-conditioning techniques and related electronic circuits, circuits for signal amplification and data storage, characterization, and data acquisition and control with personal computers are topics considered. A final design project is required; the design, construction, and evaluation of an instrument and/or control system. Intended for seniors and first-year graduate students.

655 Thermodynamics and Its Applications Spring. 3 credits. Prerequisite: Mathematics 293 or equivalent. Lecs., M W F 12:20–1:35; J. Y. Parliang. Thermodynamics and its applications to problems in engineering and agriculture. Topics include basic concepts (equilibrium, entropy, processes, systems, potentials, stability, phase transitions) and applications (soil and water processes, dilute solutions, electromagnetism, surface phenomena, heat and mass transport, structure of organizations).

671 Analysis of the Flow of Water and Chemicals In Soils Fall. 3 credits. Prerequisites: two calculus courses and fluid mechanics. Lecs. to be arranged. J-Y Parliang, T. S. Steenhuis. The course encompasses the full range from simple to complex ways to describe the chemical and water flows on the surface, in the vadose zone, and through the aquifer. Current analytical, semi-analytical, and computer-based techniques are discussed. Both homogeneous and heterogeneous flows are analyzed.
A comprehensive introduction to the field of soil science, with emphasis on scientific principles and their application in solutions of practical soil management problems.

311 Grain Crops Fall. 4 credits. Prerequisite: Agronomy 260 or Biological Sciences 241. Lecs. M W F 10-10; lab, M T or W 1 25-4 25. R. B. Bryant. The soil as a natural body. Factors and processes of soil formation. Principles of field identification, classification, survey, and interpretation. Geographic of major kinds of soil of North America and the world in relation to environment and cultural patterns. Laboratory exercises and field trips assist in interpreting 312 Forage Crops Spring. 4 credits. Prerequisites: Agronomy 260 or Biological Sciences 241. Recommended: Animal Science 112. Lecs. M W F 11-15; lab, M T or W 1-2 4-25. G. W. Fick. The production and management of crops used for livestock feed are considered in terms of establishment, growth, maintenance, harvesting, and preservation. Forage grasses, forage legumes, and corn are emphasized, and considered is given to their value as livestock feed in terms of energy, protein, and other nutritional components.

314 Production of Tropical Crops Spring. 3 credits. Prerequisite: a course in crop production. Lecs. M W F 10-10. M. J. Wright. An introduction to the characteristics and culture of the principal food staple crops of the tropics and sub tropics and of some of the crops grown for export. Vegetables and fruits are not emphasized.

315 Weed Science Fall. 3 credits. Prerequisites: Agronomy 260, and Biological Sciences 103 or 104 and Biological Sciences 241. Lecs. T R 8; lab, M T or W 2-4 25. W. B. Duke. Principles of weed science are examined. Emphasis is given to (a) weed ecology, (b) chemistry of herbicides in relation to effects on plant growth, and (c) control of weeds in all crops. Laboratory covers weed identification, herbicide selectivity, herbicide injury symptoms, and farm herbicide problem solving.

317 Seed Science and Technology Fall. 3 credits. Prerequisite: Biological Sciences 241 or equivalent. Offered alternate years. Not offered 1986-87. Lecs. T R 11-15; lab, R 1-25-4 25; 1 all-day field trip required. A. G. Taylor, Geneva Experiment Station. (Ithaca contact, R. L. Obendorf.) The principles and practices involved in the production, harvesting, processing, storage, testing, quality management, certification, and use of high-quality seed from improved cultivars. Information is applicable to various kinds of agricultural seeds.

334 Agricultural Meteorology Spring. 3 credits. T R 10-11. W. B. Duke. An introduction to the relationships of radiant energy, temperature, wind, and atmospheric pressure to soil temperature. Hours to be arranged. Staff. The student becomes acquainted with facsimile, teletype, and satellite receiving equipment and computer graphics become the basis for a term project.

361 Genesis, Classification, and Geography of Soils Fall. 4 credits. Prerequisite: Agronomy 260 or consent of instructor. S-U grades optional. Lecs. M W F 10-10; lab, W 1-2 4-25; all-day field trip required. R. B. Bryant. The soil as a natural body. Factors and processes of soil formation. Principles field identification, classification, survey, and interpretation. Geography of major kinds of soil of North America and the world in relation to environment and cultural patterns. Laboratory exercises and field trips assist in identifying and interpreting soils in relation to landscape.

362 Soil Morphology Fall. 1 credit. Recommended for sophomores and juniors. Prerequisite: permission of instructor. R 1-25-4 25; all-day field trip required. R. B. Bryant. The principles for field identification of soil properties, profiles, and landforms are presented. A series of soil pits are examined, described, classified, and interpreted in the field.


372 Soil Fertility Management Fall. 3 credits. Prerequisite: Agronomy 260 or permission of instructor. M W F 9-9.5. D. R. Boulin. An integrated discussion of soil-crop yield relationships, with emphasis on the soil as a source of mineral nutrients for crops and the role of fertilizers and manure in crop production.

373 Aquatic Plant Management Fall. 3 credits. Prerequisites: Biological Sciences 101-102 and Chemistry 103-104 or equivalents. R. F. Lucey; M W F 11-15; T 1-25-4 25. J. H. Pevery. The chemistry and physiology of higher aquatic plants is studied, with emphasis on their solenol and physical processes. The student becomes acquainted with facsimile, teletype, and satellite receiving equipment and computer graphics become the basis for a term project.

411-442 Theoretical Meteorology I and II Fall, 442; spring, 3 credits each semester. Prerequisite: a year each of calculus and physics. M W F 10-10. W. W. Knapp. Fall semester topics include thermodynamics of dry air, water vapor and moist air, hydrostatics and stability. Topics considered in the spring term include meteorological coordinate systems, variation of wind and pressure fields in the vertical, winds in the planetary boundary layer, surfaces of discontinuity, and mechanisms of pressure change, and vorticity and circulation.

441 Physical Meteorology Fall. 3 credits. Prerequisite: a year each of calculus and physics. Offered alternate years. M W F 12-20. W. W. Knapp. Primarily a survey of natural phenomena of the atmosphere, with emphasis on their solenol and physical principles. Topics include composition and structure of the atmosphere, atmospheric optics, acoustics and electricity, solar and terrestrial radiation, and principles of radar probing of the atmosphere.

451 Synoptic I Fall. 4 credits. Prerequisites: Agronomy 441 and 442, or permission of instructor. Lecs. T R 9-9.5; lab, M T 1-3-3 20. D. A. Paine. The mathematical basis of quasi-geostrophic theory as a diagnostic and forecast methodology. Isentropic theory and analysis applied to a classic case of cyclogenesis. Special emphasis given to the prediction of severe local storms.

452 Synoptic II Spring. 4 credits. Prerequisite: Agronomy 450 or permission of instructor. Lecs. T R 10-10; lab, M 1-25-3 20. D. A. Paine. A practicum in the history of numerical weather prediction. The current and future status of computer guidance in meteorology. Students prepare data run a variety of storm situations. Model-generated computer graphics become the basis for a term project.

454 Biometeorology Spring. 2 credits. Prerequisite: permission of instructor. Lecs. T 1-25; disc, R 1-25-3 20. D. A. Paine. How will the atmosphere and oceans respond to an increase of carbon dioxide, depletion of ozone, or onset of a "nuclear winter?" The co-evolution of Earth's biosphere and climate.

471 Geography and Appraisal of Soils of the World Fall. 3 credits. Prerequisite: Agronomy 260 or equivalent. S-U grades optional. Lecs. T R 10-10; disc, W 2-30-4.5. A. Van Wambeke. The character of principal kinds of soils in the major regions of the tropics. Soil properties are related to the
position in the landscape and to profile genesis. Emphasis is on soil properties as a basis for interpretation of crop management requirements and production needs. Principles introduce principles whose applications are examined through discussions, problem solving, and independent reading.

W 1:25–4:25; some field trips will not return before 5:30. J. M. Duxbury.
A combination of discussion and field and laboratory study of the genesis, physical and chemical properties, agricultural uses, and management of organic soils.]

[474 Forest Soils Fall. 3 credits. Prerequisite: Agronomy 260 or permission of instructor. Lects, T R 11:15; lab, T 1:25–4:25. S. J. Rha.
Ecology of forest soils. Application of basic physical and chemical principles to the study of energy, water, and nutrient budgets of forest ecosystems. Implications for forest management.]

[476 Soil Microbiology, Lectures Spring. 3 credits. Prerequisite: Agronomy 260 or Microbiology 290. Offered alternate years. Not offered 1986–87.
A study of the major groups of soil microorganisms, their ecological interactions, and the biochemical functions of organisms in soils.]

[480 Management Systems for Tropical Soils Fall. 3 credits. Prerequisite: Agronomy 471 or permission of instructor. S-U grades optional. Offered alternate years. Not offered 1986–87.
Lecs, T R 8; disc, T 2:30–4:25. A. Van Wambeke.
Land evaluation in tropical areas and water requirements in semiarid tropics. Management of tropical soils in relation with nitrogen, acidity, liming, phosphorus, and other nutrients. Effects of cropping systems on soils, soil conservation methods, and erosion control.]

[482 Transfer Processes in Soil Spring. 4 credits. Prerequisites: Agronomy 260 or equivalent.
Lecs, M W F 11-10–12; disc. to be arranged. R. J. Wagenet.
An introduction to basic principles of water movement in saturated and unsaturated soil, evapotranspiration, gas exchange, and solute transport. Applications are considered through discussions and problem sets.]

[497 Special Topics Fall or spring. 1–6 credits. S-U grades optional. Undergraduates must attach to their course enrollment material written permission from the staff member who will supervise the work and assign the grade.
Hours to be arranged. Staff.
The topics are arranged at the beginning of the term for individual study or for group discussions.

[498 Teaching Experience Fall or spring. 1–5 credits. S-U grades optional.
Hours to be arranged. Staff.
Teaching experience in crop science, meteorology, or soil science is obtained by assisting in the instruction of a departmental course.

[499 Undergraduate Research Fall or spring.
Credit arranged. Written permission from the staff member who will supervise the work and assign the grade must be attached to course enrollment material. Hours to be arranged. Staff.
Independent research on current problems selected from any phase of crop science, meteorology, or soil science.]

T R 11:15. G. W. Olson.
Principles, practices, and research techniques in interpreting soil information and maps for planning, developing, and using areas of land.]

[608 Water Status in Plants and Soils Fall. 1 credit. Prerequisite: permission of instructor. S-U grades optional. Offered alternate years.
Lec, 1 hour to be arranged; lab, R 1:25–4:25 or as arranged. R. D. Miller; T. L. Setter.
Techniques for field appraisal of the status of water in plants and soil, including methods used in evapotranspiration studies.]

[610 Physiology of Environmental Stresses Spring. 3 credits. Prerequisite: Biological Sciences 242 or 341. Offered alternate years. Not offered 1986–87.
A study of the responses of plants to environmental stresses, including chilling, freezing, high temperature, and drought. Emphasis is on the physiological and biochemical basis of injury and plant resistance mechanisms at the whole-plant, cellular, and molecular levels.]

[611 Crop Simulation Modeling Fall. 3 credits. Prerequisite: Biological Sciences 242 or 341. Recommended: computer programming experience. Offered alternate years. Not offered 1986–87.
M W F 11:15. G. W. Pick.
A study of existing crop models is followed by development and refinement of programs representing the students’ work. Emphasis is on quantitative formulation and testing of complex hypotheses related to crop growth, development, yield, weather, transpiration, microclimate, soil water supply, root functions, and dry matter distribution in growing crops.]

[612 Seed Physiology Spring. 3 credits. Prerequisite: plant physiology.
Morphology, physiology, and biochemistry of cereal, legume, and oil seed formation, composition, storage, and germination. Emphasis is on the deposition of seed reserves during seed formation, stabilization of reserves during storage, and mobilization of reserves during germination.]

[613 Ecology and Physiology of Yields Fall. 3 credits. Prerequisite: plant physiology.
A study of the effects of the environment on crop productivity from a physiological perspective. Influence of environment and genetics on the assimilation, translocation, and partitioning of carbon and nitrogen during crop ontogeny. Emphasis on growth processes of vegetative plant organs.]

[614 Advanced Weed Science Spring. 3 credits. Prerequisite: Agronomy 315 or equivalent.
Lecs, T R 8; lab to be arranged. B. W. Duke.
In-depth examination of herbicide behavior in soils and plants. Emphasis is given to a thorough understanding of herbicide penetration, translocation, molecular fate, and site of action. All herbicide families are covered with emphasis on those in current use.

[660 Remote Sensing Fundamentals Fall. 3 credits. Prerequisite: permission of instructor. Offered 1986–87.
Fundamentals of sensing earth resources with sensors of electromagnetic radiation. Coverage includes sensors, sensor and ground-data acquisition; data analysis and interpretation, and project design.]

[661 Remote Sensing Applications Spring. 3 credits. Prerequisite: permission of instructor. Offered 1986–87.
Applications of remote sensing in various environmental disciplines. Emphasis is on the use of aircraft and satellite imagery for studying surface features in engineering, planning, agriculture, and natural resource assessments.]

Presentation and discussion of current research developments and applications in remote sensing. Lectures by Cornell staff and invited specialists from government and industry.]

[663 Pedology Spring. 3 credits. Prerequisite: Agronomy 361 or permission of instructor. Offered alternate years. Not offered 1986–87. Textbook recommended, not required.
T R 10–12. R. B. Bryant.

[666 Advanced Soil Microbiology Fall. 1 credit. Prerequisite: Agronomy 476 or permission of instructor. S-U grades only for graduate students.
Discussions of current topics in special areas of soil microbiology. Particular attention is given to biochemical problems in microbial ecology.

[667 Soil Physics Fall. 3 credits. Prerequisites: Agronomy 260 and a year of college physics or permission of instructor. S-U grades optional. Offered alternate years.
M W F 11:15. R. D. Miller.
A study of physical properties and processes in soils, with emphasis on basic principles.

[669 Soil Organic Matter Fall. 2 credits. Prerequisites: Agronomy 260 and Chemistry 357–358 or equivalent.
T R 9:05, disc to be arranged. J. M. Duxbury.
A discussion of current concepts of the nature, mode of formation, dynamics, and role of organic matter in soils. Some consideration is given to the behavior of manufactured organic chemicals in the soil environment.

[670 Applications of Soil Physics Spring. 3 credits. Prerequisites: Agronomy 482 or equivalent, and calculus.
Offered alternate years. 3 lecs per week. Hours to be arranged. R. J. Wagenet.
Discussion of soil water and solute movement under field conditions. Development of models that include transport, interaction, and transformation of solutes. Consideration of spatial variability of soil properties and how to treat it quantitatively.

[690 Root-Soil Interactions Fall or spring. 1–2 credits. S-U grades optional.
Hours to be arranged. R. W. Zobel.
A topic dealing with root-soil interaction will be selected during the first meeting of the term. Students will prepare one or two seminars based on published work on the topic. Possible topics include root genetics, root morphology, conservation tillage, and soil temperature.

[691 Special Topics in Crop Science Fall or spring. 1–6 credits. S-U grades optional.
Hours to be arranged. Staff.
Study of topics in crop science that are more specialized or different from other courses. Special topics to be offered will depend on staff and student interest.

[692 Special Topics in Meteorology Fall or spring. 1–6 credits. S-U grades optional.
Hours to be arranged. Staff.
Study of topics in meteorology that are more specialized or different from other courses. Special topics to be covered will depend on staff and student interest.

[693 Special Topics in Soil Science Fall or spring. 1–6 credits. S-U grades optional.
Hours to be arranged. Staff.

Animal Sciences


An introduction to the biology of domestic animals in the context of commercial animal production. Required readings and assignments expose the student to an introductory treatment of the anatomy and physiology of domestic animals. The lectures focus on processes (growth, development, nutrition, locomotion, reproduction, egg production, lactation, etc.) that illustrate the application of the biological material to the science of animal production and use.

102 Introductory Animal Management Fall. 2 credits. For beginning students. S-U grades optional. Normally taken concurrently with Animal Sciences 102.


An introduction to the biology of domestic animals in the context of commercial animal production. Required readings and assignments expose the student to an introductory treatment of the anatomy and physiology of domestic animals. The lectures focus on processes (growth, development, nutrition, locomotion, reproduction, egg production, lactation, etc.) that illustrate the application of the biological material to the science of animal production and use.

105 Contemporary Perspectives of Animal Science Spring. 1 credit. Limited to freshmen, sophomores, and first-year transfers.


A forum to discuss the contemporary and future role of animals in relation to human needs and career planning.

112 Livestock Nutrition Spring. 4 credits. Prerequisite: Chemistry 103 or 207 Recommended: Animal Sciences 101 and 102.


An introduction to animal nutrition covering fundamentals of nutrition, the nutritive value of feeds, and the application of feeding standards to various forms of production in dairy and beef cattle, sheep, swine, horses, and poultry, including as much hands-on experience as possible. The feeding, breeding, lactation, growth, and carcass merit of these animals are also considered.

120 Seminar on Genetics of the Horse Spring. 1 credit. Limited to freshmen, sophomores, and first-year transfers.

T or W 10:10; lab, R 11:15; lab, W 2-4:25. Field trips during lab periods may last longer. R. E. Austic.

An introduction to the biology of domestic animals in the context of commercial animal production. Required readings and assignments expose the student to an introductory treatment of the anatomy and physiology of domestic animals. The lectures focus on processes (growth, development, nutrition, locomotion, reproduction, egg production, lactation, etc.) that illustrate the application of the biological material to the science of animal production and use.

121 Nutrition of Companion Animals Fall. 1 credit. Prerequisite: Animal Sciences 112 or equivalent.

W 7:30-9:25 p.m. H. F. Hirtz.

Nutrition of companion animals, with emphasis on the dog and cat. Digestive physiology, nutrient requirements, feeding practices, and interactions of nutrition and disease.

220 Animal Reproduction and Development Spring. 4 credits. Each lab limited to 36 students. Prerequisite: Animal Sciences 102 or equivalent.


Animal Sciences 49

An introduction to the comparative anatomy and physiology of reproduction of farm animals. The life cycle from fertilization through development and growth to sexual maturity is studied, with emphasis on physiological mechanisms involved, relevant genetic control, and application to fertility regulation of animal and human populations. An audiotutorial laboratory is available for independent study to prepare for laboratory experiments.

221 Introductory Animal Genetics Fall. 3 credits. Prerequisite: a year of college biology.


An examination of basic genetic principles and their application to the improvement of domestic animals, with emphasis on the effects of selection and mating systems on animal populations.


Designed to acquaint the student with the scope of the poultry industry. Emphasis is on the principles of avian biology and their application in the various facets of poultry production.

250 Dairy Cattle Fall. 3 credits. S-U grades optional.


Emphasis on economical and type traits to be used in the selection and evaluation of dairy cattle. Practical sessions include planned trips to dairy herds in the state.

265 Horses Spring. 3 credits. Prerequisite: Animal Sciences 250 or equivalent.

Lab, W 12:20-4:25. 1 all-day field trip.

J. M. Regenstein, G. L. Rumsey, J. E. Low.

Selection, management, feeding, breeding, and training of light horses.

290 Meat Science Fall. 3 credits.

Lecs. T R 10:10; lab, M T or W 1:25-4:25.

J. R. Stouffer.

An introduction to meat science through a study of the characteristics of meat from slaughter to consumption. Structure, composition, inspection, grading, preservation, cutting, and processing are included. An all-day field trip to commercial meat plants is taken.

321 Seminar in Genetics of the Horse Spring. 1 credit. Prerequisite: Animal Sciences 265 or permission of instructor. Recommended: Animal Sciences 221 or Biological Sciences 281.

T or W 9:05. L. D. VanVleck.

A discussion of genetics of the horse, with special reference to simply inherited traits and selection for quantitative traits.

330 Commercial Poultry Production Fall. 2 credits. Prerequisite: Animal Sciences 101, 102, 230, or permission of instructor. Offered in odd-numbered years.


The course emphasizes production and business management aspects of commercial poultry farm operation and is designed to acquaint the student with current technology involved in commercial poultry production.
The nature of the infectious and parasitic diseases of poultry and the principles of hygiene applicable to poultry farming for the prevention and control of diseases.


The concepts of decision making under uncertainty are presented. The course covers model building for a decision problem, assessment and revision of probabilities, value of information, options for making a choice, and preference theory and methods for dealing with risk, such as risk sharing and diversification. The concepts are presented in an animal production context.


Emphasis is on the management of reproduction, nutrition, and selection in beef cattle enterprises. A cattle growth model is studied. Laboratories acquaint students with the management skills of a beef operation. Students are required to spend several days during the semester feeding, observing calving, and caring for cattle.

370 Swine Production Fall. 3 credits. Limited to 80 students; each lab limited to 40 students. Prerequisite: Animal Science 112, 220, 221 or permission of instructor. Lecs., T R 11:15; lab or reports of undergraduate research and honors projects. Students present oral and written reports.


The breeding, feeding, management, and selection of sheep. Lectures and laboratories are designed to give the student a practical knowledge of sheep production as well as the scientific background for improved practices.


Fundamental biological principles of meat animal growth and factors influencing composition are presented. Principles and techniques of meat animal and carcass grading and evaluation are discussed and followed by student evaluation of live animals and the carcasses from them.

392 Animal Growth Biology Fall. 2 credits. Not open to freshmen; sophomores by permission of instructor only. Prerequisites: one year of college biology and one course in animal or human physiology. Animal Science 112, and Animal Science 221. Lec R 1:25-4:25. D. H. Beermann.

A detailed discussion of the anatomy and physiology of growth in domestic farm animals. Cellular aspects of tissue-growth patterns, their relationship to body composition, and measurement of growth and body composition will be discussed. Endocrine, genetic, nutritional, and pharmacological influences on growth metabolism and body composition will be emphasized.

400 Livestock Production in Warm Climates Spring. 3 credits. Prerequisite: Animal Sciences 112, 220, or 221 or permission of instructor. Lec., T R 9-12; disc W 1:25-3:20. Staff.

An analysis of constraints of tropical environments to livestock production, roles of animals on low-resource farms, the interdependence of crop and animal systems in livestock development. The need for sequential planning and a systems approach to livestock development are stressed. Application of principles introduced during lectures and examined through case studies and independent study.

401 Dairy Production Seminar Spring. 1 credit. Limited to juniors and seniors. Disc., M 7:30 p.m. D. E. Bauman.

Students, with the help of faculty members, complete a study of the research literature on topics of current interest in the dairy industry. Students make oral and written reports.

402 Seminar in Animal Sciences Spring. 1 credit. Limited to juniors and seniors. May be repeated. S-U grades optional. Lectures to be arranged. L. D. VanVleck and staff.

Review of literature pertinent to topics of animal science or reports of undergraduate research and honors projects. Students present oral and written reports.

403 Forages of the Tropics for Livestock Production Spring. 3 credits. Limited to seniors and graduate students except by permission of instructor. Prerequisites: crop and livestock nutrition. Offered even-numbered years.

Lec., T R 12:20; disc, T 1:25; V. E. Gracen, P. J. VanSoest.

An overview of tropical grasslands, seeded pastures, and crop residues as feed resources; grass and legume characteristics; establishment and management of pastures; determination of feeding-value forages and crop residues; physiology of digestion of ruminants that affects feeding behavior of various species; problems of chemical inhibitors in plants; and utilization of tropical forages as hay or silage.

410 Principles of Animal Nutrition Fall. 3 credits. Prerequisite: organic chemistry. Recommended: biochemistry or concurrent registration in a biochemistry course.

M W F 11:15; 2 discs to be arranged. 2 evening prelins to be arranged. C. C. McCormick.

A fundamental approach to nutrition focusing on the metabolism as well as the biochemical and physiological function of the known nutrients. The basic principles of nutrition are elaborated with examples drawn from a broad range of animal species, including humans. Emphasis is also directed toward nutritional techniques and the application of the topics covered.

415 Poultry Nutrition Spring. 1 credit. Prerequisite: Animal Sciences 410 or permission of instructor. F 11:15; G. F. Combs, Jr.

A practical consideration of principles of nutrition applied to feeding poultry, including use of linear programming techniques in diet formulation.

418 Mutagenesis and Genetic Toxicology (also Toxicology 418) Spring. 2 credits. Prerequisites: introductory courses in genetics or biochemistry or permission of instructor. Offered odd-numbered years.

Lec., W 7-9 p.m. S. E. Bloom.

A study of the alterations in the genetic material of animals and man by natural and man-made chemicals. Topics include attack on DNA by mutagens, repair of DNA lesions, gene and chromosome mutation, spindle poisons, mutations and cancer, genetic toxicology testing, and risk assessment.

419 Animal Cytogenetics (also Toxicology 419) Fall. 4 credits. Prerequisites: Animal Sciences 221, Biological Sciences 281, or permission of instructor. Not offered 1986-87.


A study of normal and abnormal chromosomes in higher animals. Lectures cover the organization, chromosome movement, cytogenetics of abortuses, parthenogenesis, chromosomes and cancer, mitotic and meiotic errors, human clinical cytogenetics, and biotechnology.

420 Quantitative Animal Genetics Fall. 3 credits. Lecs., T R 11:15; lab, W R F or 2-4:25. L. D. VanVleck.

A consideration of problems involved in improvement of animals, especially farm animals, through application of the theory of quantitative genetics, with emphasis on selection index.

421 Seminar in Animal Genetics Fall. 1 credit. Prerequisite: Animal Sciences 221 or concurrent registration in Animal Sciences 420.

Lectures to be arranged. L. D. VanVleck.

R. W. Everett.

A discussion of applications of principles of quantitative genetics and animal breeding to specific types of animals such as dairy animals, meat animals, and horses.

422 Research Techniques in Quantitative Animal Genetics Fall. 1 credit. Prerequisite: Animal Sciences 420 or concurrent registration in Animal Sciences 420.


A introduction to methods of research in quantitative genetics and animal breeding, including estimation of heritability, repeatability, and genetic and phenotypic correlations.

427 Fundamentals of Endocrinology Fall. 3 credits. Prerequisite: human or veterinary physiology or permission of instructor.


The physiology of the endocrine glands and the roles played by each hormone in the regulation of normal body processes. Endocrine regulation of growth, metabolism, and reproduction is emphasized. Examples are selected from domestic species and humans.

428 Fundamentals of Endocrinology, Laboratory Fall. 2 credits. Each lab limited to 30 students.

Concurrent registration in Animal Sciences 427 or permission of instructor. Lab., T or R 1:25—4:25. R. W. Butler.

Laboratory exercises are designed to demonstrate hormonal mechanisms for each of the major endocrine glands. Laboratory techniques include animal surgery, blood collection, and hormone radioimmunoassay. Several species of domestic and laboratory animals are utilized.

430 Artificial Breeding of Farm Animals Fall. starting August 15. 2 credits. Prerequisites: Animal Sciences 220 or equivalent. Prerequisite of instructor must be obtained at course enrollment.


Principles of artificial breeding and practical animal and laboratory experience in semen collection, semen evaluation, semen freezing, and artificial insemination of farm animals.

431 Embryo Handling and Transfer Fall. 1 credit. Prerequisites: Animal Sciences 220 and 430 or their equivalent. Begins immediately after Animal Sciences 430 and goes for two weeks, including fall break.
Permission of instructor must be obtained at course enrollment. S-U grades only.
Lecs, T R 9:05; labs, B–D during fall break and one 4-hour lab by arrangement. R. H. Foote.

Designed to provide students with the requirements for managing animals and embryos in a successful embryo transfer program (5 lectures and films). The practical work consists of superovulation, embryo recovery, evaluation, manipulation, freezing, and transfer.

450 Immunophylogeny
Spring. 3 credits.
Prerequisite: basic immunology and animal physiology or permission of instructor.
Lecs, M W F 11:15; 2 evening prelims to be arranged. J. A. Marsh.

Emphasis on the development and regulation of the immune system and the physiological parameters affecting or affected by immune function. Major topics include development immunology, immunoregulation, immunological involvement in reproduction and gonadal function, interrelationships between immune and endocrine functioning, and the immunology of aging.

451 Lactation Biology
Spring. 3 credits.
Prerequisite: either Animal Sciences 220 and Biological Sciences 221 or permission of instructor. Not offered 1986–87.
Lecs, T R 9:05; lab, R 2–4:25; R. C. Gorenwitz.

Emphasis is on mammary gland development, anatomy, physiological control of milk secretion, and biochemical synthesis of milk constituents in farm and laboratory animals.

452 Comparative Physiology of Reproduction of Vertebrates (also Biological Sciences 452)
Spring. 3 credits.
Prerequisite: Animal Sciences 427 or permission of instructor.
Lecs, M W F 1:25. One prelab at 7:30 p.m. A. van Tienhoven.

Sex and its manifestations. Neuroendocrinology of reproduction, sexual behavior; gametogenesis, fertilization, embryonic development, care of the zygote environment and reproduction, and immunological aspects of reproduction.

455 Dairy Herd Management
Spring. 4 credits.
Prerequisites: Animal Sciences 122, 220, 221, and 250, or equivalents. Recommended: Agricultural Economics 302.
Lecs, M W F 11:15; lab, M T 1:25–4:25, plus 1 unscheduled half-day lab period. W. G. Merrill and staff.

Application of scientific principles to practical herd management, analyses of alternatives, and decision making. Laboratories emphasize practical applications, problem solving, and discussion.

456 Dairy Management Fellowship
Fall or spring. 2 credits. Limited to seniors. Prerequisites: Animal Sciences 455, Agricultural Economics 302 or equivalent, and permission of instructor. S-U grades only.

Hours to be arranged. D. M. Galton.

The program is designed for undergraduates who have a sincere interest in dairy farm management. Objectives are to gain further understanding of the integration and application of dairy farm management principles and programs with respect to dairymen’s objectives and methodology, to expand the concept of team approach in the development and implementation of management programs, and to gain further understanding of the role of research and industry in agriculture. Students are selected during the spring semester of the junior year according to their commitment to dairy farm management in course program and career goals.

466 Immunogenetics (also Biological Sciences 466)
Spring. 4 credits. Limited to 25 students.
Prerequisites: a course in immunology and Animal Sciences 221 or Biological Sciences 281, or permission of instructor. Not offered 1986–87.

The genetic control of a variety of cellular antigens and their use in understanding biological and immunological functions. The genetics of antibody diversity, antigen recognition, immune response, transplantation, and disease resistance.

490 Commercial Meat Processing
Spring. 3 credits.
Prerequisite: Animal Sciences 290 or permission of instructor. Offered even-numbered years.
Lecs, T R 9:05; lab, T R 1:25–4:25. Field trip to commercial meat processing plants.
D. H. Beermann.

A study of the classification, formulation, and production of commercially available processed meat products. Physical and chemical characteristics of meat and nonmeat ingredients; their functional properties; various methodologies; microbiology; packaging, handling, and storage, and quality assurance are discussed.

497 Special Topics in Animal Sciences
Fall or spring. 1–3 credits; may be repeated for credit.
Prerequisite: permission of instructor. S-U grades optional.
Staff.

May include individual tutorial study or a lecture topic selected by a professor. Since topics may change, the course may be repeated for credit.

498 Undergraduate Teaching
Fall or spring. 1 or 2 credits. 4 credits maximum during undergraduate career. Limited to students with grade-point averages of at least 2.7.
Designed to consolidate the student’s knowledge. A participating student assists in teaching a course allied with the student’s education and experience. The student is expected to meet regularly with a discussion or laboratory section, to gain teaching experience, and regularly to discuss teaching objectives, techniques, and subject matter with the professor in charge.

499 Undergraduate Research
Fall or spring. 6 credits maximum during undergraduate career. Not open to students who have earned 6 or more undergraduate research credits elsewhere in the college. Limited to juniors and seniors with grade-point averages of at least 2.0.
Affords opportunities for students to carry out independent research under appropriate supervision. Each student is expected to review pertinent literature, prepare a project outline, conduct the research, and prepare a report.

600 Research
Fall or spring. Credit to be arranged. S-U grades optional.

Hours to be arranged. All members of animal sciences program area.

601 Proteins and Amino Acids in Nutrition (also Nutritional Sciences 601)
Spring. 2 credits.
Prerequisites: physiology, biochemistry, and nutrition, or permission of instructors. Letter grades only. Offered even-numbered years. Not offered 1986–87.
W F 10:10; R. E. Austic, M. Morrison.

A course in amino acid and protein nutrition, with emphasis on the dynamic aspects of protein digestion and amino acid absorption, protein and amino acid metabolism, nutritional interrelationships, assessment of protein quality, amino acid availability and amino acid requirements in humans, monogastrics, and ruminants.

604 Vitamins
Fall. 2 credits.
T R 10:10; G. F. Combs, Jr.

A discussion of the chemistry, biochemistry, and physiological functions of the vitamins, with emphasis on nutritional aspects.

605 Forage, Fiber, and the Rumen
Spring. 4 credits.
Prerequisites: either general nutrition and biochemistry or permission of instructor. S-U grades optional.

Ruminant nutrition; lower-tract fermentation in monogastrics; nutritional biochemistry of forage plants, fiber, and cellulosic material.

607 Microbiology of the Rumen
Fall. 3 credits.
Prerequisites: general biochemistry and microbiology. Offered even-numbered years.
Lecs, M W F 10:10; J. B. Russell.

Nutrition, biochemistry, physiology, taxonomy, and ecology of rumen microorganisms. Effects of rumen microbial ecology on ruminant nutrition. Manipulation of rumen fermentations to maximize host-animal performance.

609 Seminar in Poultry Biology
Fall and spring. Limited to graduate students. S-U grades only.
Hours to be arranged. Staff.
A survey of recent literature and research in poultry biology.

610 Seminar
Fall and spring. 1 credit. Required of all graduate students with a major or minor in animal sciences. S-U grades only.
M 11:15. Department faculty.

613 Forage Analysis
Spring. 2 credits.
Prerequisite: permission of instructor. S-U grades optional.
Lab, R 2–4; P. J. Van Soest.

Chemical composition and nutritive evaluation of forage plants and related materials. The course includes a term paper summarizing results of independent laboratory study of either materials or methods.

619 Field of Nutrition Seminar
Fall and spring. No credit. S-U grades only.
M 4:30. Current research in nutrition is presented by visitors and faculty.

620 Seminar in Animal Breeding
Fall and spring. 1 credit. Limited to graduate students with a major or minor in animal breeding. S-U grades only. Hours to be arranged.

621 Seminar in Reproductive Physiology
Fall and spring. 1 credit. Registration limited to graduate students. Advanced undergraduates welcome to attend. S-U grades only.
W 4:30; W. R. Butler and staff.

Current research in reproductive physiology is presented by staff members, graduate students, and visitors.

640 Special Topics in Animal Sciences
Fall or spring. 1 or more credits. S-U grades optional. Hours to be arranged. Staff.
Study of topics in animal science more advanced than, or different from, other courses. Subject matter depends on interests of students and availability of staff.

720 Experimental Methods in Quantitative Genetics and Animal Breeding
Spring. 3 credits.
Prerequisites: matrix algebra, linear models, and mathematical statistics. S-U grades optional.
Hours to be arranged. R. L. Quaas.

Estimation of genetic and environmental parameters required to design efficient selection programs. Emphasis is given to interpretation of experimental and survey data with unequal subclass numbers, and prediction of genetic progress resulting from alternative selection methods.

Related Courses in Other Departments

Introductory Animal Physiology (Biological Sciences 311)

Introductory Animal Physiology Laboratory (Biological Sciences 319)

Milk Quality (Food Science 351)
Scientists

Special Studies of Problems of Livestock Production in the Tropics (International Agriculture 602)

Lipids (Nutritional Sciences 602)

Basic Immunology, Lectures (Veterinary Medicine 315)

Basic Immunology, Laboratory (Veterinary Medicine 316)

The Population Biology of Health and Disease (Veterinary Medicine 330)

Health and Diseases of Animals (Veterinary Medicine 475)

Biological Sciences

The program of study in biology is offered by the Division of Biological Sciences. For course descriptions, see the section on the Division of Biological Sciences.

Communication

R. D. Colle, chairman; N. E. Awa, M. deTurck,
B. O. Earle, C. J. Glynn, D. A. Grossman, J. E. Hardy,
D. G. McDonald, R. D. Martin, R. E. Ostman,
T. M. Russo, C. Scherer, D. F. Schwartz (on leave 1986–87), M. A. Shapiro, R. E. Shew, P. Stepp,
R. B. Thompson, W. B. Ward, S. A. White, C. Whittle,
A. M. Wilkinson, J. P. Yarbrough

The middle and last digits of course numbers are used to denote specific areas:

00-09 Speech communication
10-19 Interpersonal communication
20-29 Mass communication
30-39 Visual communication and graphic design
40-49 Electronic media
50-59 Journalistic writing
60-66 Professional writing
67-69 Editing
70-79 Communication planning and strategy
90-94 Special topics and seminars
95-99 Individualized study

116 Theories of Human Communication

Spring or summer. 3 credits. Not open to first-semester freshmen. S-U grades optional.

Spring: Lees, M W F 9:05. Staff.

An introduction to human communication from a multidisciplinary perspective. Contributions from psychology, philosophy, neurology, social psychology, linguistics, anthropology, and communication theory are considered.

120 Introduction to Mass Media

Fall or summer. 3 credits. S-U grades optional.

Fall: Lees, M W F 9:05. D. McDonald.

History, processes, philosophies, policies, and functions of United States communication media. Each major medium is examined individually in regard to information processing and persuasion. Effects of messages, regulation of media, and other contemporary issues are examined.

150 Writing for Media

Fall, spring, or summer. 3 credits. Limited to communication arts majors—freshmen and transfers—fall and spring; open in summer.

Lec, T R 9:05–11:10; lab, R 9:05–11:10; R 11:15–1:10; Staff.

Basic writing for print and broadcast. A back-to-basics approach to writing for clarity and style, using news and feature writing as a framework. Media form and style are analyzed. Weekly writing assignments, both in and outside of class, are given. Typing skill required.

161 Writing in the Biological Sciences


Factual, informative writing based on information and laboratory experiences in biology. Emphasis on writing rather than subject matter and on objective observation rather than subjective personal experience. Discussion of effective sentence and paragraph structure, organization, usage, grammatical structure, meaning of words, and punctuation. Objective is clear, concise, concrete writing.

201 Oral Communication

Fall, spring, or summer. 3 credits. Each section limited to 24 students. Preference given to sophomores, juniors, and seniors. Students missing the first two class meetings without University excuse are dropped so others may register. No student will be added or dropped after the second week of classes. Letter grades only.


Through theory and practice the student develops self-confidence and competence in researching, organizing, and presenting material to audiences. Students give four graded speeches; write short papers, perform speaker evaluations, and engage in other speech-related activities.

203 Argumentation and Debate

Fall. 3 credits. Prerequisite: Communication 201.

T R 12:20–1:45; P. Stepp.

The student will learn the principles of argumentation and the rules of debate. Classroom debates on the CEDA national topic will provide experience in critical thinking, rapid organization of thoughts, employment of research, and writing and speaking in a logical, persuasive manner

204 Effective Listening

Spring or summer. 3 credits. Limited to 25 nonfreshman students per section. No students accepted or allowed to drop after the second week of classes. Letter grades only.

Lec, M 1:25–2:40; lab, T or W 1:25–2:40 or W 3:00–4:15; Staff.

Lecture, sections, and demonstrations are used to present an analysis of the process of listening; to identify barriers to effective listening, and to teach techniques for improving listening, memory, attention span, note taking, and other information-handling techniques. Topics from audiography, rhetoric, linguistics, intercultural communication, and the fine arts are also addressed. Students do frequent skill-building exercises in comprehension and retention.

205 Parliamentary Procedure

Fall or spring. 3 credits. Each section is limited to 50 nonfreshman students. No adds or drops allowed after the second week of classes. Letter grades only.

Lec, M 12:20; lab, T R 12:20–1:25; R. D. Martin.

A detailed study of the principles and rules of parliamentary procedure using Robert's Rules of Order, newly revised, as the text. Emphasis on practical experience; the performance of a well-run meeting as an integral component of effective communication. Includes outside meeting evaluations; preparation of bylaws; and practice in serving as a presiding officer, secretary, and committee member in a simulated meeting situation.

230 Visual Communication

Fall. 3 credits. Limited to nonfreshman and communication arts freshmen. Not recommended for design or art majors. Cost of project materials, $20–$30.

Lec, T R 9:05; computer lab to be announced. C. Scherer.

A basic course in the use and importance of visual communication. Focuses on objectives, audiences, and methods of visual production. Particular emphasis is placed on the visual communication of scientific and technical information. The laboratory concentrates on the use of computers for production of visual materials. Practical projects are assigned.

232 Art of Publication

Spring. 3 credits. Each lab limited to 30 nonfreshman students. Project materials cost $30–$50.

Lec, M W 1:25; lab, M or W 2:30–4:25; Staff.

A basic course designed to explore visual concepts that increase communication effectiveness through the written word. The importance of selecting and coordinating format, layout, typography, and illustrations is stressed. Lectures, a field trip, in-class laboratory assignments, and outside projects examine opportunities and problems in publication design and production.

234 Photo Communication

Fall or spring. 2 credits; summer, 2 credits plus 1 credit lab. Lab only limited to 25 students. A lecture course for those with limited experience in photography. Students are expected to supply their own cameras. Summer lab fee, $75.

T R 9:05–1:25; Staff.

Basic photography; photojournalism is emphasized during the latter part of the course. Summer session laboratory also includes film processing, projection printing, and photographic lighting.

250 Basic Newswriting for Newspapers

Fall or spring. 3 credits. Limited to 30 students. Prerequisite: major in communication or permission of instructor. Typing ability is essential.

Lec, R 1:25–2:20; lab, R 2:30–4:25, plus out-of-class writing assignments. R. E. Shew

Writing and analyzing news stories. A study of the elements that make news, sources of news, interviewing, writing style and structure, press problems, and press-society relations. Concentration on newswriting as it is practiced by newspapers in the United States. Two writing assignments each week, one done in class, one done out of class.

272 Principles of Public Relations and Advertising

Fall. 3 credits.

Lec, M W F 1:25; C. Whittle.

Survey of the fields of public relations and advertising. Descriptions of organizations, jobs, and functions in the industry. The roles of public relations and advertising in society, the economic system, and organizations. Psychological and sociological principles as formulations for strategies. Techniques of media selection and message execution. Introduction to research and regulation.

301 Business and Professional Speaking

Fall or spring. 3 credits. Prerequisite: major in communication or permission of instructor.

Lec, M 11:15; lab, T R 10:10–12:05 or W 11:15–1:10; B. O. Earle.

The study and practice of oral communication skills used in organizations, including speeches, interviews, reports, and discussions. It is expected that students will develop the analytical and presentation skills needed in business and professional careers.

314 Small-Group Communication

Spring. 3 credits. Limited to juniors and seniors. Prerequisite: Communication Arts 116 or permission of instructor.

T R 1:25–3; N. E. Awa.

Exploration of the principles, values, and limitations of group discussion in democratic systems. Principles are put into practice in decision-making and problem-solving groups.
342 Radio and Television Communication
Summer. 3 credits. Staff.
An overview of the roles of radio and television in contemporary society, with particular emphasis on the development, organization, and influence of these media in the United States. Attention is also given to the structure and uses of radio and television in other nations, to provide perspective on the systems here, and to the techniques and constraints involved in program production.

344 Writing and Production
Fall. 3 credits. Prerequisite: Communication Arts 120 or permission of instructor.
Lecs. TR 1:25; lab. T 2:30-4:25. Staff.
Offered in fall. Involves practical experience in writing, editing, and layout principles practiced in majors. Prerequisite: Communication Arts 232, 250, or 350.

346 Television Writing and Production
Spring. 3 credits. Limited to 25 students. Prerequisite: Communication Arts 120 or permission of instructor.
Creation of television information programs, from development of idea through research, scripting, and production.

360 Scientific Writing for Public Information
Fall, spring, or summer. 3 credits. Limited to 25 freshmen or graduate students per section.
An intensive course in simplifying scientific and technical material for specific audiences within the general public. Weekly assignments include instructions, descriptions, explanations, and summaries in such forms as the newsletter, brochure, and report. Audience analysis will be emphasized. Not oriented to the mass media.

363 Organizational Writing
Fall, spring, or summer. 3 credits. Limited to 25 junior, senior, or graduate students per section.
Students write as members of different organizations, in the position of supervisor, subordinate, colleague, and representative of business, government, community, and other organizations. Emphasis on adapting tone to the audience and the purpose of the message. Weekly writing assignments include various kinds of internal and external reports, memoranda, proposals, and letters. Assignments based on case studies.

365 Writing in the Sciences and Engineering
Fall or spring. 3 credits. Limited to 25 junior, senior, or graduate students per section.
Students write scientific or technical material for colleagues in their own field. The objective is clear, concise writing, with attention to grammatical construction, usage, paragraph development, and organization. Weekly writing assignments include scientific or technical instructions, descriptions of new equipment and procedures, definitions and explanations of concepts, graphic presentations and discussion of data, abstract and summary, memorandum, research proposal, progress report, and research report.

366 Editing
Spring. 3 credits. Limited to 25 junior, senior, or graduate students. Prerequisites: Communication Arts 232, 250, 350, 360, or 365.
Students will follow the process that takes a manuscript from final draft to page proof. Emphasis will be on editing, proofing, copy, working with authors, making editorial decisions, and developing skill in critical reading. Appropriate for any student who expects to work with manuscripts or do editorial work.

372 Advanced Advertising
Spring. 3 credits. Prerequisite: Communication Arts 272 and communication or marketing major.
C. Whittle
A continuation of Communication Arts 272. Examination of the qualitative and quantitative aspects of the mass media and how they are evaluated by consumers. Students formulate and execute a media mix survey of advertising from the viewpoints of the consumer. Introduction to research in advertising, with emphasis on identifying and predicting advertising effectiveness. Investigation into the planning, creation, and evaluation of advertisements and advertising campaigns.

375 Communication Planning and Strategy I
Spring. 3 credits.-Limited to 15 juniors and seniors. Prerequisite: Communication Arts 272 or permission of instructor.
Theories that guide and influence the solutions to public relations and public information problems in agriculture, business education, government, and social welfare organizations. Examination of the process of the formation of public opinion. Discussion of research techniques and communication tools used in communication planning, and fundamentals of developing a communication plan. Case studies and projects.

376 Communication Planning and Strategy II
Fall. 3 credits. Limited to 15 junior and senior communication arts majors. Prerequisite: Communication Arts 375. Communication Arts 382 strongly recommended.
Lec and lab, TR 10:10-11:40. C. Glynn.
A continuation of Communication Arts 375. Focus is on the development and implementation of actual communication campaigns. Students work closely with a community organization in designing and implementing a communication program.

380 Independent Honors Research in Social Science
Fall or spring. 1–6 credits. Limited to undergraduates who have met the requirements for the honors program. N. E. Awa.

382 Survey Research Methods
Fall or spring. 3 credits. Limited to 20 junior, senior, or graduate communication arts majors; others by permission of instructor.
Prerequisite: Communication Arts 116 or 120 or permission of instructor.
Analysis of public opinion polls, market research, media audience ratings, readership surveys, and communication impact designs. Development of class research project from research question to final report. Instruction in computer use of Statistical Package for the Social Sciences (SPSS) to assist in data analysis. Familiarity with basic statistical concepts helpful.

410 Organizational Communication
Fall. 3 credits. Labs limited to 20 junior, senior, or graduate communication arts students; others by permission. Prerequisite: Communication Arts 116 or equivalent. Lees, M W F 11:15, lat. Limited to juniors and seniors. Study of managerial communication practices in formal organizations, with emphasis on communication between supervisor and subordinate, examination of the structure and function of planned and unplanned organizational communication networks. Case studies analyzed in lab.

416 Psychology of Communication
Fall. 3 credits. Prerequisite: Communication Arts 116 or permission of instructor.
An interdisciplinary study of communication theory. Topics include personal interaction, channels of communication, and effectiveness of messages. Study includes intensive analysis of major communication theorists.

418 Persuasion
Spring. 3 credits. Prerequisite: Communication Arts 116.
Lecs. M W F 11-15. Staff. The course concentrates on the analysis and understanding of the persuasion events around us. The assignments stress the application of various theories of persuasion to the interpersonal communication process. Students should have basic understanding of interpersonal communication theory.

421 Broadcast Media Laboratory
Fall. 2 credits. Limited to junior and senior communication arts majors. Prerequisite: Communication Arts 344 or 346. Not offered 1986-87.
Hours as arranged.
An introduction to radio and television production for various audiences. Course work is done primarily through individual tutorial arrangement.

423 Broadcast Media Laboratory
Spring. 2 credits. Not offered 1986-87.
Hours as arranged.
A continuation of Communication Arts 421.

428 Communication Law
Fall. 3 credits. Limited to junior, senior, and graduate students.
M W F 11:15, D. A. Grossman.
agriculture and life sciences

A practical survey of the law governing mass media, primarily for those working in the field. Coverage includes restraints on news gathering and publication, privacy, defamation, copyright, broadcast licensing, access, and other issues of current interest.

498 Internship Fall, spring, or summer. 1–3 credits. Students must apply to department internship committee no later than the spring pre-course enrollment period for a fall internship, or the fall pre-course enrollment period for a spring or summer internship. Prerequisites: communication junior or senior. 3.0 average in communication courses, and approval of committee. S-U grades only.

Lec, one-hour per week to be arranged. C. Whittle. Structured, on-the-job learning experience under supervision of professionals in a cooperating organization. Students have a faculty course supervisor, who must be approved by the department internship committee. The faculty course supervisor awards the credit and grade (S-U only). A learning contract is written between the faculty supervisor and student, stating the conditions of the work assignment, supervision, and reporting. May be repeated to a maximum of 6 credits.

497 Independent Study Fall or spring. 1–3 credits, variable, may be repeated to 6 credits. Limited to seniors and graduate students. Undergraduate students must have 3.0 or better in their last 60 semester hours.Prerequisite: 3.0 cumulative average. Undergraduate students must attach to their course enrollment material written permission from their faculty member who will supervise the work and assign the grade.

Staff Group or individual study under faculty supervision. Work should concentrate on locating, assimilating, synthesizing, and reporting existing knowledge on a selected topic. Attempts to implement this knowledge in a practical application are desirable.

498 Communication Teaching Experience Fall or spring. 1–3 credits, variable, may be repeated to 6 credits. Limited to seniors and graduate students. Undergraduate students must have 3.0 or better in their last 60 semester hours. Prerequisite: 3.0 cumulative average. Undergraduate students must attach to their course enrollment material written permission from their faculty member who will supervise the work and assign the grade.

Staff Hours to be arranged. Periodic meetings with the instructor cover realization of course objectives, evaluation of teaching methods, and student feedback. In addition to aiding with the actual instruction, each student prepares a paper on some aspect of the course.

499 Independent Research Fall or spring. 1–3 credits, variable, may be repeated to 6 credits. Limited to seniors and graduate students. Prerequisite: 3.0 cumulative average. Students must attach to their course enrollment material written permission from the faculty member who will supervise the work and assign the grade.

Staff Permits outstanding students to conduct laboratory or field research in communication under appropriate faculty supervision. The research should be scientific: systematic, controlled, empirical. Research goals should include description, prediction, explanation, or policy orientation and should generate new knowledge.

610 Organizational Communication Spring. 3 credits. Open to seniors.

T R 12:20–1:45. Staff. Study of interpersonal communication systems in organizations. Methods for analyzing organizational and human communication effectiveness, including communication audits and network analysis.

611 Communication in Organizations Fall. 3 credits. Prerequisite: Communication Arts 610 or permission of instructor.

M 1:25–4:25. S. White. Review of theories, research, and practical systems as they relate to human communication effectiveness in organizations. Includes components of interpersonal communication, intragroup and intergroup communication, communication processes involved in organizational goal setting, renewal, and change.

612 Intercultural and Development Communication Fall. 3 credits. Prerequisites: Communication Arts 610 or permission of instructor. A systematic analysis of sociocultural and psycholinguistic obstacles to effective communication between cultures, subcultures, and ethnic and identity groups. Also examined are the subtleties and complexities of nonverbal behavior in cross-cultural transactions. Examples are drawn from ethnocultural and cross-cultural studies.

616 Interpersonal Communication Spring. 3 credits. Limited to graduate students in communication arts; others by permission of instructor.

T 1:25–4:30. N. E. Awa. A study of recent advances in interpersonal communication and social cognition. Theories and research in relational development. Human understanding of social events in an interpersonal context is explored.

620 Public Opinion and Communication Fall. 3 credits. Graduate students and advanced undergraduates.

T 1:25–4:25. C. Glynn. Examination of the concept public opinion: investigation of how it is measured and applied in society. Analysis of relationships between public opinion and communication. Practical applications.

624 Communication in the Developing Nations Spring. 3 credits. Open to seniors.

Lec, M 1:25–4:25. R. D. Colle. An examination of existing communication patterns and systems and their contributions to the development process. Attention is given to the interaction between communication systems and national development in primarily agrarian societies.

626 Impact of Communication Technologies Spring. 3 credits. Open to seniors.

M W 8:30–9:55. P. Yarbrough. A study of emerging technologies of communication, such as computer-based information systems and satellites and their potentials for influencing communication processes and social systems. Also examines the impacts of previous communication innovations from cave painting to television.

665 Scientific Writing for Scientists Spring. 3 credits. Prerequisites: research in progress and permission of instructor.

T R 8:30–9:55. A. M. Wilkinson. Workshop for students with research in progress. Discussion and lectures on writing a journal article, thesis, report, and proposal; on objectives in scientific writing, relation of rhetoric and linguistics to scientific research, and the interrelationships of its various branches.

670 Communication Planning and Strategy Spring. 3 credits. Primarily for graduate students but open to seniors.

T R 10:10–12. C. Scherer. Seminar in the planning of communication activities for the support of directed social-change programs. Examines communication and social theories, case studies, and planning models. Participants produce a comprehensive communication plan designed to solve a significant (real) communication problem of interest to them. Case studies and discussion focus on communication problems from nutrition and health, rural development programs, marketing, nonformal education programs, and government public information campaigns.

680 Studies in Communication Fall. 3 credits. Limited to graduate students in communication arts; others by permission of instructor.

M 1:25–4:25. D. McDonald. A review of classical and contemporary research in communication, including key concepts and areas of investigation. An exploration of the scope of the field and the interrelationships of its various branches.

694 Seminar: Communication Issues Fall and spring. 3 credits. Limited to graduate students.

M W 10:10–12. R. E. Ostman. An analysis of the methods used in communication research. Emphasis is on understanding the rationale for experimental, descriptive (empirical and nonempirical), and historical-critical research methods.

694 Seminar: Communication Issues Fall and spring. 3 credits. Limited to communication arts graduate students. May not be repeated. Students must use the faculty member's section number to register.

Graduate faculty Independent studies and projects are carried out in conjunction with selected undergraduate courses.

798 Communication Teaching Laboratory Fall and spring. 1–3 credits each semester. May be repeated once. Limited to graduate students. Prerequisite: permission of the faculty member who will supervise the work and assign the grade. Students must use the faculty member's section number to register.

Graduate faculty Designed primarily for graduate students who want experience in teaching communication courses. Students work with an instructor in developing course objectives and philosophy, planning, and teaching.

899 Directed Graduate Study Fall or spring. 3–6 credits. S-U grades only. Students must use the faculty member's section number to register.

Graduate faculty

Education


005 Basic Review Mathematics Fall or spring. 3 credits (this credit is not counted toward the 120 credits required for the degree). Primarily for entering students.

Fall: M W F 9:05 or 12:20; spring: M W F 12:20. J. Confrey and staff. Exposes students to some of the concepts necessary for success in other mathematics and science courses. Topics include problem solving, fractions, ratios and proportions, factoring and solving algebraic equations, graphing linear and quadratic equations, and trigonometry. Considerable emphasis is placed on learning to learn mathematics for understanding and on comprehending word problems.

110 Introduction to Psychology Fall. 4 credits.

Lecs. M W F 10:10; 1 disc to be arranged. J. A. Dunn. Survey of the major areas of psychological inquiry, with emphasis on the personal application of psychological knowledge to the problems of living and to current social issues, including how to be an intelligent consumer of psychological research.
115 Introductory College Mathematics Fall or spring. 4 credits.
Lec: M W F 9:05 or 11:15, lab: T R 9:05, 10:10, 11:15, or 12:20 or F 9:05, 10:10, 11:15, or 12:20.
Spring: M W F 9:05 or 11:15, Lab: T R 9:05, 10:10, 11:15, or 12:20. J. Confrey and staff.
Designed to give students with sound high school mathematics backgrounds a unified treatment of the basic concepts of college algebra, analytic geometry, and the elements of precalculus. Emphasis is placed on the concept of function, graphing, problem solving, and applications. The computing language BASIC is taught and used to strengthen and integrate the mathematical topics covered.

Lec, T 2:30-4: labs to be arranged. G. J. Posner
This course is designed for all students interested in finding out more about teaching. Teaching is considered an activity in which people of many occupations engage and not limited to schools. Students engage in field experiences to find out what teaching involves (minimum of two hours a week). Class and laboratory work builds on this experience and provides skills and concepts to make the field experience more profitable.

271 Sociology of Education Spring. 3 credits. S-U grades optional.
TR 10:10–11:30. J. E. Halff
An introduction to the sociological study of schooling and education. Topics include the effects of social factors on educational achievement, the norms and values learned as part of the process of schooling, the relationships between students and teachers, and the school's relations to the economic and political systems. All levels of education, from elementary school to the university, are considered.

311 Educational Psychology Fall or spring. 3 credits. Prerequisite: introductory psychology. S-U grades optional in fall, letter grade only in spring.
Lec, M W 9–11, F to be arranged; R. E. Ripple. Spring: M W F 10:10, J. A. Dunn
An introductory survey course. Emphasis is on human learning and the educational process from a psychological point of view. The course is set in a broadly based teaching-learning context appropriate for prospective teachers, youth group leaders, community leaders, and those in the service-helping professions.

312 Learning to Learn Spring. 3 credits. Prerequisite: one or more courses in psychology or educational psychology.
TR 9:05–10:20. J. D. Novak
This course is intended for persons interested in the improvement of their learning strategies and the application of new ideas and methods to improve educational programs. Lectures and discussions are based on assigned readings and the contributions of class members. The major focus of the course is how and why concepts play a central role in human learning. Concept mapping and other strategies for facilitating learning will be taught. Students will apply principles and methodologies in a project related to their interests.

317 Psychology of Adolescence Spring. 3 credits. Prerequisite: introductory psychology. S-U grades optional.
A survey of the nature of adolescent development, with emphasis on causal factors of adolescent behavior. Focus is on an examination of the interrelationships among the major aspects of adolescent development, an examination of some of the dominant themes of adolescence, and a review of research on adolescent development, and implications for the educational process.

331 Introduction to Agricultural and Extension Education Fall. 3 credits.
Lec, M 2–4:30, lab to be arranged. W. E. Drake and staff.
The course is intended for persons interested in careers as professional educators in agriculture. Careers included are secondary school and two-year college teachers, cooperative extension agents, and educators in agriculture business and industry. The course emphasizes career information, methodology, and introductory teaching experiences. Class activities include presentations by resource persons currently in teaching and extension careers, field trips, and microteaching experiences.

335 Youth Organizations Spring. 3 credits. Prerequisite: introductory psychology or permission of instructor.
Lecs, TR 10:10; lab to be arranged. Staff
The role of selected youth organizations in providing educational experiences for youth. Factors affecting membership, purposes, design, operation, and administration are surveyed; emphasizing the roles the adult volunteer leader may play. The course is designed to give the student an in-depth, learning-by-doing experience of how youth organizations function. Field experience with a recognized youth organization is required.

352 Reading Statistics Fall or spring. 1 credit. Prerequisite for spring: concurrent registration in Education 263.
Fall: T 12:20; spring: T R 8:30–9: J. Millman
An introduction to statistical vocabulary and symbolism frequently used in reporting empirical research in education and other social sciences. Students are taught how to comprehend statistical terminology and results.

353 Introduction to Educational Statistics Spring. 3 credits. Enrollment limited to 40 students.
Prerequisite: Education 352 or concurrent registration, or permission of instructor.
A study of common univariate and multivariate statistical procedures encountered in educational and psychological inquiry. Meaning of concepts and mastery of course content is emphasized; computational details are not stressed. Computers are used extensively in class to develop understanding of the properties of statistical indices.

370 Issues in Educational Policy Spring. 3 credits.
An examination of selected policy issues in current education. Included are such topics as equality of educational opportunity, student, parent, and teacher rights, and educational politics. Issues are treated from legal, sociological, and economic perspectives.

380 Independent Honors Research in Social Science Fall or spring. 1–6 credits. Limited to students who have met requirements for the honors program. S-U grades optional. A maximum of 6 credits may be earned in the honors program.

407 Teaching Elementary Science Fall. 3 credits. W 12:25–4:25. Staff.
An analysis and synthesis of science concepts and related behaviors for children and young adults, with emphasis on sequencing and instruction in schools and environmental centers. Includes an abbreviated weekly practicum in local public school classrooms.

411 Introduction to Educational Measurement Fall. 3 credits.
Present practices and theories of the measurement of human knowledge and performance. Students will be expected to acquire the practical skills of planning and constructing tests for a variety of purposes, interpreting and using test results, evaluating commercially available instruments, and the like. Students will also be expected to discuss issues of social, ethical, legal, and technical issues associated with educational testing. One course in statistics or concurrent registration in Education 352 is recommended but is not required.

413 Psychology of Human Interaction Fall. 3 credits. Enrollment limited. Prerequisite: permission of instructor. Fees: $35.
Designed to develop skills for, and understanding of, effective interpersonal communication and interaction. Appropriate for students in the helping professions, education, and areas involving management of human resources.

414 Counseling Psychology Spring. 3 credits.
Limited to 30 students. Prerequisites: introductory psychology, social or personality psychology, and Education 413.
The processes of counseling are examined from the perspectives of behavioral psychology and humanistic psychology. Research on adult development, college-age and older, is reviewed, and typical adult counseling issues are examined. Implications are drawn for counseling strategies with an adult population, including psychological assessment, establishing therapeutic goals, intervention strategies, and evaluation of outcomes. Alternative models of service delivery, such as outreach, consultation, and psychoeducation, are emphasized.

420 Field Experience Fall or spring. 1–4 credits. S-U grades optional. Undergraduates must attach to their course of enrollment material written permission from the faculty member who will supervise the work and assign the grade.
Staff.
Students may engage in planned, semiprofessional or professional practice in an educational enterprise. Each student prepares a plan of action including rationale, purposes, and procedures and arranges with a faculty member to supervise and evaluate the field experience.

430 Special Problems in Agricultural Education Fall, spring, or summer. 1–3 credits. S-U grades optional.
Fall and summer: hours to be arranged; spring: T 8:30. H. R. Cushman.
An opportunity to study individually selected problems in agricultural education.

432 Teaching Agriculture: Methods, Materials, Practice Fall. 9 credits. Prerequisite: Education 331 and concurrent registration in Education 430 and 434.
M T W R F 8–3. J. L. Berkey and staff.
Directed participation in teaching agriculture at the secondary school level. Program includes an intensive, four-week on-campus period, in which methods and materials of teaching agriculture are treated in detail, combined with a ten-week period in a student teaching center. Includes evaluation of area resources, instructional materials and facilities, development of curriculum, directing work experience, planning instruction, and advising youth organizations.

434 Adult Education Programs in Agriculture Fall. 3 credits. Prerequisite: concurrent registration in Education 430 and 434.
Lec to be arranged. H. D. Sulphin.
Determining instructional needs, planning programs of instruction, teaching in groups, giving on-the-job instruction, and evaluating adult education programs in agriculture.

444 Curriculum Design Fall. 3 credits. Education 644 may be taken concurrently.
A general practical approach to course planning. Readings, groups discussions, workshops, and individual conferences centering on each student's
project. This project consists of designing a course in a subject area for an age level and an institutional setting of the student's choosing.

447 Instructional Applications of the Microcomputer Spring. 1–3 credits.
The focus of this course is an introduction to microcomputer technology and the use of microcomputers in instruction and communication. Students select Modules A, B, and/or C. Module A addresses all the major application software packages, such as word processing, data base management, spreadsheets, communications, and instructional software. Module B addresses development and introduction to programming. Students propose special projects for Module C.

472 Philosophy of Education Fall. 3 credits.
A study of central issues in the philosophy of education. Questions of ethics, political philosophy, and the theory of knowledge are examined, and linked to current educational issues.

473 Contemporary Philosophy of Education Spring. 3 credits.
M 11:15, plus additional work to be arranged. D. B. Gowan.
The emphasis in this course is the architectonic meaning of a guide to philosophizing about education. Education is our topic. We begin with the fact that philosophers disagree, as do experts in all fields. Every discipline exhibits philosophical principles. The appeal to facts to settle disagreements fails because some philosophical principle is necessary to give meaning to facts. Philosophy concerns itself with problems we can neither solve nor abandon. Each year the readings in the course will change as we seek to use texts most up-to-date and also most fundamental in philosophy. Thus the course may be taken more than once. The curriculum is emergent.

477 Law and Educational Policy Fall. 3 credits.
An introduction to the use of legal concepts to study education and educational policy. Attention is given to the impact of education on male-female and black-white earnings differentials, economic growth, the distribution of earnings, and characteristics of the labor force. The concept of human capital is introduced and developed as a means of understanding these phenomena. Techniques of cost-benefit and cost-effectiveness analysis are used to shed light on current controversies regarding the effectiveness of alternative types of schooling.

481 Educating for Community Action Spring. 3 credits.
An introduction to the use of political principles to study education and educational policy. Attention is given to the impact of education on male-female and black-white earnings differentials, economic growth, the distribution of earnings, and characteristics of the labor force. The concept of human capital is introduced and developed as a means of understanding these phenomena. Techniques of cost-benefit and cost-effectiveness analysis are used to shed light on current controversies regarding the effectiveness of alternative types of schooling.

483 Comparative Studies in Adult Education Spring. 3 credits. S-U grades optional.
W 7:30–10:30 p.m. D. M. D. Bruce.
Focuses on the variety of adult education programs in countries around the world. Literature on comparative adult education, international conferences on adult education, UNESCO adult education publications, and international community development are analyzed in relationship to each student's exploration of adult education in a single country. Description of adult education in other countries is shared by international students.

497 Independent Study Fall or spring. 1–3 credits. S-U grades optional. Undergraduates must submit a course enrollment form to the education office for review. Students may undertake individual study under appropriate supervision. Each student is expected to review pertinent literature, undertake research under appropriate supervision, and prepare a report.

498 Undergraduate Teaching Fall or spring. 1 or 2 credits; 4 credits maximum during undergraduate career. Limited to students with grade-point averages of at least 2.75.

499 Undergraduate Research Fall or spring. 6 credits maximum during undergraduate career. Limited to students who have earned a 6 or more undergraduate research credits elsewhere in the college.
Staff.

547 Improvement of College Teaching Fall, spring, or summer. 2 credits. Prerequisite: Education 311 or 611 or permission of instructor.

590 Special Topics in Education Fall, spring, or summer. 1–3 credits. Prerequisite: permission of instructor. Limited to students with grade-point averages of at least 2.7.

591 Secondary Science Teaching Practicum Fall or spring. 3 credits. Prerequisite: Education 311 or 611.

592 Occupational Education Fall, spring, or summer. 2 credits. Prerequisite: Education 311 or 611.

601 Professional Education Fall or spring. 3 credits. Prerequisite: permission of instructor.

603 Teaching Mathematics Fall. 3 credits.

620 Internship in Education Fall or spring. 3 credits. Prerequisite: 603.

631 Theory and Methods for Education Fall. 3 credits. Prerequisite: Education 311 or 611 or permission of instructor.

635 Instructional Psychology Spring. 3 credits. Prerequisite: educational psychology S-U grades optional.

636 Special Problems in Agricultural and Occupational Education Fall or spring. 1–3 credits. S-U grades optional.

660 Seminar in Science and Mathematics Education Fall. 1 credit. S-U grades optional.
R 4:30. J. D. Novak and staff.

661 Educational Psychology Fall. 3 credits. Prerequisite: introductory psychology S-U grades optional.

676 Introduction to Psychological Testing Fall. 3 credits. Letter grades only. Not offered 1986–87.

547 Improvement of College Teaching Fall, spring, or summer. 2 credits. Prerequisite: Education 311 or 611 or permission of instructor.

590 Special Topics in Education Fall, spring, or summer. 1–3 credits. Prerequisite: permission of instructor. Limited to students with grade-point averages of at least 2.7.

592 Occupational Education Fall, spring, or summer. 2 credits. Prerequisite: Education 311 or 611.

593 Teaching Mathematics Fall. 3 credits.

596 Special Problems in Agricultural and Occupational Education Fall or spring. 1–3 credits. S-U grades optional.

598 Undergraduate Teaching Fall or spring. 1 or 2 credits; 4 credits maximum during undergraduate career. Limited to students with grade-point averages of at least 2.75.

599 Undergraduate Research Fall or spring. 6 credits maximum during undergraduate career. Limited to students who have earned a 6 or more undergraduate research credits elsewhere in the college.

615 Instructional Psychology Spring. 3 credits. Prerequisite: educational psychology S-U grades optional.

620 Internship in Education Fall or spring. 3 credits. S-U grades optional. Each student, before course completion and subject matter with the professor in charge.

621 Science Teaching Practicum Fall or spring. 3 credits. Prerequisite: permission of instructor. Limited to students with grade-point averages of at least 2.7.

622 Occupational Education Fall, spring, or summer. 2 credits. Prerequisite: Education 311 or 611.

623 Teaching Mathematics Fall. 3 credits.

624 Special Problems in Agricultural and Occupational Education Fall or spring. 1–3 credits. S-U grades optional.

625 Seminar in Science and Mathematics Education Fall. 1 credit. S-U grades optional.
R 4:30. J. D. Novak and staff.

626 Introduction to Psychological Testing Fall. 3 credits. Letter grades only. Not offered 1986–87.

627 Improvement of College Teaching Fall, spring, or summer. 2 credits. Prerequisite: Education 311 or 611 or permission of instructor.

628 Occupational Education Fall, spring, or summer. 2 credits. Prerequisite: Education 311 or 611.

629 Teaching Mathematics Fall. 3 credits.

630 Special Problems in Agricultural and Occupational Education Fall or spring. 1–3 credits. S-U grades optional.

631 Theory and Methods for Education Fall. 3 credits. Prerequisite: Education 311 or 611 or permission of instructor.

632 Occupational Education Fall, spring, or summer. 2 credits. Prerequisite: Education 311 or 611.

633 Teaching Mathematics Fall. 3 credits.

634 Special Problems in Agricultural and Occupational Education Fall or spring. 1–3 credits. S-U grades optional.

635 Instructional Psychology Spring. 3 credits. Prerequisite: educational psychology S-U grades optional.

636 Special Problems in Agricultural and Occupational Education Fall or spring. 1–3 credits. S-U grades optional.

637 Seminar in Science and Mathematics Education Fall. 1 credit. S-U grades optional.
R 4:30. J. D. Novak and staff.

640 Seminar in Science and Mathematics Education Fall. 1 credit. S-U grades optional.
R 4:30. J. D. Novak and staff.

641 Education for Community Action Fall. 3 credits.

642 Occupational Education Fall, spring, or summer. 2 credits. Prerequisite: Education 311 or 611.

643 Comparative Studies in Adult Education Spring. 3 credits. S-U grades optional.
W 7:30–10:30 p.m. D. M. D. Bruce.

644 Teaching Mathematics Fall. 3 credits.
Current research in mathematics education will be examined in order to develop a picture of the mathematics classroom that integrates subject matter, student conceptions, affective variables, and issues in the social context of learning mathematics. Special
The course provides an opportunity for graduate-level study of individually selected problems and issues in agricultural and occupational education. Designed for experienced teachers.

632 Teaching Agricultural and Occupational Education  Spring. 3 credits. Prerequisite: an introductory course in teaching methods or permission of instructor. M 6–9. A. L. Berkley.
The focus of the course is on the selection, use, and evaluation of methods and materials for teaching agricultural education. The course provides a significant opportunity to develop teaching competencies based on their individual needs and interests. Development of self-evaluation skills is included. A close look at the development of instructional materials is required.

633 Curriculum in Agricultural and Occupational Education  Fall. 3 credits. M 1:25–3:30; labs to be arranged. W. E. Drake.
Current situations affecting occupational education curricula are examined. Principles, objectives, and sources of information are developed for planning curricula. Strategies for developing occupational courses are examined. Consideration is given to planning, developing, and managing work experience programs. Participants have an opportunity to observe ongoing programs at the secondary and two-year college levels and to pursue individual interests in curriculum improvement.

643 Structure of Knowledge and Curriculum  Spring. 3 credits. Prerequisite: permission of instructor. M W 12:20–2:10. D. B. Goin.
Curriculum studies are the opening door to the four commonplaces of educating: curriculum, teaching, learning, and governance. A theory of educating explains the relations among these educational variables. Practice in concept mapping and Vee diagramming is required to achieve proficiency in curriculum analysis and curriculum construction. A theory and method for the analysis of the structure of knowledge is presented.

644 Curriculum Theory and Analysis  Fall. 3 credits. Prerequisite: Education 311 or 611, concurrent registration in Education 611, or permission of instructor. M W 10:10–11:30. G. J. Posner.
An examination of the basic elements involved in making curriculum decisions and an analysis of current approaches to curriculum. Students learn to analyze a curriculum in the context of a conceptual framework. This course is the basic graduate course in curriculum.

650 Methods of Educational Inquiry  Fall. 1–3 credits. Units b and c offered alternate years. Only unit a, for 1 credit, offered 1986–87. T R 2:30–4. J. Millman.
Techniques of empirical research are offered in three independent units: (a) survey of empirical approaches to social science inquiry, (b) design of educational research, and (c) methods of data collection. Course credit varies, depending upon the number of units the student elects. Units a, b, and c are covered during the first, second, and third thirds of the semester respectively.

Procedures for developing and writing a master's or doctoral thesis proposal. Emphasis will be given to identifying a significant topic, conducting and describing a group miniresearch study, recognizing weaknesses in illustrative proposals, and clear and concise writing. Students will be provided ample assistance in constructing a brief thesis proposal of their own.

The course will consist of three modules, each for one hour of credit. (1) Evaluation as a Programming Function. Fitting an evaluation to decision needs; program monitoring; evaluation and information systems. No prerequisite. (2) Evaluation Models. Comparison of evaluation models and their implications for practice. No prerequisite. (3) Program Evaluation. Directed practice in the design and conduct of a "live" evaluation. Prerequisite: module 1.

659 Special Topics in Research Methods  Spring. 2–3 credits. Prerequisite: permission of instructor. S-U grades optional. Hours to be arranged. J. Millman.
Consideration of new techniques and current topics in educational research design, measurement, or evaluation of programs, products, and personnel. The third unit of credit may be earned by students completing an individual project on a related topic.

661 Administration of Educational Organizations  Fall. 3 credits. W 3:35–6. E. J. Hailer and K. A. Strike.
Perspectives on the administration of educational organizations. Consideration of social science, legal and ethical theories, and their application to both public schools and higher education. Intended for students who are considering careers as educational administrators, as well as for those who want to further their understanding of schools as organizations.

An analysis of the distribution and utilization of public and private resources for educational purposes. The discussion will revolve around the issues of equity, efficiency, and freedom of choice. Alternative methods of financing schools will be evaluated, and the perplexing legal and moral issues raised by such questions as: "Who pays?" and "Who benefits?" will be discussed. Specific attention will be given to budgeting, accountability, and productivity. An opportunity for individuals to focus on their own areas of interest, such as occupational education, the two-year college, or secondary or higher education.

An analysis of the distribution and utilization of public and private resources for educational purposes. The discussion will revolve around the issues of equity, efficiency, and freedom of choice. Alternative methods of financing schools will be evaluated, and the perplexing legal and moral issues raised by such questions as: "Who pays?" and "Who benefits?" will be discussed. Specific attention will be given to budgeting, accountability, and productivity. An opportunity for individuals to focus on their own areas of interest, such as occupational education, the two-year college, or secondary or higher education.

An analysis of alternative purposes, nature, and scope of extension, adult, and continuing education programs in the United States and abroad, with emphasis on the relationship of programs to historical, cultural, political, and social settings. Definitions, conceptual controversies, philosophical issues, and current research directions will be examined through a seminar approach.

671 Designing Extension and Continuing Education Programs  Fall. 3 credits. Prerequisite: permission of instructor. T 2:30–4. D. L. Bruce.
Designed to help students understand the concepts, principles, and procedures relevant to developing programs and curricula for the continuing education of adults. The course is on the planning, financing, and administration of particular types of colleges and universities.

675 Community Education and Development  Fall. 3 credits. For students who have interest or experience in education or development programs in which community is an important concern. Not offered 1986–87. W 2:30–5. J. L. Compton.
An examination of the concept of community; changes in community life; the analysis of community; alternative strategies for community development; patterns of response to community by universities, colleges, schools, cooperative extension, and government service agencies; and such functional dimensions of community education as program planning; participatory decision making, volunteers, leadership development, council formation and function, interagency coordination, and change-agent roles.

693 Administration of Nonformal Education  Spring. 3 credits. Prerequisite: prior work experience preferred. W 12:00. G. J. Broadwell.
An overview of selected theories, principles, and strategies applicable to management of decentralized, professionally staffed, nonformal educational organizations and agencies. Content includes management functions, managerial leadership, management by objectives, and decision-making strategies. Particular attention is given to leadership of organizations with volunteer staff.
684 Adult Education Programs: Organization and Direction Fall. 3 credits. F 1:25-4:20. H. D. Supthin. Alternative procedural models for organizing and conducting adult occupational education courses are presented. Guidelines and procedures for implementing the models in secondary and postsecondary school settings are emphasized.


690 Research Seminar Fall or spring. No credit. M 4-5:30. J. P. Bail. Presentation of current research in the field of education by graduate students and staff. Opportunities to discuss methodology, findings, and other aspects of research.

711 Contemporary Issues in Educational Psychology Spring. 3 credits. S-U grades optional. M T 11:15-12:05, plus 1 hour to be arranged. J. A. Dunn. This is a graduate-level seminar dealing with key issues in contemporary psychology having implication for educational practice and research. Each student will prepare and present at least one lecture per term. Topics will vary from year to year. Students may take the course more than once.

715 Seminar in Psychology and Education Fall or spring. Variable credit. Prerequisite: permission of instructor. W 1:25-3:30. D. E. Hedlund. Selected topics focusing on the interaction of theoretical and research developments in psychology and education.

718 Adult Learning and Development Spring. 3 credits. Prerequisite: permission of instructor. S-U grades optional. M W 11:15-12:05, plus 1 hour to be arranged. R. E. Ripple, R. L. Bruce. Deals with adult development and learning behavior from points of view of educational psychology, social psychology, and sociolinguistics. Inferences are drawn from theory and research to the practice of adult continuing education. Appropriate for graduate students in educational psychology, extension and continuing education, and community service education and for others interested in adult learning and development.

730 Seminar in Agricultural and Occupational Education Spring. 2 credits. S-U grades optional. R 10-10. H. D. Supthin and staff. For master's degree candidates who have had teaching experience and doctoral candidates with majors or minors in agricultural and occupational education. Emphasis is on current problems and research. Includes discussion of student research proposals.

735 Teacher Preparation in Agriculture Fall. 3 credits. Prerequisite: teaching experience in agriculture. W 1:25-3:20. A. L. Berkey. For persons with teaching experience interested in the preparation of occupational teachers. Involvement in the Cornell program of teacher preparation in agriculture is expected.

736 Occupational Education Program: Administration and Supervision Spring. 3 credits. Not offered 1986-87. T 3:35-6; special sessions to be arranged. J. P. Bail. Practices and procedures for organizing, administering, and supervising programs of occupational education at the secondary and postsecondary level are stressed. The role of the director in providing leadership in improving instruction, designing programs, and using resources at federal, state, and local levels is considered.

739 Evaluating Programs in Occupational Education Spring. 3 credits. T 1:25-3:20, labs to be arranged. W. E. Drake. This course examines objectives, criteria, and strategies for evaluating programs of occupational education in secondary and postsecondary schools. Evaluation models, case studies, and evaluation work as a function of program planning are considered. Participants examine the roles of supervision in evaluation and have an opportunity to develop and apply evaluative instruments. Field trips and resource persons provide opportunities to observe actual evaluation problems and procedures.

745 Seminar in Curriculum Theory and Research Spring. 3 credits. Prerequisite: Education 445 and 644, or permission of instructor. Not offered 1986-87. W 9:05-11:30. G. J. Posner. Theoretical concepts in curriculum and appropriate areas for curriculum research are discussed.

750 Conceptual Problems in Educational Inquiry Fall. 3 credits. S-U grades optional. R T 12:00-2:10. D. B. Gowan. A constructionist view (as opposed to the conventional foundationalist viewpoint) of creating knowledge and value claims is the starting point of this seminar. We will be concerned with the conceptual principles (both normative and scientific) that guide research such that knowing and valuing are integrated in research. A view of theory-driven programmatic research is presented. Familiarity with master's and doctoral dissertation work of the past fifteen years at Cornell is expected. Copies are available in the libraries.

752 Organization and Management of Sponsored Research Fall. 3 credits. S-U grades optional. Offered alternate years. Not offered 1986-87. M W 11:15-12:05, plus 1 hour to be arranged. J. A. Dunn. Designed for doctoral students, advanced graduate students, and practicing researchers who have or expect to have responsibility for the promotion, management, or organization of sponsored research, development, or evaluation projects. The seminar is devoted to an in-depth review of the history of sponsored research, patterns of federal support, the federal process, the role of the principal investigator, research management, and futures analysis. Successful and unsuccessful proposals will be analyzed. Attention is given to alternative strategies for sponsored proposal development. This is not a thesis proposal seminar.

762 Research in Educational Administration Fall or spring. 3 credits. Prerequisite: one course in elementary statistics or permission of instructor. S-U grades only. Hours to be arranged. E. J. Haller. An analysis and critique of current research in educational administration. Discussion of research priorities and strategies in the conceptual area of educational governance. For graduate students interested in research on problems of educational governance. Students will carry out a small-scale empirical research project.

772 Seminar in Philosophy of Education Spring. 3 credits. Prerequisite: permission of instructor. S-U grades optional. Hours to be arranged. K. A. Strike. Topics to be announced.

782 Behavioral Change in International Rural Modernization Fall. 3 credits. For students who have interest or experience in international rural development or community development. J. L. Compton. An exploration of the social psychological aspects of socioeconomic development, focusing on individual modernity, values-beliefs-motives, achievement motivation, entrepreneurship, innovativeness, expectancies, and self-efficacy, and the applied orientations of indigenous learning and knowledge systems, adoption behavior under conditions of risk and uncertainty, appropriate social-educational-biomechanical technology, communication-diffusion of innovations, and development education.

783 Comparative Extension Education Systems Spring. 3 credits. Prerequisite: Education 782 or permission of instructor. R 1:25-4:25. J. L. Compton. Extension education in the developing nations is studied using, as an analytical frame of reference, a hypothetical model comprising such components as community organization, community-based learning, indigenous facilitators and leaders, extension generalists and specialists, training, and research-extension linkages. Case materials on alternative extension models and intercultural experiences provided an empirical base.

784 Technology-Focused Decision Making: Models for Extension Educators Fall. 3 credits. M T 12:30-2:30. R. Bruce, J. McGonigal. The educational and program management decisions involved in the adoption of educational technology in extension, rural development, and nonformal education programs are reviewed, and a variety of decision-making approaches is explored. An overall problem-solving method with case study illustrations is used. Consideration is given to structure and operating style of the educational organization, as well as to the characteristics of the technology under consideration. The course makes use of recent literature and continually updated files on current developments in technology applications.

800 Master's-Level Thesis Research Fall or spring. Credit to be arranged. S-U grades optional. Each student, before course enrollment, must obtain the approval of a faculty member who will assume responsibility for guiding the work.

900 Doctoral-Level Thesis Research Fall or spring. Credit to be arranged. Limited to students working on theses or other research and development projects. S-U grades optional. Each student, before course enrollment, must obtain the approval of a faculty member who will assume responsibility for guiding the work.

Related Course in Another Department

Historical Roots of Modern Psychology (Psychology 490)

Entomology

Courses by Subject

Apiculture: 260, 262, 264 
Behavior: 662 
Ecology: 370, 455, 457, 471, 664, 672 
Introductory courses: 200, 212

Medical entomology and pathology: 452, 453, 454 
Morphology: 322 
Pest management: 241, 343, 444, 640, 677 
Physiology and toxicology: 411, 483, 685, 690 
Systematics and acrology: 331, 332, 621, 630, 631, 633, 634, 636, 674, 710

200 Cultural Entomology Fall. 2 credits. Prerequisite: Biological Sciences 101 -- 102 (may be taken concurrently) or equivalent. Lect., W.F. 11:45; lab, M.T.W or R 2--4:25. J. K. Lieberherr. 

Introduces the science of entomology by focusing on basic principles of systematics, morphology, physiology, behavior, and ecology of insects. The laboratory in early fall includes field trips to collect and study insects in the natural environment. A small collection emphasizing ecological and taxonomic categories is required.

241 Applied Entomology Spring. 3 credits. Prerequisite: Biological Sciences 101--102 or equivalent. Lecs., T.R. 10:10; lab, M.T.W or R 2--4:25. E. M. Raffensperger. 

A compendium of the insects associated with crops and farm animals. Discussions of insect pest management requirements on farm and in garden, along with descriptions of control methods, materials, and equipment.


Introduces the fundamentals of practical beekeeping, including the life history, instincts, and general behavior of honey bees. The classical experiences on the dance language and the role of pheromones are reviewed. Some lectures are devoted to pollination of agricultural crops and the production of honey and beeswax.

262 The Biology of the Honey Bee Fall. 1 credit. Limited to 10 students. Prerequisite: permission of instructor. Labs, afternoons or weekends to be arranged; course will begin in September and October only. R. A. Morse. 

A series of laboratories in which students perform some of the classical experiments on honey bee behavior. Various techniques used in bee research are introduced.

264 Practical Beekeeping Fall. 1 credit. Limited to 20 students. Prerequisite: Entomology 260 (may be taken concurrently). Lab, W or R 2--4:25. R. A. Morse. 

This course consists of fourteen laboratory sessions to acquaint students with practical methods of colony management. Laboratories involve actual work with honey bee colonies and equipment. Some laboratories cover management of bees for apple pollination, honey harvesting and processing, and disease identification and control.

322 Insect Morphology Fall. 5 credits. Prerequisite: Entomology 212 or 241. Offered alternate years. Lecs., M.W.F 10:10; labs, M.F or T.R 1:25--4:25. G. C. Eckworth. 

An introduction to the external and internal anatomy of insects, with emphasis on the comparative and functional aspects. The laboratory is devoted largely to dissection.


332 Systematics Discussion Group Spring. 1 credit. Prerequisite: concurrent enrollment in Entomology 331 or permission of instructor. S-U grades only. Offered alternate years. 

Discussions, and analyses on topics in systematics coordinated with the lecture series in Entomology 331.

342 Special Topics in Economic Entomology Hours to be arranged. Staff. 

Topics to be announced.

370 Pesticides in the Environment (also Toxicology 370) Fall. 2 credits. Prerequisites: Biological Sciences 101 -- 102 or equivalent. Not offered 1986--87. Lecs., T.R. 9:05. 

A survey of the different types of pesticides, their uses, their distribution in the environment, and their effects on various components of the environment. For students whose main emphasis is not in pesticide usage.

411 Comparative Neuroendocrinology (also Biological Sciences 411) Spring. 3 credits. Prerequisites: Biological Sciences 311 or Entomology 483. 


A comparison of the interaction of the nervous and endocrine systems in vertebrates and invertebrates. Areas covered include morphological development, evolution, physiology, and molecular biology of neuroendocrine glands and their hormones.

441 Seminar in Insect Pest Management Spring. 1 credit. Limited to 10 students. Prerequisite: Entomology 241 or 444 or permission of instructor. S-U grades only. Not offered 1986--87. Hours to be arranged. Staff. 

Discussion of current topics in pest management, with an emphasis on insect pest management. 


For students preparing for careers in horticulture, urban forestry, and pest management. Deals with the nature, diagnosis, assessment, and treatment of diseases and arthropod pests of trees and shrubs. Forest, shade, and ornamental plants are considered.

444 Integrated Pest Management (also Plant Pathology 444) Fall. 4 credits. Prerequisites: Biological Sciences 260 or 360, Entomology 212 or 241, and Plant Pathology 301 or their equivalents or permission of instructor. Lecs., M.W.F. 9:05; lab, M or W 1:25--4:25. P. A. Amerson. 

Lectures integrate the principles of pest control, ecology, and economics in the management of pest-crop systems. Laboratories consist of exercises to reinforce concepts presented in lecture and demonstrate pest monitoring techniques and the application of computer technology to management problems.

452 Medical Entomology Fall. 3 credits. Prerequisites: Entomology 212 or permission of instructor. Offered alternate years. Lecs., T.R. 10:10; lab, R. 1:25--4:25. E. W. Cupp. 

A survey of arthropods of public health and veterinary importance, with emphasis on transmission dynamics of pathogens, biomorics of vector populations, and current control concepts. Morphology and taxonomy of selected groups are examined in the laboratory, with additional exercises in vector-pathogen relationships and epidemiological techniques.

453 Insect Pathology Spring. 4 credits. Prerequisites: Entomology 212 or 241 or permission of instructor. Recommended: a course in microbiology. Offered alternate years. Lecs., W.M.W 10:10, lab, R. 1:25--4:25. J. P. Kramer. 

A survey of the diseases of insects caused by viruses, bacteria, fungi, and protozoans and a consideration of the role of microbial diseases in natural and applied insect control. Laboratory investigations center around living insect—pathogen associations and the consequences of these associations for both insect and microbe.


Presentations, discussions, and analyses of current topics by the participants. Focus centers on microbial diseases of insects.

455 Insect Ecology, Lectures (also Biological Sciences 455) Fall. 2 credits. Prerequisites: Biological Sciences 261 and Entomology 212 or their equivalents. Offered alternate years. Not offered 1986--87. 


Ecological and evolutionary principles are integrated by thorough examination of outstanding investigations. Topics discussed include the factors responsible for the great diversity of insects, adaptive syndromes associated with climate, natural history of arthropod guilds, impact of insects on terrestrial vegetation, pest control, population regulation, and the contrast between natural and managed ecosystems.

457 Insect Ecology, Laboratory (also Biological Sciences 457) Fall. 2 credits. Limited to 16 students. Prerequisite: concurrent enrollment in Biological Sciences 455. Offered alternate years. Not offered 1986--87. Labs, W: 1:25--4:25; F for S field trips to be arranged during the field season. R. B. Root. 

Field exercises focus on insect natural history and methods of sampling populations. Laboratories devoted to rearing insects, estimating life-table parameters, and analyzing communities.

471 Freshwater Invertebrate Ecology and Systematics Fall. 4 credits. Prerequisite: Entomology 212. Recommended: Biological Sciences 261 or 262, and 462 or 464. 


One evening pre-lim. B. L. Peckarsky. 

The lecture explores the life histories, behavior, feeding ecology, and limitations to distributions of macroscopic freshwater invertebrates with an emphasis on insects. The laboratory involves field collections and laboratory investigations of invertebrates and their use of keys. Students may elect to conduct ecological field projects or to study the systematics of freshwater invertebrates in more depth.

483 Insect Physiology Spring. 4 credits. Prerequisite: Entomology 212. Not offered 1986--87. 


An introduction to the often unique ways that insects have met their basic needs. Each organ system is examined with emphasis on basic principles and specific examples. The student will also be introduced to some common methods in physiological research and to the critical reading of scientific literature.
Special Topics for Undergraduates  
Fall or spring. Credit to be arranged. Prerequisite: permission of instructor. Undergraduates must attach to their course enrollment material written permission from the staff member who will supervise the work.

Undergraduate Research  
Fall or spring. Credit to be arranged. Prerequisite: permission of instructor. Undergraduates must attach to their course enrollment material written permission from the staff member who will supervise the work.

Acrology  
Fall. 4 credits. Prerequisites: Entomology 212 and permission of instructor. Offered alternate years. Not offered 1986-87. Lec, M W 10:10; labs, M W 1:25-4:25. G. C. Eickwort. An introduction to the taxonomy, morphology, and biometrics of mites and ticks; with emphasis on taxa of economic importance. A collection is required.

Field Entomology  
Spring. 2 credits. Prerequisites: Entomology 331 and permission of instructor. S-U grades optional. Hours to be arranged. J. K. Liebherr, Q. D. Wheeler. The course will be comprised of weekly meetings and an intensive two-week field trip. Evening meetings before the field trip will orient participants to selected field sites, which will then be surveyed using advanced collecting techniques. After the trip, material will be processed for inclusion in the Cornell University Insect Collection. Students will be responsible for food costs while traveling to and from the field sites.

Systems of the Coleoptera  

Systems of the Diptera and Hymenoptera  
Spring. 3 credits. Prerequisite: Entomology 331. Offered alternate years. Lec and two labs, hours to be arranged. W. L. Brown. Lectures on the classification, evolution, and biornics of the Diptera and Hymenoptera. Laboratory studies on the literature, characteristics, and classification of representative genera and species of these orders, based on adult and immature stages.

Special Topics in Systematic Entomology  
Fall or spring; taught on demand. 2-4 credits. Prerequisite: permission of instructor. Hours to be arranged. Staff. Discussion of current topics in systematic entomology. Topics to be announced, including current theoretical issues in insect classification, evolution, and biogeography.

Pest Management: Quantitative Aspects  
Fall. 3 credits. Prerequisites: Entomology 444 and a course in calculus. Recommended: an introductory course in computer science. S-U grades optional. Offered alternate years. Not offered 1986-87. Lec and disc, TR 10-12; 15. Staff. Quantitative aspects of the development of pests and agricultural resource management systems. Systems analysis, modeling and simulation, sampling, quantitative biological research, and economics are covered in lectures. Discussions of philosophical issues and current and classical literature.

Insect Behavior Seminar  
Spring. 2 credits. Prerequisites: permission of instructors and Entomology 212 and Biological Sciences 321 or equivalents. S-U grades optional. Offered alternate years. Hours to be arranged. G. C. Eickwort, M. J. Jauber.

Insect-Plant Interactions Seminar (also Biological Sciences 664)  
Spring. 2 credits. Limited to 15 students. Prerequisites: entomology, ecology, evolution, organic chemistry, and written permission of instructor. S-U grades optional. Offered alternate years. One evening a week, to be arranged. P. P. Foeery. For graduate students and seniors. Presentations and discussions by students on the evolution of patterns of interaction between plants and insects, emphasizing critical evaluation of concepts and evidence.

Seminar in Aquatic Ecology  
Fall. 1 credit. Prerequisite: permission of instructor and either Entomology 326 or Biological Sciences 462, 464. Offered alternate years. Hours to be arranged. B. L. Peckarsky. Discussion and analysis of current topics in the ecology of streams and lakes, including synthesis of key papers in the literature. Reports on personal research or ideas by students are encouraged.

Principles of Systematics (also Biological Sciences 674)  
Spring. 4 credits. Prerequisite: Entomology 331 or introductory systematics course in another field of biological sciences. Offered alternate years. Not offered 1986-87. Lec-disc-labs, M W 1:25-4:25. Staff (Q. D. Wheeler, coordinator). An introduction to modern theory and methods of systematic biology. Lectures, readings, and discussions on the theoretical, historical, and practical aspects of the subject, including species concepts, classification, phylogenetic systematic principles, and biogeography. Laboratories include various methods of analysis of data (e.g., cladistic hand and computer methods, numerical methods). Part of the grade is based on a final paper.

Biological Control  
Fall. 3 credits. Prerequisites: Entomology 4, Entomology 212, Biological Sciences 261, and permission of instructor. Offered alternate years. Not offered 1986-87. Lecs, TR 9:05; lab, T 2-4:25. M. J. Jauber. Theory and method of biological control of anthropod pests and weeds. Laboratory includes studies with living parasitoids and predators.

Seminar in Insect Physiology  
Spring. 1 credit. Prerequisite: permission of instructor. Hours to be arranged. H. H. Hagedorn.

Insect Toxicology and Insecticidal Chemistry (also Toxicology 690)  
Spring. 4 credits. Prerequisites: general chemistry and organic chemistry. Undergraduate students by permission of instructor. Offered alternate years. Lecs, M W 9:05; lab, day to be arranged. 1:25-4:25. J. G. Scott. The chemistry of insecticides and their metabolism and mode of action in insects and mammals.

Special Topics for Graduate Students  
Fall or spring. Credit to be arranged. Prerequisite: permission of instructor. Not for thesis research. Staff.

Graduate Research  
Fall or spring. Credit to be arranged. Prerequisite: permission of instructor. Not for thesis research. Staff.

Teaching Entomology  
Credit to be arranged. Staff. Teaching entomology or for extension training.

Curation in Entomology  
Fall or spring. Credit to be arranged. Prerequisite: permission of instructor. S-U grades only. Hours to be arranged. J. K. Liebherr and staff. The range of curatorial techniques required to operate an institutional insect collection will be investigated with working with staff. Curation of a specific taxon of interest will comprise part of the course of study.

Master's-Level Thesis Research  
Credit to be arranged. Prerequisite: permission of instructor. S-U grades optional. Staff.

Doctoral-Level Thesis Research  
Credit to be arranged. Prerequisite: permission of instructor. S-U grades optional. Staff.

Jugatae Seminar  
Fall and spring. A seminar conducted by Jugatae, the entomology club of Cornell University, to discuss topics of interest to its members and guests.

Fioriculture and Ornamental Horticulture  

Courses by Subject

Commercial floriculture crop production: 424, 425
Freehand drawing and illustration: 109, 111, 210, 211, 214, 318, 417
Horticultural physiology: 401, 402, 601
Introductory courses: 100, 105
Landscape architecture (professionally accredited program): see the section "Landscape Architecture"
Landscape horticulture: Landscape Architecture 140, 205, 220, 311, 312, 521, 522
Nursery management: 421
Plant materials: 210, 312, 313, 322, 342, 450
Retail floriculture: 105, 325
Special topics in floriculture and ornamental horticulture: 497
Turfgrass management: 314, 318
Introduction to Floriculture and Ornamental Horticulture  
Fall. 3 credits.

Lecs, TR 11-15; lab, W 2-4-25. C. F. Gortzig. An introduction to floriculture, landscape horticulture, and related horticultural professions and businesses. Emphasis is on the history, geography, and literature of the field: the structure and organization of the component industries, institutions and professions; and the role of science and technology in the continuing development of horticultural practice. A one-day field trip is taken to historical horticultural sites.

Floral Design: Introduction  
Fall or spring. 2 credits. Each studio is limited to 22 students. Prerequisite: permission of instructor; preference given to plant science majors, then to students in education, design, and journalism. Charge to purchase instructional plant materials that the student will keep. $50. Enrolled students who do not attend the first session and fail to notify the secretary in Plant Science room 20 of their absence will automatically be dropped.

Courses by Subject
for varying themes and occasions. Other aspects include selection, preparation, and factors affecting keeping quality of plant materials. Emphasizes the economical use of all supplies.


A beginning course with emphasis on the drawing of natural forms and landscapescapes. Of particular interest to students in floriculture and ornamental horticulture, landscape architecture, biological sciences, nature education, etc. Outside field notebook assignments.

111 Freehand Drawing Fall or spring. 3 credits. Each section limited to 25 students. S-U grades optional. Credit may not be received for both Floriculture 109 and 111.


Developing accuracy of observation and a personal graphic vocabulary. Freehand perspective and its uses in establishing design and spatial relationships, practice in figure and landscape drawing, form vs. value drawing. Weekly outside sketchbook assignments.


Practise in outdoor architectural sketching, primarily in watercolor, but including pen and ink, pencil, and colored pencil. Studio will develop working sketches into complete renderings. Principles of perspective are taught and applied to the student who wishes to develop skill in handling watercolor. Outside-of-class sketchbook work required.

211 Freehand Drawing and Illustration Fall. 2 credits. Prerequisite: Floriculture 111 or equivalent. S-U grades optional. 6 studio hours scheduled in 2- or 3-hour units between 9:05—12:05. M T W R F R. J. Lambert.

Progression to the organization of complete illustrations. Subject matter largely from sketches, still life, and imagination. Composition, perspective, and ways of rendering in different media are considered.

213 Woody Plant Materials Spring. 4 credits. Fee for lecture-laboratory manual. £20.


214 Watercolor Spring. 2 credits. Prerequisite: Floriculture 111 or equivalent. S-U grades optional. 6 studio hours scheduled in 2- or 3-hour units between 9:05—12:05. M T W R F R. J. Lambert.

A survey of watercolor techniques. Subject matter largely still life, sketchbook, and on-the-spot outdoor painting.

228 Floral Design: Intermediate Spring. 2 credits. Prerequisite: Floriculture 105 or permission of instructor; preference given to students planning a career in retail horticulture. $50 charge to purchase instructional plant materials that the student will keep. Studio, W 1:25—4:25. C. C. Fischer.

An advanced study of the art of floral design. The students assist in designing the setting themes and occasions for floral display during the semester.

312 Garden and Interior Plants I Fall. 3 credits. Fee for lecture-laboratory manual. £20.


A study of ornamental plants used in garden and interior situations. The first seven weeks cover primarily herbaceous annuals and perennials, with the laboratory devoted to various practical gardening activities. The remainder of the semester covers the major kinds of foliage and flowering plants used in the home and other interior landscape situations. Emphasis is on identifying them, use, and general cultural requirements.

313 Woody Plant Materials for Landscape Use Fall. 3 credits. Limited to 30 students. Primarily for landscape architecture majors. Fee for lecture-laboratory manual. £20.


A study of the trees, shrubs, vines, and ground covers used in landscape plantings in the northeastern United States. Emphasis is on leaf identification and on characteristics that determine their usefulness as landscape subjects.

314 Turfgrass Management Fall. 3 credits. Prerequisites: Agronomy 260. Recommended: Biological Sciences 242 and 244 or permission of instructor. Fee for lecture-laboratory manual. £20.


A study of the scientific principles, practices, and materials for the construction and maintenance of lawn, sports, and utility turfgrass. Environmental effects on growth are also studied.

316 Advanced Drawing Fall or spring. 2 credits. Prerequisite: Floriculture 211 or permission of instructor. S-U grades optional.

6 hours to be arranged. A. Elliot or R. J. Lambert.

For students who want to attain proficiency in a particular type of illustration or technique.

318 Advanced Turfgrass Management Fall. 2 credits. Prerequisites: Floriculture 314 or equivalent, and permission of instructor. Fee for lecture-laboratory manual. £20.

A continuation of Floriculture 314, with emphasis on applying scientific principles to management of golf courses, athletic fields, parks, industrial grounds, and sod production.

322 Garden and Interior Plants II Spring. 3 credits. Prerequisite: Floriculture 312 or permission of instructor. Fee for lecture-laboratory manual. £20.


A continuation of Floriculture 312: The first seven weeks are devoted to a further study of interior plants, with emphasis on specific groups of interior plants such as orchids, cacti and succulent, gesneriads, ferns, palms, and bromeliads. The second seven weeks are devoted to outdoor herbaceous plants such as tulips, daffodils, crocus, and iris, as well as other spring-flowering bulbs and perennial plants. Outdoor laboratories emphasize practical gardening activities appropriate to the spring season.

325 Flower-Store Management Fall. 3 credits. Prerequisites: Floriculture 105 and permission of instructor. Laboratory materials charge, $50. Cost for field trips, $20 plus room and meals.


Lectures devoted to flower-shop management, business methods, merchandising, and marketing of floricultural commodities. Laboratories include the application of subject matter and the principles of commercial floral arrangement and design. Required field trips made to flower shows and to wholesale and retail florist establishments.

342 Taxonomy of Cultivated Plants (also Biological Sciences 342) Spring. 4 credits.


A study of the genera and species of cultivated plants, their relationships, and their classification into families and genera, emphasizing cultivated plants. Emphasis is on gaining proficiency in identifying distinguishing families and in preparing and using dichotomous keys. Attention is also given to the economic importance of taxa, to the basic taxonomic literature, and to the elements of nomenclature.

401 Principles of Plant Propagation Fall. 3 credits. Prerequisite: Biological Sciences 242 and 244 or another course in plant physiology. A field-trip fee will be charged.


Propagation of plants using vegetative techniques including cutting, graftage, tissue culture, and propagation from seed. Physiological, environmental, and anatomical principles are stressed rather than hands-on techniques. Emphasis includes horticultural, agronomic, and forestry crops.

402 Physiology of Horticultural Plants Spring. 4 credits. Prerequisites: Biological Sciences 242 and 244, 241 or permission of instructor. M W F 8; lab to be arranged. F. B. Negm.

A study of the physiology of growth and development of horticultural plants in response to their environment.

417 Scientific Illustration Fall. 2 credits. Prerequisite: Floriculture 211 or 316 or equivalent. S-U grades optional for graduate students only.

With a minimum of 8 studio hours scheduled between 9:05 and 12:05. M W F A. Elliot.

A survey of methods of illustration. Training in techniques of accurate representation in media suitable for reproduction processes, including pen and ink, scratchboard, wash, and mixed media.

421 Principles of Nursery-Crop Production Fall. 4 credits. Limited to 40 students. Preference given to juniors. Prerequisites: Floriculture 401 and Biological Sciences 242 and 244, or 342 (may be taken concurrently), or equivalent; or permission of instructor. Cost for field trip and special laboratory supplies, $25.

Lecs, M W F 9:05; lab, R 2:25—4:25. T. C. Weiler.

A study of commercial production of florist crops with emphasis on their culture as influenced by greenhouse environment. Three field trips are made to commercial greenhouses.

424 Principles of Florist Crop Production Spring. 4 credits. Limited to 40 students. Preference given to seniors. Prerequisites: Floriculture 401 and Biological Sciences 242 and 244, or 342 (may be taken concurrently), or equivalent; or permission of instructor. Cost for field trip and special laboratory supplies, $25.


A study of commercial production of florist crops with emphasis on their culture as influenced by greenhouse environment. Three field trips are made to commercial greenhouses.

425 Greenhouse Production Management Spring. 4 credits. Primarily for seniors. Prerequisite: an elementary course in horticulture or equivalent. Cost of field trips, $30.

Lecs, T R 10:10—12:05. Two field trips.

R. W. Langhans.

Intended to provide the latest information on efficient operation and administration of a commercial greenhouse, outside the sphere of production methods for specific crops. Consideration is given to the industry, centers of production, competition, location, types of structures, heating, ventilation, cooling, fertilizing, watering systems, and business analysis and management.

450 Special Topics in Ornamental Plants Fall or spring. Credit to be arranged. Primarily for upperclass floriculture and ornamental horticulture majors. Prerequisites: Floriculture 213, 312, 313, or the equivalent, and permission of instructor.

Hours to be arranged. R. G. Mower.

Topical subjects in plant materials. Independent study of general topics or specific plants using evaluative textbooks. The topic is given in the supplementary announcement.

497 Independent Study in Floriculture and Ornamental Horticulture Fall or spring. 1 or more credits; may be repeated for credit. S-U grades optional.

Prerequisite: A student must satisfy the faculty requirement.
member with whom he or she will work that his or her background warrants the choice of project. Undergraduates must attach to their course enrollment written permission from the faculty member who will supervise the work and grade the project.

Faculty
Individual or small-group study and special projects in floriculture, ornamental horticulture, and related areas.

501/502 Master of Professional Studies (Agriculture) Project Fall or spring. 1–6 credits. S-U grades optional. Hours to be arranged. Graduate Faculty
A comprehensive project emphasizing the application of floricultural and ornamental horticultural principles and practices to professional horticultural teaching, extension, and research programs and situations. Required of Master of Professional Studies (Agriculture) candidates in the Field.

600 Seminar Fall or spring. Open for credit to department faculty and graduate students. S-U grades only. R 12:20. Leader: N. L. Bassuk.

601 Current Topics in Floricultural and Orbamental Horticultural Physiology Spring. Variable credit. Prerequisite: permission of instructor. Hours to be arranged. F. B. Negm.
Discussions of recent concepts, research, and commercial problems as reflected in current horticultural literature.

Landscape Architecture

100 Landscape Architecture Freshman Orientation Fall. 1 credit. Limited to freshman majors. S-U grades only. T 2–4. M. I. Adleman.
Introduction to resources supporting Landscape Architecture at Cornell.

140 Landscape Design Studio Spring. 4 credits. Limited to approximately 20 students; primarily for landscape horticulture majors and freshman landscape architecture majors. Prerequisite: permission of instructor. T R 1:25–4:25. D. W. Krall.
Fundamentals of landscape design applied to residential and other small-scale site-planning projects. Work in the studio introduces design process, site design principles, construction materials, planting design, and graphics.

201 Theory and Application Studio Fall. 6 credits. Limited to landscape architecture majors. Cost of basic drafting equipment and supplies, about $200; expenses for field trip, about $200. M W F 1:25–4:25. Required field trip. M. I. Adleman.

202 Project Design and Site-Planning Studio Spring. 6 credits. Prerequisite: LA 201 with a grade of C or better. Cost of field trip, about $200. M W F 1:25–4:25. H. T. Johnson.
Site design and planning for parks, housing, and architectural ensembles. Basic theory, historic precedents, and the design process are correlated with garden landscapes, open-space systems, earth form, vegetation, and circulation systems.

205 Graphic Communication Fall. 3 credits. Prerequisite: concurrent enrollment in LA 201 or LA 501 or permission of instructor. Cost of supplies, about $30. Lecs, T R 9:05–11. H. T. Johnson.
Basic skills in graphic presentation, including pencil- and ink-drawing and drafting techniques applicable to landscape architecture projects. Freehand drawing, orthogonal projection, axonometric projection, and lettering are covered in the course.

220 Principles of Spatial Design Fall. 3 credits. Lecs, M W 10:10; disc, F 10:10. R. T. Trancik.
Basic principles involved in design theory, interpretation, and methodology as they are applied to shaping the outdoor environment. Students are introduced to spatial design vocabularies for a variety of environmental scales and spatial types.

301 Natural Systems and Planting Design Studio Fall. 6 credits. Prerequisite: LA 202 with a grade of C or better. Cost of drafting supplies, about $100; expenses for field trip, about $200. M W F 1:25–4:25. Required field trip. D. W. Krall.
The application of planning processes and techniques at a regional scale, examining the management of landscape units using state-of-the-art methodologies. Projects will highlight planting design principles focusing on the functional, ecological, and aesthetic use of vegetation in the landscape.

302 Urban Systems Studio Spring. 6 credits. Prerequisite: LA 301 with a grade of C or better. Cost of drafting supplies, about $100. M W F 1:25–4:25. L. Minir.
Projects in landscape architecture at the site scale as determined by constraints and opportunities of an urban environment. Emphasis on integration of site and historical analysis in formulation of physical design solutions.

310 Site Construction I Spring. 4 credits. Prerequisite: permission of instructor. Lecs, M W 9:05; studio, T R 9:05–11. P. J. Towbridge.
Construction materials, specifications, cost estimates, and methods used by landscape architects in project implementation. The course includes construction demonstrations, lectures, studio problems, and construction documentation for a selected project.

312 Site Construction II Spring. 4 credits. Prerequisite: LA 310 with a grade of C or better. Lecs, T R 10; studio, M F 10:10–12:35. M. I. Adleman.
Site engineering for landscape architects, including advanced site grading, earthwork calculations, site layout, horizontal and vertical road alignment, storm-water management, site irrigation, and site utility systems.

Examination of the landscape architectural profession, including office practices and organization, the client-practitioner relationship, and documentation for project proposals and job specifications. Class format includes guest lecturers and field trips.

401 Advanced Project Design and Graphics Studio Fall. 6 credits. Prerequisite: LA 205 with a grade of C or better and LA 302 or the Denmark studio with a grade of C or better. Cost of supplies, about $100; basic expenses for field trip, about $200. M W F 1:25–4:25. Required field trip. R. T. Trancik.
A sequence of projects introducing students to advanced skills in spatial design and three-dimensional graphic representation, including perspective construction, rendering techniques in different media, value delineation, and the use of color.

402 Senior Project Studio Spring. 6 credits. Prerequisite: LA 401 with a grade of C or better. Cost of supplies and reproductions, about $200. M W F 1:25–4:25. M. I. Adleman.
Site design and construction development developed for specific project as an evaluation of each student’s professional competency in landscape architecture.

490 Special Topics in Landscape Architecture Fall or spring. 1–3 credits; may be repeated for credit. S-U grades optional. Staff.
Topical subjects in landscape architectural design, theory, history, or technology. Group study of topics not considered in other courses.

497 Independent Study in Landscape Architecture Fall or spring. 1–5 credits; may be repeated for credit. S-U grades optional. Staff.
Work on special topics by individuals or small groups.

500 Graduate Orientation Seminar Fall. 1 credit. S-U grades only. D. W. Krall.

501 Theory and Application Studio Fall. 6 credits. Limited to graduate students. Cost of basic drafting equipment and supplies, about $200; expenses for field trip, about $200. M W F 1:25–4:25. Required field trip. L. Minir.
Introduction to basic concepts of site analysis and physical design of the landscape. Exercises and projects explore the relationship between natural features, functional demands, professional tradition, and the creation of spatial form.

The studio will focus on the spatial design of project-scale site development. Students will develop their expertise in applying the design theory, vocabulary, and graphic expression introduced in LA 501.

520 Contemporary Issues in Landscape Architecture Fall. 2 credits. L. Minir.

521 History of Landscape Architecture I Fall. 3 credits. L. Minir.

522 History of Landscape Architecture II Spring. 3 credits. L. Minir.

531 Regional Landscape Planning I Fall. 4 credits. Prerequisite: permission of instructor. Lecs, T R F 9:05 plus 1 hour to be arranged. A. S. Lieberman.
Landscape-ecology as a basis for regional landscape planning. Regional landscape planning strategies and methods that have been developed and employed in North America, Europe, Australia, and the Middle East. This course is intended to provide a basis for understanding the utilization of landscape ecological knowledge in the planning process. It is presented through a series of lectures, readings, class discussions, exercises, and review of case studies. The course is directed to graduate students in landscape architecture, architecture, city and regional planning, ecology, international studies, international agriculture and rural development, and natural resources.

Vegetation analysis techniques and methods applied to comprehensive land-use planning and consideration of the environmental uses of plants in regional landscape planning. Landscape functions of vegetation at the regional scale reviewed in case studies in North America, Europe, the Middle East, and Australia.

An application of design and planning methods within large physiographic or political units. Course participants will be engaged in the use of soil maps, aerial photographs, remote-sensed images, census data, and techniques for manipulating large, complex data bases.

*Offered through the College of Architecture, Art, and Planning
Food Science

602 Urban Systems Studio Spring. 6 credits. Limited to graduate students. Cost of drafting supplies, about $100.
Application of urban-design and town-planning techniques to specific contemporary problems of city environments. Issues of urbanism are investigated and applied to physical design interventions and spatial typologies involving the street, square, block, garden, and park systems. Urban land-use development and public and private implementation of urban-design plans are examined. This is a specially arranged collaborative studio with the Department of City and Regional Planning.

*621 Summer Internship Seminar Fall. 2 credits. L. Mirin.

634 Landscape Architectural Research Spring. 3 credits.
An introduction to general research methods and to the diversity of landscape architectural research. Focus will be on practical, descriptive, qualitative, and archival methods as a bridge between the design professions and the traditional research professions.

690 Independent Study in Landscape Ecology and Regional Landscape Planning Fall. 1-3 credits. Limited to 7 students. Prerequisite: permission of instructor. S-U grades optional.
A. S. Lieberman.
This course is designed for students who have taken LA 531 so they can engage in advanced readings and research in the human ecosystem science of landscape ecology, as well as for other students who wish to gain familiarity with the conceptual and practical tools offered by landscape ecology. Open to graduate students in landscape architecture, city and regional planning, ecology, international studies, international agriculture and rural development, and natural resources. This will allow course participants to engage in research or study leading to thesis preparation.

701 Advanced Project Design Studio Fall. 6 credits. Limited to graduate students. Cost of supplies, about $100; expenses for field trip, about $200.
Advanced studio linking master planning and detail design sequences while including diverse issues such as design research, project management, and environmental impact.

800 Master's Thesis in Landscape Architecture Fall or spring. 9 credits.
Hours to be arranged. Staff.
Independent research, under faculty guidance, leading to the development of a comprehensive and defensible design or study related to the field of landscape architecture. Work is expected to be completed in final semester of residency.

Food Science

J. R. Stouffer, R. R. Zall

100 Introductory Food Science Fall. 3 credits.
M W F 10-10. N. N. Potter.
A comprehensive introduction to food science and technology—its scope, principles, and practices. Topics are constituent properties; methods of preservation; the major food groups, including their handling and processing; and current problems such as chemical additives and world feeding needs. Interrelationships between chemical and physical properties, processing, nutrition, and food quality are stressed.

101 Topics in Food Science Fall. 1 credit. Limited to food science majors taking Food Science 100.
Prerequisite: Food Science 100. A required companion course to Food Science 100.
Lec and disc. F 11:15. N. N. Potter and staff.
Members of the staff lecture and lead discussion on selected topics.

150 Food Choices and Issues Spring. 2 credits.
S-U grades optional.
Deals with our nutritional needs and the nutrient content of foods. Issues pertaining to diets, food processing, quality, and safety are discussed.

210 Food Analysis Spring. 3 credits. Prerequisite: Chemistry 104 or 208.
Designed to acquaint the student with chemical tests used by food analysts. Emphasis is on understanding and use of good analytical techniques, including gravimetric, volumetric, and spectrophotometric methods. Procedures for screening, routine quality control, and official tests for fats, proteins, carbohydrates, and selected minor nutrients are introduced.

220 Food Science for Industry Fall. 2 credits. Lec and lab. F 1:20-4:25. Field trips. R. C. Baker.
Provides understanding of food industry operations. Half the laboratories are production of food products with such causative agents as pathogens, and half are visits to commercial plants producing those products. One or two longer field trips will be offered.

247 Postharvest Food Systems Fall. 2 credits. Prerequisite: freshman chemistry. Recommended: Food Sciences 100. S-U grades optional.
This interdisciplinary course describes various causes of postharvest food losses in developing countries and methods available to reduce the losses. Designed for all students in agriculture. Emphasis on unprocessed and minimally processed foods such as cereal grains, fresh fruits, and vegetables. Social, economic, and microbiological aspects of these problems are stressed.

301 Nutritional Aspects of Raw and Processed Foods (also Nutritional Sciences 301) Spring. 3 credits. Prerequisites: Nutritional Sciences 115 and 151, and organic chemistry or permission of instructor.
An evaluation of the nutritional qualities of human foods, with emphasis on changes that occur during processing and storage. Methods and approaches for nutritional evaluations, including nutrient composition, nutrient density, nutrient quality, and nutrient bioavailability measurements, are discussed. Other topics include nutrient stability, nutrition labeling, descriptions of the composition and nutritional role of selected commodities, food fortification, and food additives.

304 Food Sanitation as Related to Public Health, Food Plant Processing, and Quality Assurance Programs Spring. 3 credits. Prerequisite: Food Science 100.
Deals with measures essential in producing and processing wholesome and safe foods. Rules and regulations of the Food and Drug Administration, the U.S. Department of Agriculture, and other organizations important to the food industry are covered. Field trips and invited speakers are selected to demonstrate the use of sanitary principles.

311 Milk and Frozen Desserts Fall. 2 credits. Prerequisite: Food Science 322 or permission of instructor. Offered alternate years.
Lec, W 12:20; lab, W 1:25. R. R. Zall and staff.
Deals with the principles and practices of processing fluid milk products and frozen desserts. The chemical, microbiological, and technological aspects of processing these dairy products are considered. Field trips to processing plants supplement the lectures and laboratory work.

312 Technology of Poultry, Fish, and Other Meats Spring. 2 credits. Prerequisite: organic chemistry.
Intended to give an introduction to the technology of poultry, seafood, and other meats and to relate the underlying chemistry, biochemistry, and physiology of muscle to these technologies. Social, political, and economic factors will be discussed in terms of their effects on the technology.

321 Food Engineering I Fall. 3 credits. Prerequisite: Food Science 100.
Lecs. M W F 11:15, lab, M 1:25. S. H. Rizvi and staff.
Intended to give food science students an introduction to the engineering aspects of food plant operations and equipment. Deals with materials, power, fluid flow, heat transfer, steam, and refrigeration as used in food processing.

322 Food Processing I Spring. 4 credits. Prerequisite: Food Science 100 and 321 and Microbiology 290 and 291.
N. N. Potter, R. R. Zall.
Deals with the principles and practices of concentration, drying, freezing, and waste management applied to foods. Current processing methods and their relations to the chemistry, microbiology, and technology of raw materials and final products are discussed.

351 Milk Quality Spring. 1 credit. Prerequisite: Animal Science 250 or equivalent or permission of instructor.
Focuses on the important areas of farm sanitation and milk handling as they affect milk flavor and quality. Topics include an overview of quality control tests, basic microbiology, cleaning and sanitizing, and special problems in manufacturing and marketing fresh and storablable dairy products.

394 Food Microbiology Lectures Spring. 2 credits. Prerequisites: Microbiology 290 and 291.
The major families of microorganisms of importance in foods are studied systematically, with emphasis on the roles of these organisms in food preservation, food fermentations, and public health.

395 Food Microbiology Laboratory Spring. 2 credits. Graduate students must have permission of the instructor.
Work includes study of the physiological characteristics of representative food microorganisms, practice in using general and special methods for microbiological testing and control of food products, and practice in isolating and characterizing organisms of importance in foods.

401 Concepts of Product Development Spring. 2 credits. Prerequisite: Food Science 100 or equivalent. Offered alternate years. Not offered 1986-87.
A discussion of the sequence of events in developing and marketing new food products. Topics include
416 Food Packaging Laboratory

Spring. 2 credits.
Prerequisite: Food Science 415. Offered alternate years.

Lec, F, B; lab to be arranged. J. H. Hotchkiss.
A laboratory course designed to introduce several testing methods used in evaluating food packaging. Emphasis is on physical testing methods and the evaluation of total food packages. Students will design and build a new food package.

419 Food Chemistry Laboratory

Fall. 2 credits.
Prerequisites: Biological Sciences 330 or 331 and concurrent registration in Food Science 409.
Lab, T 12:00–4:25. D. Miller.
Intended to complement Food Science 409 in developing an understanding of the chemistry of food. Laboratory exercises deal with the chemical properties of foodstuffs and changes these components undergo in processing and storage. The relationship between the chemical composition of foods and functional, nutritional, and organoleptic properties is stressed.

421 Food Processing II

Fall. 3 credits.
Prerequisite: Food Science 322.
Principles and practices of thermal processing of foods, with emphasis on kinetics of destruction of microorganisms and quality factors, anxiety of food processing of fats and oils. Laboratory measurement of kinetic data, retort processing, lethality evaluation, and the chemical technology of fat processing.

422 Food Engineering II

Spring. 3 credits.
Prerequisite: Food Science 421.
Application of thermodynamic principles, mass transport, and related unit operations to food processes. Engineering aspects of food plant operations and automation, with emphasis on future directions. Laboratory includes theoretical computation and hands-on experiments.

496 Extension Methods in Food Science

Fall. 2 credits.
Prerequisites: Biological Sciences 330 or 331 and concurrent registration in Food Science 409.
Lab, T 12:00–4:25. D. K. Bandler.
A detailed study of milk constituents and their relationships to milk quality factors and chemistry and technology of milk processing and storage. The relationship between the chemical composition of foods and functional, nutritional, and organoleptic properties is stressed.

497 Special Topics in Food Science

Fall. 1 credit.
J. H. Hotchkiss.
Instructor. Offered alternate years.

601 Food Protein Chemistry

Fall. 3 credits.
Prerequisite: Food Science 409 or equivalent.
The chemistry and physical chemistry of proteins are discussed critically with respect to current methods of characterizing and processing proteins. Protein functionality is emphasized.

604 Chemistry of Dairy Products

Fall. 2 credits.
Limited to 16 students. Prerequisites: organic chemistry, biochemistry, knowledge of dairy-product manufacturing procedures, and permission of instructor. Offered alternate years.

A detailed study of milk constituents and their properties. Properties of various milk constituents are related to observed physical and chemical changes that occur in dairy products during and after processing. This course will emphasize current research in dairy chemistry.

605 Physical Chemistry of Food Components

Fall. 3 credits. Offered alternate years.
This course will cover the physical properties of food molecules. Emphasis will be placed on the molecular basis of structural characteristics, colloidal properties, molecular interactions, foams, gels, and water binding of foods.

606 Instrumental Methods

Fall. 5 credits.
Prerequisite: permission of instructor.
Lec, M W F 8, lab, M 1:25–3:20 and 4 hours per week to be arranged. J. W. Sherbon.
Deals with instrumental methods widely used in research and industry, including chromatography, spectrophotometry, electrophoresis, thermal analysis, and the use of computers. The stress is on the theoretical and practical aspects of the material presented. After the introduction, students will schedule laboratory time at their convenience.

607 Advanced Food Microbiology

Spring. 3 credits.
Prerequisites: food microbiology, genetics (preferred).
Lec, W 11:15; M. R. McLellan.
The theory and application of genetic engineering for improvement of microorganisms used in the food and other industries will be addressed. Additionally, new methods for detecting microorganisms and their products by DNA-DNA hybridization, monoclonal antibodies, etc. will be discussed.

608 Food Color and Food Pigments

Fall. 1 credit.
Prerequisite: organic chemistry. Offered alternate years.
A survey of color and chemical properties of the major intrinsic food pigments and their stability during processing and storage. Chemical and physical origins of color. Food color as an indicator of other food qualities. Color and pigments of selected commodities are examined.

609 Rheology

Fall. 1 credit. Offered alternate years.
Fundamental concepts of rheology applied to foods, with emphasis on objective methods for measuring textural properties. Principles and practice involved in measuring texture, viscosity, texture profiling, and consistency; instrumentation and correlations between objective and sensory methods of texture measurements. Examples of rheological problems in each major food group.

610 Introductory Chemical and Environmental Toxicology (also Toxicology 610)

Fall. 3 credits.
Prerequisites: biochemistry and animal physiology. Offered alternate years. Not offered 1986–87.
Introduction to the concepts and essentials of toxicology. The various biological responses to toxicants and the various pathways by which toxicants pass into the body. The toxicants, their toxicology, as well as the role of epidemiology, will be discussed. The chemical and biological factors that affect toxicity and specific sources of toxicants,
including air pollution, agriculture, industrial processes, foods, naturally occurring toxicants, and social poisons will be presented. Regulation of toxic materials will be introduced.

615 Secondary Plant Metabolites in Foods Fall. 1 credit. Prerequisite: Biological Sciences 330 or 331. Offered alternate years. Lec, F: 9:05. G. Hrazdina. Deals with the chemistry and biochemistry of secondary plant metabolites (chlorophyll, lignin, flavonoids, terpenoids, tannins, carotenoids, vitamin C, and cyanogenic glycosides) and their importance to food products. Emphasis is on the chemical and biochemical properties of these compounds, their occurrence in edible plants, their reactions, and influence on food products.

620 Food Carbohydrates (also Nutritional Sciences 620) Spring. 2 credits. Limited to qualified seniors and graduate students. Prerequisite: Biological Sciences 330 or equivalent. Offered alternate years. Lecs, T: 11:15. Staff. A consideration of the chemistry of carbohydrates, including sugars, starches, pectins, hemi-celluloses, gums, and other complex carbohydrates. Emphasis is on the intrinsic chemistry and functionality in food systems and the changes occurring during food processing and storage.


Related Courses in Other Departments

Marketing (Agricultural Economics 240)
Food Industry Management (Agricultural Economics 443)
Introduction to Agricultural Engineering and Computing (Agricultural Engineering 151)
Engineering Design and Analysis of Food Processing Equipment (Agricultural Engineering 466)

Meat and Meat Products (Animal Science 290)
Commercial Meat Processing (Animal Science 490)
Advanced General Microbiology Lectures (Microbiology 390)
Fundamentals of Postharvest Physiology: Handling and Storage of Horticultural Crops (Vegetable Crops 319)
Handling and Storage of Vegetables (Vegetable Crops 320)
Quality of Horticultural Crops during Marketing (Vegetable Crops 322)

International Agriculture

300 Perspectives In International Agriculture and Rural Development Fall. 2 credits. S-U grades optional. F: 1:25–3:20. R. W. Everett, M. J. Wright. A forum to discuss both contemporary and future world food issues and the need for an integrated, multidisciplinary team approach in helping farmers and rural development planners adjust to the ever-changing food needs of the world.

402 Agriculture in Tropical America Fall. 2 credits. Prerequisite: upperclass or graduate standing. Letter grades only. T: 2:30–3:20. M. H. Thurston and staff. A preparatory course for participation in International Agriculture 602. Physical resources, vegetation, history, crop and animal production, and various social and economic aspects of agriculture in tropical America will be discussed.

599 International Agriculture and Rural Development Project Paper Fall and spring. 1–6 credits. Limited to M.P.S. candidates in international agriculture and rural development. S-U grades only. Staff.

600 Seminar: International Agriculture Fall and spring. No credit. S-U grades only. Third and fourth W of each month, 4–5. Staff. The seminar focuses on developing an understanding of the nature and interrelatedness of agricultural development and the social sciences, plant and animal sciences, foods and nutrition, and natural resources.

602 Agriculture in the Developing Nations Spring. 3 credits. Prerequisites: International Agriculture 402 and permission of instructors. Cost of field-study trip includes return air fare and $350 for lodging, meals, and personal expenses. R: 2:30–4:25. W. R. Coffman and staff. Oriented to provide students an opportunity to observe agricultural development in a tropical environment and promote interdisciplinary exchange among staff and students. The two-week field-study trip during January to Latin American countries is followed by discussions and assignments dealing with problems in agriculture and livestock production in the context of social and economic conditions.

603 Administration of Agricultural and Rural Development (also Government 692 and Management MBA 588) Spring. 3 credits. S-U grades optional. T: 2:30–5:30. M. J. Esman, E. B. Oyer, N. T. Uphoff, L. W. Zuidema. An interdisciplinary course designed to provide graduate students with a multidisciplinary perspective on the administration of agricultural and rural development activities in developing countries. The course is oriented to students trained in agricultural and social sciences who are likely to occupy administrative roles during their professional careers.

604 Seminar on African Agriculture and Rural Development Fall. 2 credits. S-U grades optional. M: 1:25–3:20. F. W. Young. Strategies for increasing food production and raising rural incomes in Africa. Topics include cropping systems in Africa and the role of agricultural technology in increasing yields and improving livestock production; strategies for improving human nutrition; food storage and mechanization; rural employment projects; alternative rural development strategies; and experience with World Bank and other internationally funded rural development projects.

606 Farming Systems Research Fall. 3 credits. S-U grades optional. T: 2:30–4:25. R. Barker and staff. An interdisciplinary course focusing on the development of agricultural technologies and policies designed to assist small-scale farmers in developing countries. Techniques for gathering information, specifying research problems, and analyzing and interpreting data will be explored. The involvement of farmers in the research process is stressed.


650 Special Topics in International Agricultural and Rural Development Fall and spring. 1–3 credits. S-U grades optional. Staff. A seminar on current themes of agricultural and rural development. Specific content varies each semester.

703 Seminar for Special Projects in Agricultural and Rural Development Spring. 1 credit. Required for graduate students enrolled in the M.P.S. (Agri) degree program and majoring in international agricultural and rural development; others with permission of the program director. S-U grades only. M: 12:20. E. B. Oyer, L. W. Zuidema. The seminar provides students with the opportunity to present their special projects. It also serves as a forum for discussion of current issues in low-income agricultural and rural development, with particular attention to interdisciplinary complexities.

Related Courses in Other Departments

Political Economy of Ideology and Development in Africa (Africana Studies and Research Center 400)
Political Theory, Planning, and Development in Africa (Africana Studies and Research Center 500)
Economics of Agricultural Geography (Agricultural Economics 150)
Agricultural Trade Policy (Agricultural Economics 430)
Economics of Agricultural Development (Agricultural Economics 464)
Food, Population, and Employment (Agricultural Economics 660–661)

[Macroeconomic Issues in Agricultural Development (Agricultural Economics 663) Not offered 1986–87]

Microeconomic Issues in Agricultural Development (Agricultural Economics 664)


Seminar on Agricultural Trade Policy (Agricultural Economics 730)

Production of Tropical Crops (Agronomy 314)

Geography and Appraisal of Soils of the Tropics (Agronomy 471)


Livestock Production in Warm Climates (Animal Science 400)

Forages of the Tropics for Livestock Production (Animal Sciences 403)

Southeast Asia Seminar: Country Seminar (Asian Studies 601 and 602)

Ethnobotany (Biological Sciences 246)
Seminar in Science and Technology Policy in Developing Nations (City and Regional Planning 771)

Seminar in Policy Planning in Developing Nations: Technology Transfer and Adaptation (City and Regional Planning 772)

Seminar in Project Planning in Developing Countries (City and Regional Planning 773)

Intercultural and Development Communication (Communication Arts 612)

Communication in the Developing Nations (Communication Arts 624)

[Planning Educational Systems (Education 678) Not offered 1986–87]

Designing Extension and Continuing Education Programs (Education 681)

[Community Education (Education 682) Not offered 1986–87]

Behavioral Change in International Rural Modernization (Education 782)

Comparative Extension Education (Education 783)

Postharvest Food Systems (Food Science 247)

International Food Sciences and Development (Food Science 403) Not offered 1986–87

Political Economy of Change: Rural Development in the Third World (Government 648)

Regional Landscape Planning I (Landscape Architecture 531)

[Regional Landscape Planning II (Landscape Architecture 532) Not offered 1986–87]

International Environmental Issues (Natural Resources 400)

National and International Food Economics (Nutritional Sciences 457)

International Nutrition Problems, Policy, and Programs (Nutritional Sciences 680)

Seminar in International Nutrition and Development Policy (Nutritional Sciences 695)

Special Topics in International Nutrition (Nutritional Sciences 699)

Plant Diseases in Tropical Agriculture (Plant Pathology 655)

Economic Fruits of the World (Pomology 208)

Rural Sociology and Agrarian Problems (Rural Sociology 205)

Social Indicators and Data Management (Rural Sociology 213)

[Social Stratification (Rural Sociology 445) Not offered 1986–87]

Contemporary Sociological Theories of Development (Rural Sociology 606)

Gender Relations and Social Transformation (Rural Sociology 625)

[Social Organization of Agriculture (Rural Sociology 560) Not offered 1986–87]

The Politics of Policy, Planning and Evaluation (Rural Sociology 575)

Design and Data Analysis in Development Research (Rural Sociology 715)

[Social Movements in Agrarian Society (Rural Sociology 723) Not offered 1986–87]

Sociotechnical Aspects of Irrigation (Rural Sociology 754, Agricultural Economics 754, and Agricultural Engineering 754)

Landscape Architecture

The Landscape Architecture Program at Cornell is sponsored by the College of Agriculture and Life Sciences through the Department of Forestry and Ornamental Horticulture and the College of Architecture, Art, and Planning. For course descriptions, see the listings under the Department of Forestry and Ornamental Horticulture.

Microbiology

R. P. Mortlock, chairman; W. C. Ghirose, E. P. Greenberg, C. M. Rehkugler, V. J. Stewart; P. J. VanDemark, S. H. Zinder

290 General Microbiology Lectures Fall, spring, or summer. 3 credits. Prerequisites: Biological Sciences 101–102 and 103–104 and Chemistry 104 or 208. Recommended: concurrent registration in Microbiology 291.

M W F 9:05 (spring only) or 11:15. Three evening exams in spring. Fall, W. C. Ghirose; spring, P. J. VanDemark; summer, staff.

A study of the basic principles and relationships in the field of microbiology, with fundamentals necessary for further work in the subject.

291 General Microbiology Laboratory Fall or spring, 2 credits. Summer, 3 credits. Prerequisite: Microbiology 290 (may be taken concurrently).

T R 10:30–11:45, or 2–4:25. Fall, W. C. Ghirose; spring, P. J. VanDemark.

A study of the basic principles and techniques of laboratory practice in microbiology, and fundamentals necessary for further work in the subject.

292 General Microbiology Discussion Spring, 1 credit. Prerequisite: Microbiology 290 (may be taken concurrently). S-U grades only.

Hours to be arranged. P. J. VanDemark.

A series of discussion groups in specialized areas of microbiology to complement Microbiology 290.

314 Tissue Culture Techniques and Applications Fall. 2 credits. Prerequisites: Microbiology 290 and 291 or permission of instructor.


A series of lectures and demonstrations dealing with cell culture methods, especially those required to culture cells of animals from different tissue origins. The application of cell culture to the study of bacterial diseases, virus replication, and the production of biologics is considered.

[336 Applied and Industrial Microbiology Fall, 3 credits. Prerequisites: Microbiology 290 and organic chemistry. Not offered 1986–87.


A survey of the microbiology of industrial fermentations and public health aspects of water and wastewater.]

390 Advanced General Microbiology Lectures Fall, 2 credits. Prerequisites: Microbiology 290 and 291 and organic chemistry. May be taken independently of Microbiology 391.


A consideration of the physiology, ecology, genetics, and practical potential of important groups of bacteria. Topics include modern methods for determining bacterial phylogeny and taxonomy, and the evolution in bacteria of diverse mechanisms of energy conservation, fixation of carbon and nitrogen, and adaptation to extreme environments.

391 Advanced General Microbiology Laboratory Fall. 2 credits. Prerequisites: Microbiology 390 (may be taken concurrently) and permission of instructor.


Intended as a laboratory complementing Microbiology 390. The enrichment, isolation, characterization, and study of bacteria included in Microbiology 390.

412–413 Clinical Microbiology 412, fall; 413, spring. Credit to be arranged. Prerequisite: permission of instructor.

Hours to be arranged. R. P. Mortlock, P. J. VanDemark.

Training and practical experience in clinical microbiology in the hospital laboratory of the Cornell Medical College and New York Hospital in New York City. Emphasis will be upon developing the student's capability in the isolation and rapid identification of organisms from various types of clinical specimens. This course is intended to prepare the student for state and federal licensing in various areas of clinical microbiology.


A consideration of the relation of microorganisms, especially the bacteria, to aquatic environments, both natural and artificial. The microbiology of wastewaters is included. Attention is given to fundamental biological concepts and to applied aspects of the occurrence and activities of microorganisms in water.]

480 Microbial Physiology Lectures Spring, 3 credits. Prerequisites: Microbiology 290 and 291 and biochemistry. S-U grades optional for students not specializing in microbiology.


The concern is with the physiological functions of microorganisms. Consideration is given to chemical structure, regulation, growth, and the energy metabolism of prokaryotic organisms. Special attention given to those aspects of microbial metabolism and carbohydrate catabolism not normally studied closely in biochemistry courses.

481 Microbial Physiology Laboratory Spring, 3 credits. Limited to 12 students. Prerequisites: Microbiology 480 (may be taken concurrently) and permission of instructor. S-U grades optional.


The laboratory component of Microbiology 480. Deals with laboratory experiments and techniques used in studying the physiological characteristics of microorganisms.


Morphology and ultrastructure of prokaryotic cells are considered with regard to the chemical composition and physiological function of subcellular components.]

[485 Prokaryotic Cytology Laboratory Spring, 2 credits. Enrollment limited. Prerequisite: Microbiology 484 or concurrent enrollment, and permission of instructor. Offered alternate years. Not offered 1986–87. Hours to be arranged. W. C. Ghirose.

Cytological and cytocytochemical techniques, including preparations for light and electron microscopy, that are applicable to the study of prokaryotic cells.]
791 Graduate Seminar in Microbiology Fall and spring. 1 credit. Required of all graduate students in the graduate field of microbiology; a seminar relating to the research activities of those enrolled. Students who have completed the Microbiology 791 series requirement are required to present a seminar concerning their research interests and activities at least once each year. S-U grades only. Hours to be arranged. Staff.

Related Courses in Other Departments

Soil Microbiology (Agronomy 476)
Advanced Soil Microbiology (Agronomy 666)

Microbial Genetics, Lectures (Biological Sciences 485)
Microbial Genetics, Laboratory (Biological Sciences 486)

Microbial Engineering (Chemical Engineering 644)
Insect Pathology (Entomology 453)

Food Microbiology Lectures (Food Science 394)
Food Microbiology Laboratory (Food Science 395)

Food Mycology (Food Science 411)
Advanced Food Microbiology Lectures (Food Science 607)

Basic Immunology, Lectures (Veterinary Medicine 315 and Biological Sciences 305)
Basic Immunology, Laboratory (Veterinary Medicine 316 and Biological Sciences 307)

Pathogenic Microbiology (Veterinary Medicine 317)

Advanced Immunology, Lectures (Veterinary Medicine 705)
Advanced Immunology, Laboratory (Veterinary Medicine 706)

Advanced Work in Bacteriology, Virology, or Immunology (Veterinary Medicine 707)

Advanced Animal Virology, Lectures (Veterinary Medicine 708)
Advanced Animal Virology, Laboratory (Veterinary Medicine 709)

Immunopathology and Clinical Immunology (Veterinary Medicine 712)

Natural Resources


120 Agriculture and Wildlife Spring. 3 credits.
Lecs, M W F 11:15. A. N. Moen.
A survey course for students in any year or major. Interactions between agriculture and wildlife in North America since 1800. Emphasis on agricultural impacts on wildlife, wildlife impacts on agricultural productivity and wildlife damage control, and policies and programs of agencies and other organizations that influence wildlife on agricultural lands.

200 Principles of Conservation Fall. 3 credits. Limited to students specializing in natural resources. Not open to students who have passed Natural Resources 201.
Lecs, M W F 10:10; 1-hour disc to be arranged. R. T. Oglesby.

The nature of natural resources, how they are managed, and their interactions with individuals and societies are considered. Case histories and demonstrations will be used to illustrate both principles and practices. Emphasis will be on management of renewable resources based on an ecological perspective.

201 Environmental Conservation Spring. 3 credits. Not open to students who have passed Natural Resources 200.
Lecs, M W F 10:10; 1-hour disc to be arranged. T. J. Fahey.
A survey course intended for students in any year or major. Designed to provide experience in implementation of conservation ideas as an aid to understanding the major environmental problems facing spaceship Earth. A topical approach with representative case histories is taken. Topics include global changes—CO₂, ozone, and climate; population growth and the world food problem; energy resources and alternatives; mineral resources and recycling; land use in urban and rural landscapes; air, water, and soil pollution; and endangered species and wildlands.

210 Introductory Field Biology Fall. 4 credits. Limited to 45 students. Open to sophomores and juniors with an adviser in Natural Resources or by permission of instructor. Prerequisites: Biological Sciences 101 and 102 or equivalent. Cost of field trips, no more than $10.
Lecs, W 8:55, labs, M W 1:25–4:25. 2 overnight field trips required. T. A. Gavin.
Introduction to methods of inventorying and identifying plants and animals. Approximately 150 species of vertebrates and 75 species of woody plants found in New York State are covered. Selected aspects of current ecological thinking, relevant to problems in assessment of the distribution and abundance of organisms, are stressed. The interaction of students with biological events in the field and accurate recording of these events are emphasized.

250 Introduction to Wildlife Science Spring, first third of term. 1 credit.
Lecs, M W F B. H. Brumsted.
Introduction to the biological characteristics of wildlife species, with analyses of these characteristics in relation to ecology and management.

251 Introductory Fishery Biology Spring, weeks 6–10. 1 credit.
Lecs, M W F D. A. Webster.
Life history and ecology of salmonids is presented as an example of information needed in conservation and management efforts for sport and commercial fisheries. Management perspectives are developed from the standpoint of vital statistics of fish stocks and the preservation of fish habitat. Guest lectures are offered on the latter subject.

252 Introductory Forestry Spring, last third of term. 1 credit. Prerequisites: Natural Resources 210 or permission of instructor.
Lecs, M W F B. Field trip, all day on one S. J. P. Lassoe.
Appreciation of forests as a natural resource. Importance of ecology and measurement as bases for forest management. Introduction to tree biology and silviculture.

302 Forest Ecology Fall. 4 credits. Cost of trip, no more than $20.
Lecs, M W F 11:15. lab, M 12:20–4:25. 1 weekend trip S through M. T. J. Fahey.
Analysis of the distribution, structure, and dynamics of forest ecosystems. All laboratory sessions in the field. One weekend field trip to the Adirondacks or other forest region.

305 Maple Syrup Production Spring. 2 credits. Limited to 20 students. Prerequisite: permission of instructor. Letter grades only.
T 1:25–4:25. (preliminary seminars, followed by several half-days of fieldwork during the maple season). J. Kelley.
400 International Environmental Issues  Fall. 3 credits. Limited to 30 students. Prerequisite: junior standing or above. 
International aspects of environmental and natural resource preservation and development. Concepts: e.g., development, resource ownership, exploitation, compensation, and preservation. Cultural differences in attitudes and behavior towards environment. Management practices under different cultural, economic, and social contexts. Current issues: e.g., acid precipitation; management of migratory whales; energy issues; and preservation of fragile and sensitive ecosystems. Lecture and discussion, term paper, and examinations.

406 Conducting Marine and Natural Resources Extension Programs  Spring. 3 credits. Offered alternate years.
Extension programs stimulate and help citizens to use current research knowledge to reach decisions on the management of natural resources. This course provides an overview of the constructs used in this emerging natural resource field, as well as gives exercises in components important in conducting such efforts.

407 Religion, Ethics, and the Environment  Spring. 3 credits. For juniors, seniors, and graduate students; others by permission. S-U grades optional.
T R 9:05, 1-hour disc to be arranged. R. A. Baer.
A study of how the humanities, especially religion, philosophy, and ethics, affect our understanding and treatment of nature. Historical overview followed by consideration of selected themes, including the structure of modern science, the meaning of the term nature, play and work, human finitude and death, and the nature of ethics as a discipline. Also responsibility to future generations; limiting growth and questions of distributive justice; world population and global hunger; nuclear holocaust and the environment; implications of environmental programs for minorities, the poor, and other nations; the meaning of the term public interest; land use (including the preservation of farmland); and energy policy.

410 Principles of Wildlife Management  Spring. 3 credits. Prerequisite: introductory biology.
M W F 9:05. A. N. Moen.
In-depth analysis of the ecological basis for decision making in wildlife management, with further considerations of sociological, economic, and legal factors. Computers are used for problem solving.

414 Selected Topics in Wildlife Resource Policy  Spring. 2 credits. Intended for juniors and seniors. Prerequisite: Natural Resources 410 or equivalent or permission of instructor. S-U grades optional. Cost of field trips, no more than $25.
T 1:25–4:25. Several field trips usually taken weekly; one overnight field trip to Albany. H. B. Brumsted.
A seminar devoted to analysis of selected current policy issues in wildlife management. Particular attention is given to citizen roles in policy development.

417 Wetland Resources  Summer, 1 week at Shoals. 1 credit. Not offered 1986–87.
R. A. Malecki. 
For description, see listing under 'Courses in Marine Sciences.' In the section on the Division of Biological Sciences.]

430 Dynamics of Animal Populations  Spring. 2 credits. For sophomores and graduate students in natural resources; others by permission of instructor. Offered alternate years. Not offered 1986–87.
A quantitative examination of the dynamics of animal populations. Interactive computing is used to assist in analysis and understanding of mortality, growth, population estimation, and population interaction.

438 Fishery Resource Management  Spring. 3 credits. Prerequisite: Natural Resources 440 or permission of instructor.
Lecs, T R 8 plus discS. C. C. Krueger.
Introduction to the tactics of fisheries management that may be used to achieve specific objectives and goals. Coverage includes sport and commercial fisheries as well as endangered species management. Topics include goal and objective setting; decision making; regulations; habitat management; population concepts; stocking; and trout, reservoir, Great Lakes, and Pacific halibut management.

440 Fishery Science  Fall. 3 credits. For seniors majoring in fishery science; others by permission of instructor. Prerequisites: a year of statistics and calculus. Offered alternate years. Not offered 1986–87.
Principles and theories involved in dynamics of fish stocks. Methods of obtaining and evaluating statistics of growth, population size, mortality, yield, and production are considered.

442 Techniques in Fishery Science  Fall. 3 credits. Limited to 15 upperclass and graduate fishery students. Offered alternate years. Cost of field trips, no more than $30.
T R 1:25–4:25, 1 or more weekend field trips. C. C. Krueger.
Emphasis is on methods of collecting data on attributes of fish populations and their habitat. Topics include passive and active fish-capture methods, tagging and marking, age and growth determination, food-habit studies, and physical and chemical habitat measurements. Several field trips provide hands-on experience in data collection on streams and lakes.

493 Research in Resource Analysis and Planning  Fall or spring. Credit to be arranged. Prerequisite: permission of instructor. S-U grades optional.

494 Research in Fishery Science  Fall or spring. Credit to be arranged. S-U grades optional. 
Lecs, T R 9:05; lab, W 1:25-4:25; several field trips. S. P. Gloss.
A seminar discussing the law and issues concerning current marine policy questions, as well as the expected to participate.

495 Research in Wildlife Science  Fall or spring. Credit to be arranged. Prerequisite: permission of instructor. S-U grades optional.

496 Research in Forestry  Fall or spring. Credit to be arranged. S-U grades; letter grade by permission of instructor.
Lecs, T R 9:05; lab, W 1:25-4:25; several field trips. S. P. Gloss.
A seminar discussing the law and issues concerning current marine policy questions, as well as the expected to participate.

500 Professional Projects—M.P.S.  Fall and spring. Credit to be arranged. Limited to graduate students working on professional master's projects. S-U grades only.
Staff.

601 Seminar on Selected Topics in Fishery Biology  Fall or spring. 1 credit. S-U grades optional. Hours to be arranged. Staff.

602 Seminar in Natural Resources Analysis for Ecologically Based Planning  Spring. 2 credits. S-U grades only.
M 2:30. Staff.
A multipurpose graduate seminar. Theme changes each year but usually involves a case study of a specific area of land and water. Fieldwork usually required. Engineers, economists, sociologists, soil scientists, foresters, planners, and wildlife and fishery biologists are invited to bring expertise to the planning table.

603 Habitat Ecology  Spring. 2 or 3 credits. Limited to 12 seniors and graduate students majoring in natural resources or biological sciences. Prerequisite: permission of instructor. Cost of field trips, no more than $25.
This course requires an understanding of broad ecological concepts relative to plant-wildlife interactions; the concepts of niche, habitat, and community as advanced from the standpoint of island biogeographic principles, structural and spatial heterogeneity of the vegetation, community productivity, and temporal change. Major landforms and plant-animal communities of the northeastern United States will be discussed and visited during weekend field trips as scheduling permits. Paper required for 3-credit option.

604 Seminar on Selected Topics in Resource Policy and Planning  Fall. 1 credit. S-U grades only.
Hours to be arranged. Staff.
Primarily for graduate students specializing in natural resources conservation.

606 Marine Resources Policies  Spring. 2 credits. Prerequisite: at least one related course such as Biological Sciences 364, 666, or 668; or Natural Resources 438; or permission of instructor. S-U grades optional.
A seminar discussing the law and issues concerning current marine policy questions, as well as the expected to participate.

607 Ecotoxicology  Spring. 3 credits. Prerequisites: graduate or senior status and two 300-level courses (or higher) in chemistry, biochemistry, or toxicology. Not offered 1986–87.
Lecs, M W F 11:15. J. W. Gillett.
Lectures, readings, and special guest lectures on toxic effects. Topics include factors that control the uptake of toxicants by organisms, fate of toxicants in the environment, toxic effects in different species, and applications to environmental problems.

609 Effects of Ecological Perturbations on Fishes  Spring. 3 credits. Prerequisite: Biological Sciences 476 or permission of instructor. Cost of field trips, no more than $15.
Lecs, T R 9:05; lab, W 1:25–4:25; several field trips. S. P. Gloss.
Impacts of habitat alteration and physicochemical pollutants, with emphasis on freshwater and diadromous fish species of North America. Direct and indirect effects of a variety of industrial and land-use practices on fish and other aquatic organisms, with resultant changes in structure and function of fish communities due to lethal and sublethal responses are discussed. Laboratory includes several field trips.

610 Conservation Seminar  Fall and spring. No credit. All graduate students in natural resources are expected to participate.
Hours to be arranged. Staff.

611 Seminar in Environmental Values  Fall. 3 credits. For graduate students, juniors, and seniors.
M 2:30. Staff.
A seminar for students majoring in environmental studies. Current issues include the role of nature, value systems, and ethics, contribute to our understanding of
agriculture and the environment. In successive years the seminar will focus on topics such as (1) land-use ethics, (2) the ethics of farmland preservation, (3) dealing with values and formulating resource policy via pluralistic and democratic society, and (4) national resource management and the concept of public interest.


700 Ecotoxicologic Methods Fall. 4 credits. Prerequisites: Natural Resources 607 or permission of instructor.

401 Plant Cell and Tissue Culture Spring. 2 credits. Prerequisite: a course in plant physiology, cell biology, or genetics, or permission of instructor.

402 Plant Tissue Culture Laboratory Spring. 1 credit. Enrollment limited. Prerequisite: Plant Breeding 401 (may be taken concurrently) and written permission of instructor.

603 Methods of Plant Breeding Fall. 3 credits. Prerequisites: Biological Sciences 101–102; Biological Sciences 281 or Plant Breeding 225 or equivalent; and field crops, vegetable crops, forage, or pomology. M W F 11:15, W. R. Cofman.

604 Methods of Plant Breeding Laboratory Fall. 2 credits. Prerequisites: Plant Breeding 603 or equivalent.

605 Physiological Genetics of Crop Plants Spring. 1 credit. Prerequisites: either genetics, biochemistry, and plant physiology, or permission of instructor. Offered alternate years.

622 Seminar Fall or spring. 1 credit. S-U grades only.


690 Plant Breeding

Plant Pathology


301 Introductory Plant Pathology Fall. 4 credits. Prerequisites: Biological Sciences 101–102 and 103–104, or 105–106. Recommended: Biological Sciences 241 or equivalent.

309 Introductory Mycology Fall. 4 credits. Prerequisites: a year of biology or equivalent and permission of instructor.

402 Plant Disease Control Spring. 3 credits. Prerequisite: Plant Pathology 301 or equivalent.

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This course complements Plant Pathology 301 with an in-depth presentation of the principles and practices of plant disease control, building on the students' knowledge of diseases and their causal agents. General principles and concepts, illustrated by specific examples, are presented. Students write a term paper applying these principles to a specific disease-control problem. The laboratories provide practical experience in diagnosis and disease-control techniques.

443 Pathology and Entomology of Trees and Shrubs (also Entomology 443) Fall. 5 credits. Prerequisites: Plant Pathology 301 and Entomology 241 or equivalents. Lectures, M W F 10-10; labs, T R 1:25–4:25 or W F 1:25–4:25. Evening prelins. W. T. Johnson, G. W. Hudler. For students preparing for careers in horticulture, urban forestry, and pest management. Deals with the nature, diagnosis, assessment, and treatment of diseases and arthropod pests of trees and shrubs. Forest, shade, and ornamental plants are considered.

444 Integrated Pest Management (also Entomology 444) Fall. 4 credits. Prerequisites: Biological Sciences 261, Entomology 212 or 241, and Plant Pathology 301 or their equivalents or permission of instructor. Lectures, M W F 9:05; lab, M or W 1:25–4:25. P. A. Arneson. Lectures integrate the principles of pest control, ecology, and economics in the management of pest-crop systems. Laboratories consist of exercises to reinforce concepts presented in lecture and demonstrate pest monitoring techniques and the application of computer technology to management problems.

497 Special Topics Fall or spring. 1–5 credits. S-U grades optional. Hours to be arranged. Staff. An opportunity for independent study of a special topic in mycology or plant pathology under the direction of a faculty member.

498 Teaching Experience Fall or spring. 1–5 credits. S-U grades optional. Hours to be arranged. Staff. Undergraduate teaching assistance in a mycology or plant pathology course by mutual agreement with the instructor.

499 Undergraduate Research Fall or spring. 3–5 credits. S-U grades optional. Hours to be arranged. Staff. An opportunity for research experience under the direction of a faculty member.

641–655 Special Topics Series Unless otherwise indicated, the following description applies to courses 641–655.

Fall or spring. 1 credit. Prerequisites: permission of instructor. S-U grades only. Hours to be arranged.

641 Cytology of Plant Diseases J. R. Aist, H. W. Israel.

642 Plant Disease Epidemiology P. A. Armeson, W. E. Fry

644 Soil-Borne Pathogens G. S. Abawi.

645 Plant Virology M. Zaitlin, W. F. Flochoy.


647 Bacterial Plant Diseases S. V. Beer.

648 Pathogen and Disease Physiology H. D. VanEtten.

649 Mycology Conferences Fall. 2 credits. Lec and lab. R. P. Korf. Basidiomycetes, except rusts.


651 Diseases of Fruit-Tree Crops For graduate students and advanced undergraduates with a particular interest in fruit. Autotutorial slide and tape sets. P. A. Armeson. Covers the economic importance, causal agents, symptoms, disease cycle, and control measures for the major diseases of tree fruit in the Northeast.

652 Field Crop Pathology G. C. Bergstrom.

653 Dendropathology Spring. G. W. Hudler, W. A. Sinclair.

654 Diseases of Florist Crops R. K. Horst.

655 Plant Diseases in Tropical Agriculture Spring. H. D. Thurston.

659 Plant Pathology Seminar Fall and spring. 1 credit. Required of all plant pathology majors. S-U grades only. T 4:30–5:30. Staff.

701 Concepts of Plant Pathology: Organisinal Aspects Spring. 3 credits. For graduate students with majors or minors in plant pathology; others by permission. Prerequisite: Plant Pathology 301 or equivalent and permission of instructor. Lectures, T R 9; lab-disc, R 2:25–4:25. S. V. Beer, O. C. Yoder. Concepts in host-pathogen relationships with emphasis on roles of molecules and cells in determining the outcome of an interaction. Genetic, molecular biological, physiological, and cell biological approaches to experimental analysis will be considered. Historical perspectives and recent research will be reviewed and analyzed. Students prepare and review mock grant proposals.

702 Concepts of Plant Pathology: Population Aspects Spring. 3 credits. For graduate students with a major or minor in plant pathology; others by permission. Prerequisite: Plant Pathology 301 and permission of instructor. Lect, T R 8; lab, T 2:25–4:25. Ecology of soilborne and airborne pathogens, epidemiology, disease assessment, crop losses to plant disease, disease control and pest management, and sociological aspects of plant pathology. The laboratory period will be used in part for exercises that illustrate concepts and in part for discussions.

705 Phytovirology Spring. 2 credits. For graduate students with a major or minor in plant pathology; others by permission. Prerequisite: Plant Pathology 301 or equivalent. Lect, T R 10:10. M. Zaitlin. This course considers plant viruses and the diseases they cause. Consideration is given to virus structure and composition, classification, replication, effects on hosts, modes of transmission, and the relationships of these aspects to principles of diagnosis and control.

706 Phytonematology Fall. 2 credits. For graduate students with a major or minor in plant pathology; others by permission. Prerequisite: Plant Pathology 301 or equivalent or permission of instructor. Lect, R 11:15; lab, R 1:25–4:25. Staff. Deals with morphology, anatomy, biology, classification, ecology, detection and identification of plant pathogenic nematodes, evaluation of population data, interactions between nematodes and other plant pathogens, and methods of assessment of pathogenicity and plant damage.

707 Phytopathology Fall. 2 credits. For graduate students with a major or minor in plant pathology; others by permission. Prerequisite: Plant Pathology 301 or equivalent or permission of instructor. Not offered 1986–87.

708 Mycology Spring. 2 credits. For graduate students with a major or minor in mycology or plant pathology; others by permission. Prerequisite: Plant Pathology 301 or 309 or equivalents, and permission of instructor. Lect, F 1:25–2:30; lab, 2:30–3:40. J. W. Lorbeer. Provides basic information on the biology of plant pathogenic fungi with selected emphasis on the structure, ecology, genetics, life cycles, and disease cycles of representative genera and species.

735 Advanced Plant Pathology Fall. 3 credits. For graduate students with a major or minor in mycology or plant pathology; others by permission. Prerequisite: Plant Pathology 301 and 309 or equivalents, and permission of instructor. Lect, F 1:25–2:30; lab, 2:30–3:40. J. W. Lorbeer. Provides basic information on the biology of plant pathogenic fungi with selected emphasis on the structure, ecology, genetics, life cycles, and disease cycles of representative genera and species.

738 Molecular Mechanisms of Pathogenesis Fall. 2 credits. For graduate students with a special interest in molecular mechanisms of pathogenesis. Prerequisite: permission of instructor. S-U grades only. Offered alternate years. Hours to be arranged. H. D. VanEtten, O. C. Yoder, and staff. This course deals with the molecular properties of both microorganisms and higher plants that control the development of host-parasite relationships. Contemporary molecular hypotheses are related to genetic mechanisms of pathogenesis. Emphasis is placed on a critical evaluation of the data that are used to support each specific hypothesis.

739 Advanced Mycology Fall. 4 credits. Prerequisites: Plant Pathology 309 or equivalent, a course in genetics, and permission of instructor. Offered alternate years. Lect, M 10:10; labs, M W 1:25–4:25, plus an additional 3-hour period to be arranged. Optional field trips. R. P. Korf. A detailed study of the taxonomy, nomenclature, and biology of two major groups of fungi (rusts and fungi imperfecti).
797 Special Topics Fall or spring. 1-5 credits. S-U grades optional. Hours to be arranged. Staff. An opportunity for independent study of a special topic.

799 Graduate Research Fall or spring. 1-5 credits. S-U grades optional. Hours to be arranged. Staff.

Pomology


100 Introductory Pomology Fall or spring. 3 credits. S-U grades only for graduate students. Lect., T R 8; labs (fall), T or W 2-4:25; (spring) T or R 2-4:25. One half-day field trip required. G. H. Obery. A study of the general principles and practices of fruit culture and its relation to the underlying sciences. Included are tree fruits, grapes, and small fruits. Topics covered include propagation, varieties, crop management, and growth and fruiting habits. Practical work is presented in grafting, pruning, sites and soil selection, and planting.

208 Economic Fruits of the World Spring. 3 credits. Prerequisite: introductory biology or permission of instructor. Offered alternate years. Not offered 1986-87. Lecs, M W 10:10; lab, F 1:25-3:55. F. W. Liu. The more important subtropical and tropical fruits such as citrus, banana, pineapple, mango, coffee, and cacao are considered. Morphology, physiology, and adaptation to climate are stressed rather than details of culture. A broad view of world pomology is given.

302 Fruit-Tree Nursery Operation Spring, first 4 weeks. 1 credit. Prerequisite: Pomology 100 or permission of instructor. Offered alternate years. Not offered 1986-87. Lecs, M W 9:05; lab, W 2-4:25. Staff. This course is intended to familiarize the fruit producer with the operations and problems of the fruit-tree nursery phase of fruit culture. Emphasis is placed on nursery management, cultural practices, and production of nursery stock.

304 Orchard Management I Spring. 3 credits. Prerequisite: Pomology 100. Lecs, M W 8; lab, M 1:25-4:25. L. E. Powell, W. C. Stiles. A treatment of problems of concern to fruit growers, such as site selection, planting and pruning systems, water relations, cold hardiness, dormancy, flowering, and fruiting. Physiological and practical aspects are emphasized.

305 Orchard Management II Fall. 3 credits. Prerequisite: Pomology 100. Recommended: Pomology 304. Lecs, M W 8; lab, M 1:25-4:25. G. H. Obery, L. L. Creasy. A continuation of the principles of pomology presented in Pomology 304. Subjects include the later stages of fruit maturation, quality, harvesting, aspects of tree nutrition, protection from pests, and regulatory policies affecting fruit production and sale.

306 Small Fruits Spring, last 9 weeks. 2 credits. Prerequisite: Pomology 100 or permission of instructor. Offered alternate years. Not offered 1986-87. Lecs, M W 9:05; lab, W 2-4:25. M. P. Pritts. A study of the evolution, breeding history, and biology of strawberries, raspberries, blueberries, and bushesberries and of cultural practices used to maximize production. Emphasis will be placed on understanding how cultural practices influence growth, development, and fruiting and protect these species from diseases and insects.

307 Viticulture Fall. 3 credits. Prerequisite: Pomology 100 or permission of instructor. Offered alternate years. Not offered 1986-87. Lecs, T R 9:05; lab, R 2-4:25. Saturday field trips in early fall will replace several laboratory meetings. R. M. Pool. Viticulture, with emphasis on the viticulture of the Great Lakes region, is presented as a series of interrelated decisions on varieties, sites, vine management, and vine protection. Those decisions are based on viticulture-wine making, meteorology, soils, vine and grape anatomy and physiology, as well as protection of the vine and grapes from injuries, primarily from diseases and insects.

311 Fruit Crop Systematics Fall, first 4½ weeks. 1 credit. Prerequisite: Pomology 100 or permission of instructor. S-U grades optional. Offered alternate years. Lecs, T R 9:05; lab, R 2-4:25. G. H. Obery. The classification of fruit species is considered from a botanical and production viewpoint. The course deals with the identification and naming of fruit species and varieties and their botanical classification.

313 Utilization of Fruit Crops Fall, middle 4½ weeks. 1 credit. Prerequisite: Pomology 100 or permission of instructor. S-U grades optional. Offered alternate years. Lecs, T R 9:05; lab, 1:25-3:55; two field trips, R 12:30-5:30, F. W. Liu. A consideration of the fate of fruits produced for processing. The coverage of fruit products is generally limited to those commercially grown and processed in New York State. Although the discussion includes methods of canning, freezing, dehydration, and other types of processing, emphasis is on the quality requirement and proper handling of raw materials and how they affect the quality of end products.

315 Fruit Quality Improvement Fall, last 4½ weeks. 1 credit. Prerequisite: Pomology 100 or permission of instructor. S-U grades optional. Offered alternate years. Lecs, T R 9:05; lab, R 2-4:25. Staff. The techniques and limitations of producing new varieties of perennial fruit crops are considered.

319 Fundamentals of Postharvest Physiology; Handling, and Storage of Horticultural Crops (also Agricultural Engineering 319 and Vegetable Crops 319) Fall. 3 credits. Prerequisite: one horticultural course or permission of instructor. Lecs, M W 9:05; lab, F 1:25-3:55. F. W. Liu, J. R. Hicks, J. A. Barkley. The physiology—transpiration, respiration, ethylene synthesis and action, maturation, ripening, and senescence—of fruits, vegetables, flowers, and ornamental crops is considered. Factors influencing the physiological process, thus affecting the quality and marketability of the products, are considered. The principles and methods of harvesting, cleaning, grading, packaging, precooling, waxing, sanitation, and transportation of the products are studied. Storage methods, including common storage, refrigerated storage, controlled-atmosphere storage, and hypobaric storage, are discussed.

320 Commercial Harvesting, Handling, and Storage of Fruits Spring, first 3½ weeks. 1 credit. Prerequisite: Pomology 100 or permission of instructor. Lecs, M W 9:05; lab, T 1:25-3:55. G. D. Blanpied. Orchard factors influencing harvest maturity, quality and storability of apples and methods of commercial harvest, handling, and storage for other important temperate climate fruits are studied.

400 Undergraduate Seminar Spring. 1 credit (may be taken twice for credit). Prerequisite: a course in pomology. S-U grades only. Hours to be arranged. Staff. Seminar topics and speakers selected and arranged by the students on subject areas related to pomology.

402 Special Topics in Experimental Pomology Spring. 3 credits. Open to undergraduates by permission. Offered alternate years. Hours to be arranged. Staff. Selected topics are considered with respect to the current literature or experimental techniques. Topics reflect the research interests of the professors who participate.

404 Effective Horticultural Research Spring. 2 credits. Undergraduates admitted by permission of instructor. S-U grades optional. Offered alternate years. Not offered 1986-87. Hours to be arranged. A. N. Lakso. Methods of problem solving in research will be examined with emphasis on horticultural problems. Invited faculty and administrators will lead discussions on selected topics. Each student will be required to prepare a term paper and make an oral presentation on a grant proposal related to horticulture.

603 Current Topics in Postharvest Horticulture Fall or spring. 1 credit. Prerequisite: permission of instructor. Hours to be arranged. G. D. Blanpied. Graduate students and staff report and discuss current topics in postharvest biology and technology of horticultural crops.


610 Research Fall or spring, 2 or more credits. Prerequisite: a course in advanced pomology. S-U grades optional. Undergraduates must attach to their course enrollment material written permission from the staff member who will supervise the work and assign the grade. Staff.

700 Graduate Seminar Fall. 1 credit. S-U grades only. Hours to be arranged. Staff. Reports by students on current research or literature in experimental pomology or related areas.

710 Teaching Experience Fall or spring, 1 credit. S-U grades only. Prerequisite: permission of instructor. Hours to be arranged. J. R. Hicks. Designed to acquaint pomology graduate students with the methods and materials involved in teaching. The student participates in the design, delivery, and evaluation of segments of a departmental course.

Related Courses in Another Department

General Horticulture (Vegetable Crops 103)

Handling and Marketing of Horticultural Crops (Vegetable Crops 322)

Advanced Postharvest Physiology (Vegetable Crops 612)

Poultry and Avian Sciences

The faculty members in the Department of Poultry and Avian Science are responsible for courses taught in several areas, including animal sciences, biological sciences, food science, and nutritional sciences. See the particular sections on those subjects for courses.

**Rural Sociology**


**Introduction to Sociology: Social Structure and Quality of Life** Fall. 3 credits. Lecs. TR 10:10; disc and lab, 1 hour to be arranged.

P. R. Eberts and staff.

Topics course examines how social factors influence people’s well-being. We will examine well-being as observed in individuals, communities, and societies. The social factors examined as causes of variation in well-being include, social identity, family and marital conditions, educational background, race and religion, occupation and the world of work, political participation and power structures, organizations and affiliations, the mobility of a population, and the postindustrial society. Weekly discussion-laboratory sessions will provide students the opportunity to develop skills to see the relative importance of these factors. Personal computers will be used, with scientifically collected best data sets made available to each student. The course will conclude with considerations of national, state, and local policies that might be influential in developing a better quality of life.

**204 Appropriate Technology and Society** Fall. 3 credits. M W F 10:10. C. Geisler.

The “appropriateness” of technology is a matter of social context and relevance. The course provides an overview of technological epochs as well as changing social contexts. Students will examine both contradictions of, and tributes to, new technologies and, through a series of case studies (e.g., biotechnology, microcomputers, organic farming, etc.) form judgments as to what makes technology appropriate today.

**213 Social Indicators and Data Management** Spring. 3 credits. M W F 11:15. F. W. Young.

A survey of definitions and measures of social indicators. General principles of social-indicator research will be illustrated from data both developed and less-developed countries in the areas of poverty and level of living, nutritional status, inequality, environmental problems, and status restrictions on minorities and women. The course will present measures based on census data, informant surveys, and household surveys, with an emphasis on simple and low-cost techniques. One-third of the course will be devoted to data management, using SPSS and microcomputers.

**242 American Indian Philosophies I: Power and World Views (also Anthropology 242)** Fall. 3 credits. Enrollment limited to 20 students.

Prerequisite: permission of instructor.

T R 10 10–11:25. S. Saraydar.

This course is designed to facilitate an understanding of the world views of American Indians of the past and present. The goal is to provoke edifying discourse that will enable American Indian beliefs concerning the workings of the universe and the relationship of human beings to nature to be understood on their own terms.

**243 American Indian Philosophies II: Native Voices (also Anthropology 243)** Spring. 3 credits. Enrollment limited to 20 students.

T R 10 10–11:25. S. Saraydar.

An exploration of the diverse expressions of philosophy to be found in the words of American Indians. Novels, political treatises, speeches, autobiographies, and other sources reflecting Indian attitudes on a variety of subjects will be examined for beauty and power of expression as well as to identify recurring themes.

**250 Farming as an Occupation** Spring. 1 credit. R 12:20–1:25. G. Colman.

The occupation of farming will be examined through such topics as how farm and family tasks are coordinated, the most important decisions in farming, how a woman gets established in farming, what determines what can be done in a farm operation, how farm people retire, what constitutes success in farming, and how farming differs from other occupations.

**208 Independent Honors Research in Social Science** Fall and spring. 1–6 credits. Limited to students who have met the requirements for the honors program. A maximum of 6 credits may be earned in the honors program.

Students must submit written proposals by the third week of the semester of their senior year to the departmental honors committee representative, C. Geisler.

**301 Theories of Society (also Sociology 401)** Fall. 4 credits. Prerequisites: Rural Sociology 100 or 101, or Sociology 101. S-U grades optional. Not offered 1986–87.

T R 11:15. P. R. Eberts.

A seminar for seniors, juniors, and beginning graduate students, especially in rural sociology and sociology. A survey of major theoretical approaches to the study of society and social institutions, with emphasis on (1) the central concepts of the sociological tradition, (2) major classical theorists (Marx, Durkheim, Weber) and contemporary counterparts, and (3) application of the classical ideas in contemporary research. Applications of theories of society to current research and social problems will be stressed.

**324 Environment and Society** Fall. 3 credits. Not offered 1986–87.

M W F 1:25. F. H. Buttel.

An exploration of various sociological approaches to the study of society and its physical environment and an analysis of major issues relating to the interaction of societies and their resource bases—particularly overpopulation, the energy and food crises, the limits-to-growth debate, the conduct of political struggles over energy and environmental policy, and the impacts of technological and social change in agriculture on environmental quality.

**356 Rural Society in America** Fall. 3 credits. S-U grades optional. Not offered 1986–87.

M W F 9:05. Staff.

A new awareness and image of rural America is examined. The population turmoil in the recent decades is evidence of new significance assigned to physical space, quality of life, and an environment protected for the future. From sociological and historical perspectives the technological changes in American rural society are examined as a prelude to exploring future changes that might be expected for agriculture, the environment, and rural society.

**367 American Indian Tribal Governments (also Anthropology 367)** Fall. 3 credits. Not offered 1986–87.

W 7:30–9:55 p.m. S. Saraydar.

This course focuses on the structure of contemporary tribal governments and the ways in which these governments approach the issues confronting their constituents. The effects of European contact on traditional political organization are detailed, as are the present-day relationships of tribal governments to federal and state governments.

**370 Social Structure of Industrial Change** Spring. 3 credits. M W F 11:15. R. Young.

The course will show how changes in rural industry and consequent changes in rural communities and services are embedded in national changes in regions and industries. Research demonstrates that new rural industry is not resource converting or agricultural as in the past, but footloose, high technology, and for export. Industrial employment and industrial structure are embedded in branch plants of corporations. Consideration will be given to the regional context and change, the U.S. industrial structure, industrial location, corporate structure, multinationals and multinationals, and social problems generated by industry in rural areas.

**380 Independent Honors Research in Social Science** Fall and spring. 1–6 credits. Limited to students who have met the requirements for the honors program. A maximum of 6 credits may be earned in the honors program.

Students must submit written proposals by the third week of the semester of their senior year to the departmental honors committee representative, C. Geisler.

**405 Agriculture, Society, and Biotechnology (also Biology and Society 408)** Spring. 3 credits.

Prerequisites: courses in the social sciences and three courses in the biological or agricultural sciences. Not offered 1986–87.


An examination of socioeconomic aspects of biotechnology in the context of historical patterns of technological change in agriculture in developed and developing countries. The major topics covered include the social organization of biotechnology research, industry-university relationships, and the potential socioeconomic impacts of biotechnology on agriculture.

**425 Gender Relations and Social Transformation** Fall. 3 credits.


A comparative analysis of women's contribution to domestic/housework, agricultural and industrial work as productive processes change internationally. The course emphasizes the configuration of various economic and social sectors and their realignments within countries in response to technology transfer, the transformation of the labor market, and changing family forms.
436 Small Communities: Changing Structures and Quality of Life  Spring. 2—3 credits. Prerequisite: a social science course. S-U grades optional. T 3-35. P. R. Eberts.
Small towns are experiencing a resurgence in attractiveness simultaneously with a transformation in their character. The course examines the effects of such long-range structural trends on the quality of life in smaller communities. Analysis of data on personal happiness and satisfaction.

An analysis of the “graying” of America and the responses of the public and private sectors to the demographic revolution. Examines the interplay between basic and applied knowledge in social gerontology. Explores the formal and informal networks of services, in both rural and urban environments, that help maintain independent living arrangements by the elderly.

The seminar defines social-impact and assessment (SIA) places it in the context of contemporary theories of development, and identifies alternative SIA models. Focus is on the SIA experiences of various groups and communities, especially American Indians. Students will learn certain practical research skills needed in doing SIA and will participate in an SIA simulation exercise.

442 American Indian Philosophies: Selected Topics (also Anthropology 442) Spring. 4 credits. Prerequisite: Rural Sociology or Anthropology 242 or 243 and permission of instructor. Not offered 1986—87. T 1:25—4:30; additional sessions to be arranged. S. Saradjar.
This course provides an opportunity for students to pursue topics of interest from American Indian Philosophies I and II in greater depth. The specific topics to be investigated will be selected by the students in consultation with the instructor prior to the beginning of the semester.

Principal issues to be considered in the course include theories of rural stratification in primarily agricultural and advanced industrial societies; social organization of agricultural enterprises; interrelationships among market and nonmarket, agricultural and nonagricultural activities; and theories of change in stratification. Appropriate for majors in development sociology and international agriculture.

497 Informal Study Fall or spring. 3 credits (may be repeated for credit). Undergraduates must attach to their course enrollment material written permission from the faculty member. May supervise the work and assign the grade. S-U grades optional. Staff.
Informal study may include a reading course, research experience, or public service experience.

606 Contemporary Sociological Theories of Development Fall. 3 credits. M W F 11:15—12:00. C. Geisler.
A review of theory, empirical studies, and policy prescriptions as applied to communities and regions, especially those in less-developed countries. Social ecology, central place theory, the Weberian tradition, dependency/political economy, and structural theory are compared.

618 Research Design Fall. 4 credits. T R 1:25—3:30; lab to be arranged. J. D. Francis.
First of a two-semester sequence (may be taken individually) in graduate methods. This course discusses problems of measurement, the design of instruments, and problems of reliability and validity. Common forms of measuring instruments are discussed. Concludes with an introduction to factorial analysis. Students apply principles to development of a scale. Extensive use of computers.

619 Research Design II Spring. 4 credits. Prerequisite: an introductory methods course and a statistics course.
T R 1:25—3:30; lab to be arranged. J. D. Francis.
The second part of the sequence in introductory graduate methods deals with principles of design, especially nonexperimental designs. An intermediate-level treatment of the following topics: regression, analysis of variance, analysis of covariance, and causal models. Special emphasis is given to use of categorical variables in regression. Students are expected to use actual data to familiarize themselves with data handling and processing. Extensive use of computers.

640 Community and Changing Property Institutions Spring. 3 credits. Not offered 1986—87. W 7—10 p.m. C. Geisler.
The seminar acquaints students with the evolution of property rights beginning in antiquity and with the close association between changing property forms and community arrangements as recognized in both classical and contemporary societies. Readings will cover subjects such as land reform, the changing public interest in land-use regulation, and the “new feudalism” debate.

A survey of social, political, and economic factors in regional development. Theories and case studies from demography, human ecology, social organization, and planning are used to examine the emergence or retardation of regions and their implications for contemporary development and developed societies.

642 Regional Systems and Policy Analysis Spring. 3 credits. Prerequisites: a social or economic theory course, introductory statistics, or permission of instructor. S-U grades optional. Not offered 1986—87. Lec, F 2:20—4:30; disc to be arranged. P. R. Eberts.
A systems analysis of theoretical and research problems arising in communities’ changing social organization. Major theories are examined with attention to their compatibility with modern policy analytic techniques. Topics covered center on the interplay of economic, social-class, and political activities in localities.

Concentrates on a small number of significant commercial crops, examining the institutions and relationships involved in the production process: research, credit, distribution of inputs, the farm operation, processing, transportation, and marketing. Patterns at the farm and community level, including topics such as settlement, land tenure, ethnic groups, class structure, methods of cooperation, small farmers, labor problems, and information networks. Ecological and physical constraints on production.
Emphasis on the influence of national and international economic—on the production process, including the role of government and quasi-government units. Examines the historical circumstances giving rise to the present crop systems. Consideration of what rearrangements of the political, social, and economic structures, both domestic and international, are required for change in crop systems, improvement in production, and increased social welfare.

An analysis of the structural transformations of United States agriculture in the nineteenth and twentieth centuries, particularly in terms of the role of the state in agricultural development. This course emphasizes the historical roots of the socioeconomic problems of contemporary agriculture and examines the prospects for, and limitations of, various strategies for ameliorating these problems.

This course examines the structure and formation of national development priorities in Third World countries in the context of the internationalization and politicization of policy and planning agendas. Major topics considered are the role of international financial institutions, national fiscal and administrative crises, the international debt crisis, the role of donor assistance in shaping national policy, and the politics of policy and planning strategies. Also addressed is the politics of evaluation and the linkage between evaluation practices and policy reforms.

706 State, Economy, and Society Spring. 4 credits. Recommended: one graduate-level course in classical sociological theory. T 7—10 p.m. F. H. Buttel.
Reviews major issues concerning the relations between political and economic institutions, including the political-economic methodologies of the classical sociological theorists, the instrumentalist-structuralist debates on the nature of the state, theories of crisis in advanced capitalism, and the controversies among theorists of unequal exchange, dependency, and imperialism in the world system.

A review of the measurement and scaling, building from work by Thurstone and Coombs to multidimensional measurements. Topics include philosophy of factor analysis, factor-analysis models, factor-design, factor-rotation techniques, and comparison with factor-analysis models. Multidimensional scaling and discriminant analyses are also discussed. As matrix algebra is an integral part of these procedures, class time is devoted to this topic.

715 Design and Data Analysis in Development Research Spring. 3 credits.
This seminar/practicum focuses on deriving valid conclusions from the optimal combination of theory, design, measurement, and statistical tests. Topics include a review of classical research design and alternatives. The use of a variety of data for development research, measurement, controls, interactions and contexts, and organizing the argument. Illustrations and exercises will cover a range of data types and problems. Course requires an extensive comparison of contrast states, subnational comparisons of export agriculture for Africa, informant surveys of rural communities and other medium size units, and household surveys of nutrition. Students will work through one or more computer-based exercises and therefore must know basic statistics and a statistical package. The term paper is a research proposal.

The first part of the course reviews simple and multiple regression. Then extensions of these models are discussed. In the middle part of the course,
consideration is given to violations of assumptions and their effects. Then more-advanced regression concepts are discussed. The middle third of the course deals with recursive and nonrecursive path models. Time-series analysis is the last topic discussed. Computerized laboratories are an integral part of the course.

[721] Ecological Perspectives on Social Change Spring. 3 credits. Not offered 1986–87. Hours to be arranged. E. W. Coward, Jr., F. H. Buttel. Reviews major theoretical traditions in the analysis of societal-environmental relationships and applies these perspectives to public policy and development problems. The theoretical perspectives explored are drawn from human ecology, ecological anthropology, and environmental sociology. Policy issues from developed and developing country settings are examined using ecological perspectives.

[723] Social Movements In Agrarian Society Spring. 3 credits. Not offered 1986–87. W 1:25–4, F. W. Young. The seminar moves from a critical review of current explanatory frameworks (resource-mobilization, political-economy, structuralist) to a research practicum focused on ethnoregional movements, illustrating the possibilities of comparative research based on descriptive accounts. These movements are associated with agricultural and industrial change, as well as shifts in the regional ethnic/class system.

[741] Community Development and Local Control Spring. 3 credits. Not offered 1986–87. W 1:30–4:30, C. C. Geisler. Theories of community growth and decline and the current debate over the place of local control in community development in general are considered. Salient themes include the role of neopopulism in community development, the changing institutions of property as community development occurs, and changing definitions of community.

[751] Applications of Sociology to Development Programs Fall. 3 credits. Not offered 1986–87. R 1:25–4:25, E. C. Erickson. A consideration of problems of implementing change strategies at national, regional, and institutional levels, especially as they relate to rural development. Focus is also on institutional constraints on the sociologist as a researcher, as a strategist, and as a participant and on the different contexts within which developmental change occurs.

[754] Sociotechnical Aspects of Irrigation (also Agricultural Economics 764 and Agricultural Engineering 754) Spring. 3 credits. S-U grades optional. Hours to be arranged. R. Barker, M. L. Barnett, E. W. Coward, Jr., M. Walter. Examines irrigated agriculture and its relation to agricultural development. Emphasis on social processes within irrigation systems and interactions with the social setting. The seminar provides an opportunity to examine systematically the institutional and organizational policy issues associated with the design and operation of systems of irrigated agriculture.

771 Special Seminar Fall or spring. Credit to be arranged. Limited to graduate students; others by permission of instructor.

791 Teaching Experience Fall or spring. 1–3 credits. Limited to graduate students. S-U grades only. Staff. Participation in the ongoing teaching program of the department.

792 Public Service Experience Fall or spring. Credit to be arranged. Limited to graduate students. S-U grades optional. Staff. Participation in the ongoing public service activities of the department.

781–786 Informal Study Fall or spring. Credit to be arranged. Limited to master’s and doctoral degree candidates with permission of the graduate field member concerned. S-U grades optional.

781 Rural Sociology

782 Development Sociology

783 Organization Behavior and Social Action

784 Methods of Sociological Research

881 Research Fall or spring. Credit to be arranged. Limited to master’s and doctoral degree candidates with permission of the graduate field member concerned. S-U grades optional.

871 Statistics and Biometry


Courses in statistics and biometry are offered by the Department of Plant Breeding and Biometry.

200 Statistics and the World We Live In Spring. 3 credits.

Lecs, T R 10:10–11:25; disc, T 1:25 or 2:30, or W 10:10 or 1:25, or R 9:05. Prelims: weeks 6 and 11. Staff.

Major concepts and approaches of statistics are presented at an introductory level. Three broad areas are covered: collecting data, organizing data, and drawing conclusions from data. Topics include sampling, statistical experimental design, measuring, tables, graphs, measures of center and spread, probability, the normal curve, confidence intervals, and statistical tests.


Lecs, M W F 11:15; lab, 1 hour to be arranged. Statistical methods are developed and used to analyze data from the biological sciences. Topics include estimation, hypothesis testing, t-tests, analysis of variance, correlation, and simple and multiple regression analysis. Statistical computing is taught and used throughout the course. Emphasis is on proper use of statistical methodology and interpretation of statistical analyses.

408 Theory of Probability Fall. 4 credits. Prerequisite. Mathematics 106, 108, or 112, or permission of instructor.

Lecs, M W F 10:10; disc, M 3:35. Prelims: weeks 5 and 10. Staff.

An introduction to probability theory: combinatorics, random variables and their probability distributions, generating functions, and limit theory. Biological and statistical applications are the focus. Can serve as either a terminal course in probability or as a foundation for a course in the theory of statistics.

409 Theory of Statistics Spring. 4 credits. Prerequisite. Statistics 408 or equivalent.


The concepts developed in Statistics 408 are applied to provide an introduction to the classical theory of parametric statistical inference. Topics include sampling distributions, parameter estimation, hypothesis testing, and linear regression. Students seeking training in statistical methodology should consider Statistics 601–602.

416 Matrix Algebra I Fall, weeks 1–2. 2 credits. Prerequisite: precalculus mathematics. The course is not permitted after Sept. 20.
models, and variance components. Selected topics from pairwise comparisons among means, transformations of data, response surface methodology, treatment design, weighted regression, balanced incomplete blocks, nonlinear model estimation, random effects models, repeated measurements studies, combining experiments, analysis of categorical data, and multivariate analysis.

603 Statistical Methods III Fall. 3 credits. Prerequisite: Statistics 601 and 602 or permission of instructor. Offered alternate years. Not offered 1986–87. Principles of scientific experimentation, experiment design, sample surveys and questionnaire design, statistical aspects of survival analysis, life tables, statistical analyses for clinical trials, categorical data analysis, including logistic regression, loglinear models, combining contingency tables, and application to case control studies; multivariate analysis; and space-time clustering.


606 Sampling Biological Populations Fall. 1 credit. Prerequisite: Statistics 601 or equivalent. Offered alternate years. D. S. Robson. Standard methods of sample-survey design and estimation are presented, including stratified-random sampling, cluster sampling, double sampling, and variable probability sampling. Special emphasis given to methods of particular utility or specifically designed for biological sampling. Examples are taken from forestry, fisheries, and other biological areas.

607 Nonparametric and Distribution-Free Statistical Methods Spring, ¼ of the term. 1 credit. Prerequisite: Statistics 601 or equivalent. S-U grades optional. Offered alternate years. Not offered 1986–87. Nonparametric and distribution-free alternatives to normal-theory testing procedures are presented: rank tests of location and scale tests for two populations; analyses for completely randomized, randomized blocks, and balanced incomplete blocks designs; comparisons among several means; correlation and regression, and goodness-of-fit tests. Mathematical and statistical analysis of populations and communities; theory and methods. Spatial and temporal pattern analysis, deterministic and stochastic models of population dynamics. Model formulation, parameter estimation, and simulation and analytical techniques.

682 Mathematical Ecology (also Biological Sciences 662) Spring. 3 credits. Prerequisites: a year of calculus and a course in probability. Offered alternate years.

699 Special Problems in Statistics and Biometry Fall, spring, or summer 1 credit or more by arrangement with instructor. Staff.

701 Advanced Biometry Spring. 3 credits. Prerequisites: Statistics 409 and 602. Limited to graduate students; others by permission of instructor. Offered alternate years. Not offered 1986–87. Bioassay methods, including parametric and nonparametric statistical analyses of quantal and graded response to controlled levels of single and multiple factors, including direct and directionals as applied to animal orientation experiments; compartment models and analyses; enzyme kinetics and pharmacokinetic analysis; and bioavailability.

713 Experiment Design Fall. 4 credits. Prerequisites: Statistics 416–417 and 602 or equivalent. Limited to graduate students; others by permission of instructor. Offered alternate years. Not offered 1986–87. Principles and techniques of experimentation, theoretical concepts, extensions and variations of the completely randomized, generalized block, and generalized row-column experiment designs, repeated measures designs, interval estimation for ranked means, transformations, unequal variances, additivity, residual analyses, sample size, variance component analyses, unequal number analyses, the place of orthogonality, balance and confounding in design, model selection, and advanced statistical methodology.

714 Treatment Design and Related Experiment Designs Fall. 4 credits. Prerequisites: Statistics 416–417 and 602. Offered alternate year. Staff. Treatment design, the selection of treatments for an experiment, is divided into factorial, response surfaces, mixtures, and combinations of these. Single-degree-of-freedom contrast matrices, factorial design theory for prime powers and nonprime powers, confounding, split plot, complex confounded designs, lattice designs; deriving from pseudofactorial theory, fractional replication, response surface designs, and analyses for mixtures, including diallel crossing designs, are covered. Statistical analyses involving residual analyses and real data are included. Emphasis is on concepts and applications rather than mathematical manipulations.

717 Linear Models Fall. 3 credits. Prerequisites: Statistics 409 or equivalent, and Statistics 417 and 602. S-U grades optional. Offered alternate years. Not offered 1986–87. M.W. and disc to be arranged. S. R. Searle. Introduction to multinormal variables and distribution of quadratic forms; linear statistical models, estimable functions and testable hypotheses, regression models, experimental design models, and variance component models and combinations thereof.

718 Variance Components Spring. 2 credits. Prerequisite: Statistics 777 S-U grades only. M.W. 12:20. S. R. Searle. Several methods of estimating variance components are explained and compared: for balanced data (equal subclass numbers), the analysis of variance method; for unbalanced data (unequal subclass numbers), the three Henderson methods and the methods of maximum likelihood, restricted maximum likelihood, and minimum norm unbiasedness. Also included are estimation from mixed models, prediction of random variables, the dispersion-mean model, and computer package output for variance component estimation.

799 Statistical Consulting Fall. 2 credits. Limited to graduate students.

860 graduate students; others by permission of instructor. Offered alternate years. Not offered 1986–87. Principles of scientific experimentation, experiment design, sample surveys and questionnaire design, statistical aspects of survival analysis, life tables, statistical analyses for clinical trials, categorical data analysis, including logistic regression, loglinear models, combining contingency tables, and application to case control studies; multivariate analysis; and space-time clustering.

890 Research Fall or spring. Credit to be arranged.

990 Research Fall or spring. Credit to be arranged.

999 Research Fall or spring. Credit to be arranged.

103 General Horticulture Spring. 4 credits. Each lab limited to 25 students. Lecs, M.W.F., lab, T.W. 2–4:25. L. D. Topoleski. Acquaints the student with applied and basic knowledge of horticulture. Primarily for students who want a general knowledge of horticulture but have a limited background in plant science. Includes flower, fruit, and vegetable growing and gardening techniques.

123 Organic Gardening Spring. 2 credits. Each section limited to 20 students. Primarily for students not enrolled in the College of Agriculture and Life Sciences. Prerequisite: permission of instructor. M.T or W 1:25–4:25. W. C. Kelly. Students must be prepared to lead a discussion and work specific to their interests in organic gardening.

210 Vegetable Types and Identification Fall. 2 credits.

211 Commercial Vegetable Crops Fall. 4 credits. Each section limited to 25 students. Prerequisites: Vegetable Crops 103 and Agronomy 260. Field trip fee, not to exceed $20.

319 Fundamentals of Postharvest Physiology, Handling, and Storage of Horticultural Crops (also Agricultural Engineering 319) Fall. 3 credits. Prerequisite: A course in floriculture, pomology, or vegetable crops or permission of instructor.

320 Commercial Harvesting, Handling, and Storage of Vegetables Spring, weeks 6–10. 1 credit. Prerequisite: Vegetable Crops/Agricultural Engineering/Pomology 319.


103 General Horticulture Spring. 4 credits. Each lab limited to 25 students. Lecs, M.W.F, lab, T.W. 2–4:25. L. D. Topoleski. Acquaints the student with applied and basic knowledge of horticulture. Primarily for students who want a general knowledge of horticulture but have a limited background in plant science. Includes flower, fruit, and vegetable growing and gardening techniques.
A study of physical and physiological changes of horticultural crops and how they are modified during marketing. Emphasis will be placed on how the following regulations and market practices influence ultimate quality: marketing orders, marketing chain, marketing chain, and certain type and size of packaging procedures, and the Perishable Agricultural Commodities Act.

401 Vegetable Crop Physiology Fall. 5 credits. Prerequisites: Vegetable Crops 211 and Biological Sciences 242 or equivalents. Lecs., MWF 10:10, lab, M 2-4:25; disc, R or F 1, 2, or 3. H. C. Wien, P. L. Minotti. Subject includes mineral nutrition as influenced by fertilization programs and crop sequence, nutrient interactions and induced deficiencies, growth and development, flowering, fruit setting, growth correlation, senescence, seed germination, photoperiodism, vernalization, and environmental factors affecting growth.

413 Kinds and Varieties of Vegetables Fall. 4 credits. Prerequisite: Vegetable Crops 211 or permission of instructor. Offered alternate years. Not offered 1985-86 (but see Vegetable Crops 610). Lab, W 4:50-6:00. Designed to help students achieve proficiency in the evaluation of vegetable varieties through study of their origins, characteristics, adaptation, and usage. An important part of the course is the study of crops in the field. The vegetable seed industry is also discussed.

421 Plant-Plant Interactions Spring. 3 credits. Each disc limited to 6 students. Prerequisite: any crop production course or permission of instructor. Lecs., MWF 8; disc. R or F 1, 2, or 3. P. L. Minotti. The manner in which plants interfere with other plants is examined with primary emphasis on crop situations rather than natural plant communities. Competitive and chemical interactions are considered between weeds and crops, and crops and associate crops, and also between individuals in monoculture.

499 Undergraduate Research Fall or spring. 1 or more credits, by arrangement. Written permission from staff member directing the work must be obtained before course registration. Hours to be arranged. Staff. Special problems may be elected in any line of vegetable work.

601 Seminar Fall or spring. 1 credit. Limited to graduate students. Required of graduate students majoring or minor in vegetable crops. S-U grades only. R 4:30. Staff.

610 Special Topics in Vegetable Crops: Vegetable Variety Testing Fall, weeks 1-4. 1 credit. Prerequisite: Vegetable Crops 211 or permission of instructor. S-U grades only. Lec, F 8; lab, F 2-4:25. H. C. Wien, D. W. Wolfe. The course will stress principles and techniques of vegetable variety evaluation through study of the crops in the field and at harvest. The vegetable seed industry will be briefly discussed.

612 Advanced Postharvest Physiology of Horticulural Crops Spring. 3 credits. Prerequisite: Vegetable Crops/Agricultural Engineering/Pomology 319. Offered alternate years. Lecs., T-R 10:10. Disc to be arranged. P. M. Ludford. Physiological and biochemical aspects of growth and maturation, ripening, and senescence of harvested horticultural plant parts. Topics include morphological and compositional changes in ripening and during storage life, some physiological disorders, aspects of hormone action and interactions, and a consideration of control.

620 Teaching Experience Fall or spring. 1 or more credits by arrangement with instructor. Hours to be arranged. Staff. Participating in the teaching program of the department.

830 Research Methods in Applied Plant Science Spring. 3 credits. Prerequisite: permission of instructor. Offered alternate years. Not offered 1985-86. T R 9:05-11. Staff. The planning of applied research programs: the advantages and limitations of conventional and experimental designs as they apply to specific research problems. Discussions include a critical interpretation of experimental results from the literature.

801 Master's Thesis Research Fall or spring. Credit to be arranged. S-U grades only. Hours to be arranged. Staff.

901 Doctoral Thesis Research Fall or spring. Credit to be arranged. S-U grades only. Hours to be arranged. Staff.

Related Course in Another Department

Special Topics in Plant Science Extension (Plant Breeding 629)
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<th>Name</th>
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<td>Fahey, Timothy J. Ph.D.,</td>
<td>U. of Wyoming. Asst. Prof.</td>
<td>Agricultural Engineering</td>
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<td>Cooke, J. Robert Ph.D.,</td>
<td>North Carolina State U. Prof.,</td>
<td>Agricultural Engineering</td>
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<td>Conneman, George J. Ph.D.,</td>
<td>Penn State U. Prof.,</td>
<td>Agricultural Economics</td>
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<td>Conrad, Jon M. Ph.D.,</td>
<td>U. of Wisconsin. Assoc. Prof.,</td>
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<td>Cotrell, Thomas H. Ph.D.,</td>
<td>U. of Rochester. Assoc. Prof.,</td>
<td>Food Science and Technology (Geneva)</td>
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<td>Couterly, William P. Ph.D.,</td>
<td>Iowa State U. Prof.,</td>
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<td>Cox, William J. Ph.D.,</td>
<td>Oregon State U. Asst. Prof.,</td>
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<td>Creasy, Leroy L. Ph.D.,</td>
<td>U. of California at Davis. Prof.,</td>
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<td>U. of Texas at Austin. Assoc. Prof.,</td>
<td>Poultry and Avian Sciences</td>
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<td>Horticultural Sciences (Geneva)</td>
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of professional courses within the college is balanced by the breadth of view gained from courses and informal learning in the rest of the University. The college believes that this breadth is an essential element of professional education. This conviction is evident in the form of the curriculum, the methods of teaching, and the extracurricular life of teachers and students.

Facilities
The college occupies Sibley Dome, Olive Tjaden Hall, Rand Hall, and the Foundry. In Sibley are the facilities for architecture, and city and regional planning, as well as certain administrative offices and the Fine Arts Library. The Department of Art is housed in Olive Tjaden Hall. Sculpture and shop facilities are in the Foundry. The Green Dragon, a student lounge, is located in the basement of Sibley Dome. The college has three darkrooms that are available for general use and serve as laboratories for the photography courses. A darkroom fee must be paid by each user. Information about darkroom rules and regulations, hours, and equipment is available in the slide library.

Through the generosity of the late Mrs. Lilian P. Heller, the college also owns the home of William H. Miller, the first student to enroll for the study of architecture at Cornell and later a practicing architect in Ithaca. This building is used to house visiting teachers and guests of the college and for occasional receptions and social events.

Libraries
The Fine Arts Library, in Sibley Dome, serves the College of Architecture, Art, and Planning through its collections on architecture, fine arts, and city and regional planning. The library, with more than 116,000 books, is capable of supporting undergraduate, graduate, and research programs. Some 1,900 serials are currently received and maintained.

A slide library is maintained in Sibley Dome and contains the F. M. Wells Memorial Slide Collection, which consists of extensive files of architectural history slides and a large and growing collection of slides of art and architecture from all parts of the world. The library now includes approximately 300,000 slides.

The facilities of the libraries of other schools and departments on campus and the John M. Olin Library, designed primarily as a research library for graduate students, are also available.

Museums and Galleries
The Herbert F. Johnson Museum of Art was formally opened in May 1973. Although many of its exhibitions and activities relate directly to academic programs of the University, the museum has no administrative affiliation with any department. In this way, its programs freely cross academic boundaries, stimulating interchange among disciplines. With a strong and varied collection and a continuous series of high-quality exhibitions, it fulfills its mission as a new center for the visual arts at Cornell. Art galleries are also maintained in Willard Straight Hall, where loan exhibitions of paintings and graphic work by contemporary artists are held. Current work of students in the College of Architecture, Art, and Planning is shown in the exhibition areas in Sibley Dome and the gallery in Olive Tjaden Hall.

College Academic Policies

Ownership of Student Work
All drawings, models, paintings, graphic art, and sculpture done in the studios and drafting rooms as part of the instructional program are the property of the college until they have been graded and released by the instructor. Certain works may be selected by the college for retention for academic purposes.

Exhibitions of Student Work
Exhibitions of student work will be held each semester as part of the yearly schedule of the Olive Tjaden Hall gallery and the John Hartell Gallery. These may display the work of a specific course or exhibit examples of the best recent work done.

Scholastic Standards
Term by term, a candidate for an undergraduate degree in this college is required to pass all courses in which the student is registered and have a weighted average for the term of not less than C (2.0). The record of each student who falls below the standard will be reviewed by the Student Records Committee for appropriate action, as described below:

1) Warning means that the student's performance is not up to expectations. Unless improvement is shown in the subsequent term, the student may be placed on final warning or may be suspended.

2) Final Warning indicates that the student's record is unsatisfactory. Unless considerable improvement is shown in the subsequent term, the student is subject to dismissal from the college.

3) Suspended: Academic Deficiency The student is dismissed from the college and may not continue studies in the college. A student who has been suspended may apply for readmission after an absence of at least two semesters. Application for readmission is made by letter, addressed to the associate dean, College of Architecture, Art, and Planning. The student must submit evidence that his or her time has been well spent since suspension, and if employed, must submit a letter from an immediate superior. Readmission to the college after being suspended is at the discretion of the Admissions Committee.

4) Dismissed: May Not Reregister, College of Architecture, Art, and Planning The student is dismissed from the college and is permanently prohibited from continuing studies in it. This dismissal does not preclude the possibility of applying for admission to another division of the University.

The above actions are not necessarily sequential. A student who has received a warning may be suspended for academic deficiency at the end of the next term if performance during that time is deemed to be grossly deficient. It is necessary to have a cumulative average of at least C (1.7) for graduation.

Architecture

Professional Degree Program
The first professional degree in architecture in the Bachelor of Architecture. This degree counts toward the professional registration requirements established by the various states and the National Council of Architectural Registration Boards. The professional program is normally five years in length and is designed particularly for people who, before they apply, have established their interest and motivation to enter the field. It therefore incorporates both a general and professional educational base.

The program is oriented toward developing the student's ability to deal creatively with architectural problems on analytical, conceptual, and developmental levels. The sequence courses in design, consisting of studio work augmented by lectures and seminars
dealing with theory and method, are the core of the program. Sequences of studies in human behavior, environmental science, structures, and building technology provide a base for the work in design. In the first three years the student has the opportunity to establish a foundation in the humanities and sciences through electives. During the fourth and fifth years this base may expand and be applied by further studies in these areas. Within the professional program, a basis for understanding architecture in its contemporary and historical cultural context is established.

The structure of the program incorporates considerable flexibility for the individual student to pursue his or her particular interest in the fourth and fifth years. By carefully planning options and electives in the fifth year, it is possible for a qualified student to apply for the last year's work to the Bachelor of Architecture degree and to one of the graduate programs offered in the department. Some students are then able to complete the requirements for the master's degree in one additional year.

**Washington Program**

Fourth- and fifth-year students in good standing who have completed the requirements of the first three years of the curriculum are eligible for a term of study in Washington, D.C. Outstanding third-year students are admitted to the Washington program only by petition and a review of their design record. Courses offered by the department include design, thesis, history, special problems in architectural design, a professional seminar, and professional studies. Additional courses are offered by other departments participating in the program. The program provides a period of intensive exposure to the characterics of urban development within the framework of a design studio. Content concentrates on urban design issues, restraints relative to financing, zoning, development criteria, adaptive reuse, and multiuse developments.

**Overlap Program**

For qualified students the department offers an option that combines the fifth year of the undergraduate program with the first year of the Master of Architecture program. In the fall of the fourth undergraduate year, interested students petition the department to substitute Arch 601–602 for Arch 501–502. At the same time, they complete graduate school applications and submit them with fee and portfolio to the graduate field secretary for architecture. Students accepted into the program may not normally begin until the fall of their fifth year and, once enrolled, may not transfer back into the 501–502 sequence. Following admission into the Overlap Program, students may petition to apply toward the requirements of the master's degree a maximum of 30 credits, including Arch 601–602 and other advanced courses taken in excess of distribution requirements for the Bachelor of Architecture degree.

**Curriculum**

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<td>181 History I</td>
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<td>151 Drawing I</td>
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<td>231 Architectural Elements and Principles</td>
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<td>262 Building Technology, Materials, and Methods</td>
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**Required Departmental Courses**

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<td>3 structures</td>
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<td>1 professional practice</td>
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<td>2 drawing</td>
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**Electives**

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<td>1 design communication: design communication, drawing, computer graphics</td>
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<td>2 principles, theories, and methods</td>
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<td>1 architectural science</td>
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**College**

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<td>1 social science</td>
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<tr>
<td>1 mathematics, physics, or biological sciences</td>
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<td>1 humanities</td>
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</table>

**Free**

Of the electives, 15 credits are to be taken outside the College of Architecture, Art, and Planning and 15 credits may be taken either in or outside the college.

| Total credits | 177 |

**Transfer Students**

Although the program leading to the Bachelor of Architecture is specifically directed to those who are strongly motivated to begin professional study when entering college, it is sufficiently flexible to allow transfers for students who have not made this decision until after they have been in another program for one or two years. Individuals who have already completed an undergraduate degree must also apply to transfer to the Bachelor of Architecture degree program, since the graduate program in architecture requires the Bachelor of Architecture degree or its equivalent for entrance.

Transfer students are responsible for completing that portion of the curriculum that has not been covered by equivalent work. Applicants who have had no previous work in architectural design must complete the ten-term design sequence. Since this sequence may be accelerated by attending summer terms, seven or eight regular terms and two or three summer terms are typically required.

For those who would benefit from an opportunity to explore the field of architecture before deciding on a commitment to professional education, the department offers an introductory summer program that includes an introductory studio in architectural design, lectures, and other experiences designed to acquaint the participants with opportunities, issues, and methods in the field of architecture.

Admission is offered to a limited number of transfer applicants who have completed a portion of their architecture studies in other schools. Each applicant's
Alternative Programs

Bachelor of Fine Arts

After completing the first four years of requirements, the student may choose to receive the degree of Bachelor of Fine Arts (B.F.A.) in architecture.

The first two years of the Bachelor of Architecture program are considered a basic introduction to the field. It is possible after this phase to depart from this program to develop a concentration in some area of the broader field without the intention of becoming a licensed practicing architect. A student choosing the B.F.A. program should apply in writing to the department chairperson by February 1 in the second year. The student will be interviewed and informed of acceptance by March 1.

Bachelor of Science in History of Architecture

The history of architecture major leads to a Bachelor of Science degree, conferred by the College of Architecture, Art, and Planning. The major is intended for transfer students from other programs at Cornell and from colleges and universities outside Cornell. Students in the College of Arts and Sciences may take the major as part of a dual-degree program. The course of study in this major, available to students from a variety of academic backgrounds, offers the opportunity for a vigorous exploration of architecture and its history.

Admission Requirements

Two years of undergraduate study; Arch 181 and 182, or the equivalent; and one 6-credit studio in architecture (or Arch 103, which is available during the fall semester for students with no previous studio work) are required.

Procedure. Students from Cornell who want to transfer to the program may apply at any time. Students from outside the department must apply by February 1 in the second year. They will be interviewed and informed of acceptance by March 1.

Students who want to transfer to the program from outside Cornell must apply to the Department of Architecture by March 15. Applications can be submitted at any time during the academic year. Students are welcome to apply to the college for admission to any department.

Curriculum

A student entering the program selects an adviser from the history of architecture faculty in the Department of Architecture. The student is advised by the student's Special Committee.

200, 300, 400, 500 Elective Design Fall or spring. Projects for students who have not been assigned to a sequence course. Prerequisite: permission of department chairperson. Each student is assigned to a class of appropriate level. M.W.F. 2--6. Staff.

Sequence Courses

101 Design I Fall. 6 credits. Limited to department students. Studios and lecs. M.W.F. 2--6. Staff. An introduction to design as a conceptual discipline directed toward an analysis, interpretation, synthesis, and transformation of the physical environment. Exercises are aimed at developing an understanding of the issues, elements, and processes of environmental design.


301--302 Design V and VI Fall and spring. 6 credits each. Limited to department students. Studios and lecs. M.W.F. 2--6. Staff.

401--402 Design VII and VIII Fall and spring. 6 credits each. Limited to department students. Studios and lecs. M.W.F. 2--6. Staff.

501 Design IX Fall or spring. 6 credits. Limited to department students. Studios and lecs. M.W.F. 2--6. Staff.

503--504 Design IX—Thesis Fall or spring. 6 credits each. Students who have not been assigned to a sequence course. Prerequisite: Architecture 501. Required of B.Arch. candidates who must satisfactorily complete a thesis. Students accepted for admission to the Overlap Program are exempt from the thesis requirement. Studios, M.W.F. 2--6. Staff.

510 Thesis Introduction Fall or spring. 8 credits. Prerequisite: Architecture 501. Required of B.Arch. candidates who must satisfactorily complete a thesis. Students accepted for admission to the Overlap Program are exempt from the thesis requirement. Studios, M.W.F. 2--6. Staff.

515 Thesis I Fall or spring. Prerequisite: Architectural Design 510. Special problems in architectural design. Fall or spring. 6 credits each term. Limited to students who have not been assigned to a sequence course. Prerequisite: permission of department chairperson. Each student is assigned to a class of appropriate level. M.W.F. 2--6. Staff.

516 Thesis II Fall or spring. 6 credits each term. Limited to students who have not been assigned to a sequence course. Prerequisite: permission of department chairperson. Each student is assigned to a class of appropriate level. M.W.F. 2--6. Staff.

517 Thesis III Fall or spring. 6 credits each term. Limited to students who have not been assigned to a sequence course. Prerequisite: permission of department chairperson. Each student is assigned to a class of appropriate level. M.W.F. 2--6. Staff.

518 Thesis IV Fall or spring. 6 credits each term. Limited to students who have not been assigned to a sequence course. Prerequisite: permission of department chairperson. Each student is assigned to a class of appropriate level. M.W.F. 2--6. Staff.

519 Thesis V Fall or spring. 6 credits each term. Limited to students who have not been assigned to a sequence course. Prerequisite: permission of department chairperson. Each student is assigned to a class of appropriate level. M.W.F. 2--6. Staff.

601--602 Special Problems in Architectural Design Fall and spring. 9 credits each term. Limited to students who have not been assigned to a sequence course. Prerequisite: permission of department chairperson. Each student is assigned to a class of appropriate level. M.W.F. 2--6. Staff.
603—604 Special Program in Urban Design Fall and spring. 9 credits each term. Limited to students who have been accepted into the Overlap Program. Registration by petition only.

Departmental Electives

342 (162) Introduction to Social Sciences in Design Spring. 3 credits. Lecs. M W F 9:05. B. MacDougall. An introduction to concepts and methods in the social sciences for architects; how approaches from anthropology, environmental psychology, and sociology can be used in the study and design of the built environment. This course meets distribution requirements for architectural principles, theories, and methods.

641—642 (611—612) Urban Housing Developments 641, fall; 642, spring. 2 credits each term. Limited to fourth- and fifth-year students in architecture and graduate students. Prerequisite: permission of instructor. Not offered 1986—87. Staff.

643 (613) Transportation Fall. 2 credits. Prerequisite: permission of instructor. Not offered 1986—87. Sem, hours to be arranged. Staff. The impact of various transportation forms on the environment is considered from the perspectives of architects, engineers, planners, and human ecologists. Readings and discussions of past, current, and future transportation modes focus on aesthetic and physical aspects.

644 (614) Low-Cost Housing Fall. 3 credits. Prerequisite: permission of instructor. T 2—4.30. H. W. Richardson, F. O. Slate. Aspect of low-cost housing involving engineering, technology, architecture, physical planning, economics, and sociology.

648—649 (618—619) Seminar in Urban and Regional Design 648, fall; 649, spring. 3 credits each term. Limited to fifth-year and graduate students. Not offered 1986—87. Hours to be arranged. Staff and guest lecturers. A broad range of issues and problems of urban and regional development and the context in which the designer functions are surveyed. Selected case studies are presented by the participants and visitors.

Graduate Courses

701—702 (711—712) Problems in Architectural Design Fall and spring. 9 credits each term. Studio and sem, hours to be arranged. W. Goethert. Basic first-year design course for graduate students whose major concentration is architectural design.

703—704 (713—714) Problems in Urban Design Fall and spring. 9 credits each term. Studio and sem, hours to be arranged. C. Rowe and staff. Basic first-year design course for graduate students whose major concentration is urban design.

801 (811) Thesis or Research in Architectural Design Fall or spring. 9 credits. Hours to be arranged. Staff. Second-year design course for graduate students whose major concentration is architectural design.

802 (812) Thesis or Research in Urban Design Fall or spring. 9 credits. Hours to be arranged. C. Rowe and staff. Second-year design course for graduate students whose major concentration is regional design.

Structures

122 (222) Structural Concepts Fall or spring. 4 credits. Prerequisite: Mathematics III or approved equivalent. Lecs and sems, M W F 12:20—1:10. Staff. Fundamental concepts of structural behavior. Statics and strength of materials.

221 (321) Structural Systems I Fall. 3 credits. Prerequisites: Mathematics III and Architecture 122. Lecs and sems, T R 11:15—1:10. Staff. Structural design concepts and procedures for steel building construction.


326 Building Substructure Spring. 3 credits. Prerequisites: Architecture 222 or concurrent registration and permission of instructor. Not offered every year. Sem, hours to be arranged. Staff. The principles of soil mechanics and subsurface exploration. Design of building foundations—footings, piles, and subgrade walls.

Architectural Principles, Theories, and Methods

131 An Introduction to Architecture Fall or spring. 3 credits. Open to out-of-department students only. Hours to be announced. Staff, guest lecturers. "Architecture for nonarchitects." Intended to familiarize non-architecture students with the profession of architecture through lectures, readings, and films. Examines past and present criteria for excellence in architecture and the notable designs and designers who achieve this. Related fields such as urban design, landscape architecture, structural design, interior design, computer graphics, and professional practice will be included.

231 Architectural Elements and Principles Fall. 2 credits. Architecture students must register concurrently in Architecture 201. Studios and lecs, T R 1 3:00—3:25. A. Mackenzie. Theory of the order, perception, and function of architectural space. Discourse on the nature of architectural systems and the multiplicity of ways they can be used to solve architectural problems.

232 Design Methods and Programming Spring. 2 credits. Architecture students must register for this course concurrently with Architecture 202. Studios and lecs, T 13:00—3:25. W. Goethert. Basic methods for developing architectural programs. Programming as a conceptual as well as a descriptive task is emphasized. Basic methods of design. Analytic and synthetic skills are stressed.

331 Special Problems in Principles, Theories, and Methods Fall or spring. Variable credit (maximum, 3). Prerequisite: permission of instructor. Hours to be arranged. Staff. Independent study.


337 Special Investigations in the Theory of Architecture I Fall or spring. Variable credit (maximum, 3). Prerequisite: permission of instructor. Hours to be arranged. Staff. Independent study.

338 Special Topics in the Theory of Architecture I Fall or spring. 3 credits. Prerequisite: permission of instructor. Hours to be arranged. Staff and visiting faculty. Topic to be announced before preregistration.

431 Theory of Architecture Fall. 3 credits. Prerequisite: third-year status.


432 Theory of Architecture Spring. 3 credits. Prerequisite: third-year status.


435 Architecture and Re-presentation Fall. 3 credits. Limited to degree candidates in architecture. Prerequisite: successful completion of Architecture 231—232.

Lecs, disc, and reviews, T R 3:30—4:30. V. Warke. A study of architecture as it functions as a re-presentational art, referring to its past while inferring its present.

635 Critical Theory in Architecture Spring. 3 credits. Prerequisite: permission of instructor. Not offered 1986—87.

Sem, hours to be arranged. V. Warke. An inquiry into the fundamental principles of architectural criticism in theory and practice, with emphasis on the structures of criticism in the twentieth century.

637 Special Investigations in the Theory of Architecture II Fall or spring. Variable credit (maximum, 4). Prerequisite: permission of instructor. Hours to be arranged. Staff. Independent study.

638 Special Topics in the Theory of Architecture II Fall or spring. 3 credits. Prerequisite: permission of instructor. Hours to be arranged. Staff and visiting faculty. Topic to be announced before preregistration.

639 Principles of Design Process Fall or spring. 3 credits. Limited to third-year architecture students and above; students in other colleges must have permission of instructor. Not offered 1986—87.

Sem, M W 10:10—12:05. A. Mackenzie. Analysis of the major theories and techniques of design developed during the past fifteen years, with special emphasis on application to the solution of whole problems in architectural design.

Note: 667—668 Architecture in Its Cultural Context I and II is accepted as a theory course. See the section "Architectural Science and Technology Courses" for description.

Design Communication

Darkroom fees for all photography courses (these fees are subject to change).

In-college students—$50 per term.

Out-of-college students—$50 plus $10 per term course fee.

151 (191) Drawing Fall. 2 credits.

Studios, T R 9:05—11. Staff. Freehand drawing with emphasis on line and perspective representation of form and space.
282 Building Technology, Materials, and Methods
Fall. 3 credits.
Properties of materials—their use and application to the
design of buildings and building systems.
Discussion of various methods of building construction
and assembly.

361 Environmental Controls—Lighting and
Acoustics
Fall. 3 credits each term.
Basic thermal analysis of buildings, human comfort
criteria, energy conservation, passive solar design,
HVAC distribution systems, overview of mechanical
conveying systems and plumbing.

371 Environmental Technology Workshop I
Fall or spring. 2 credits. Not offered every year.
Studio, hours to be arranged. Staff.
The mechanical engineer's task and its relation to the
architectural design process. Full-scale and model
studies of the role of air movement and temperature in
building design. Passive and active solar energy
design.

372 Environmental Technology Workshop II
Fall or spring. 2 credits. Prerequisite or corequisite:
Architecture 362. Not offered every year.
Studio, hours to be arranged. Staff.
The tasks of the acoustical consultant, the electrical
engineer, and the illumination consultant in relation to
the architect's work. Acoustical and lighting design
studies using full-scale mock-ups and specific building
type studies. Cost factors.

[374 (334) Computer Graphics (also Computer
Science 417)]
Spring. 4 credits. Prerequisites: two
terms of calculus and Computer Science 211, or
equivalent. Not offered every year.
Introduction to the principles of interactive computer
graphics, including input techniques, display devices,
display files, interactive graphic techniques, two- and
three-dimensional computer graphics, perspective
transformations, hidden line and hidden surface
algorithms, and color-picture generation.

[378 (338) Computers in Architecture Seminar
Fall or spring. 2 credits. Prerequisites: Computer
Science 100 or equivalent. Not offered 1985–86.
1 hour to be arranged. Staff.
Exploration of the use of computers in a variety of ways
encompassing architectural practice and education.
Use of the computer is not required for this course.

379 (339) Architectural Computer Applications
Fall or spring. 3 credits. Prerequisites: Computer
Science 100 or second-year standing.
Hours to be arranged. M. Cohen.
Introduction to the use of the computer as a tool in the
architectural design process. Experience with
computer applications will be offered.

461 (481) Professional Practice
Fall. 3 credits.
An examination of organizational and management
theories and practices for delivering professional
services. Included is an historic overview of the
professions and a review of the architect's
responsibilities from the precontract phase through
construction. Application of computer technology in
preparing specifications.

462 Professional Seminar
Fall or spring. 3 credits.
Washington Program only.
M. Schack and staff.
Visits to public and private agencies and architectural
firms in Washington and Baltimore. Discussions relative
to the motivations for particular architectural forms and
especially on theories of architecture. Examples from
the United States and Asia.

477–478 (437–438) Special Projects in Computer
Graphics
Fall: 477, spring. Variable credit (maximum, 4).
Limited to third-year students and above.
Prerequisites: Architecture 374 plus concurrent
registration in Computer Science 314 or equivalent, and
permission of instructor.
Hours to be arranged. D. P Greenberg.
Advanced work in computer graphics input and display
techniques, including storage tube, dynamic vector,
and color raster displays.

561 Special Problems in Architectural Science
Fall or spring. Variable credit (maximum, 3).
Prerequisite: permission of science staff instructor.
Topics to be announced. Independent study.

[563 Emerging Methods in Energy-Efficient
Design Fall. 3 credits. Prerequisite: Architecture 362.
State-of-the-art energy-efficient building design
strategies and computational methods to model the
thermal performance of buildings, presented through
case studies of exemplary designs and application of
selected analytical methods to exercises in building
design development.]

[564 Earth-sheltered Architecture
Fall or spring. 3 credits. Not offered 1986–87.
Hours to be arranged. Staff.

[571–572 (531–532) Computer-aided Structural
Design
571, fall; 572, spring. 4 credits each term.
Limited to fourth-year students and above.
Prerequisites: Architecture 374 and Civil and
Environmental Engineering 371–372, concurrent
registration in Civil and Environmental Engineering 673,
and permission of instructor. Not offered 1986–87.
D. P Greenberg.
Advanced topics involving interactive computer
graphics and advanced structural analysis
techniques.]

[573–574 (533–534) Computer-aided
Environmental Design
573, fall; 574, spring. 4 credits each term.
Limited to students in their fourth or
later year. Prerequisites: Architecture 374, 362, one
year of college physics, and permission of instructor.
Staff.
Advanced topics involving interactive computer
graphics and advanced environmental design
techniques. Topics may include acoustics, lighting, and
energy analyses.]

[662 Environmental Control Systems
Fall or spring. 3 credits. Prerequisite: Architecture 362.
Lec and sem, hours to be arranged. Staff.
The influences of the environment on the design of
buildings and urban developments. Lecture and
workshop exercises use the wind tunnel and
artificial sun.]

667–668 Architecture in Its Cultural Context I
and II
667, fall; 668, spring. 4 credits each term.
Prerequisite: permission of instructor.
Fall term, theory; spring term, problem solving and
method. An examination of the relationship between
architecture and other aspects of culture. Emphasis on
the motivations for particular architectural forms and
especially on theories of architecture. Examples from
the United States and Asia.
Graduate Courses

761-762 Architectural Science Laboratory 761, 762, spring. Six credits each term. Open to architectural science graduate students only. Hours to be arranged. Staff. Projects, exercises, and research in the architectural sciences.


Architectural History

The history of the built domain is an integral part of all aspects of the architecture curriculum. From design and theory to science and technology. Incoming students take Architecture 181–182 in the first year, and two additional courses from the 380–390 series, preferably in the third and fourth years. Seminars are intended for advanced undergraduate and graduate students and do not satisfy undergraduate history requirements. Courses, seminars, and special investigations focus on the Western tradition, which constitutes the key intellectual setting for contemporary practice. Building cultures from other parts of the world, often more extensive and far older than that of the West, are studied in special offerings as opportunities in faculty resources become available.

Sequence Courses

181 History of Architecture I Fall. 3 credits. Required of all first-year students in architecture; open to all students in other colleges with an interest in the history of the built domain. Tu T R 11:15–1:10. C. F. Otto. The history of the built environment as social and cultural expression in Western civilization from earliest times to the present. In the fall, themes, theories, and ideas in architecture and urban design are considered on the basis of examples selected instances from Mesopotamia to the seventeenth century.

182 History of Architecture II Spring. 3 credits. Required of all first-year students in architecture. Open to all students in other colleges with an interest in the history of the built domain; may be taken independently of Architecture 181. Tu T R 11:15–1:10. M. Kubelik. The history of the built environment as social and cultural expression in Western civilization from earliest times to the present. In the spring, themes, theories, and ideas in architecture and urban design are considered on the basis of examples selected instances from the eighteenth century to the 1980s.

Freshman Seminar

190 The Language of Architecture Fall or spring. 3 credits. Not for students in the Department of Architecture. Freshman Seminar. Staff. The metaphor of language is used to discuss works of architecture both as formal objects and as carriers of meaning when seen in their cultural contexts. Contemporary and historical examples, including local buildings, are examined to develop skills in visual analysis and in "reading the messages" in architectural design.

191 The Literature of Architecture Fall or spring. 3 credits. Not for students in the Department of Architecture. Freshman Seminar. Staff. The literature of architecture, understood as the testimony of the architects themselves, is drawn on to examine major themes of twentieth-century architecture. Texts are presented according to rhetorical mode within a framework of thematic categories. For example, narrative, descriptive, and potenial readings address the birth of the skyscraper.

Three salient themes in modern architecture are explored in the seminar: the impact of technology and revolution, the skyscraper and dwelling as new types for new needs, and the aesthetic of modern architecture.

Directed Electives

[381 Architecture of the Classical World Spring. 3 credits. Limited to 30 students. Prerequisites: Architecture 181–182 or permission of instructor. Not offered 1986–87; next offered 1987–88. Hours to be arranged. M. Kubelik. The history of architecture and urban design in ancient Mediterranean civilizations, with emphasis on Greece and Rome. The course considers change and transformation of building types and their elements within the general context of social demands.]

382 Architecture of the Middle Ages Spring. 4 credits. (Credit for this course may be obtained by taking History of Art 332.) Prerequisites: Architecture 181–182 or permission of instructor. Not offered 1986–87; next offered 1987–88. M W F 9:00–9:50. R. G. Cahners. A survey of medieval architecture from the Early Christian period to the late Gothic (A.D. 300–1500). Emphasis is given to the development of structural systems, form, function, and meaning of important medieval buildings.

384 The Renaissance Fall. 3 credits. Limited to 30 students. Prerequisites: Architecture 181–182 or permission of instructor. Tu T R 9:05–11: M. Kubelik. History of European architecture and city planning of the fifteenth and sixteenth centuries. Special consideration is given to building types and to internal changes in architecture and urban design, as well as to external influences such as social, economic, and political factors.

[385 The Baroque Spring. 3 credits. Limited to 30 students. Prerequisites: Architecture 181–182 or permission of instructor. Not offered 1986–87; next offered 1987–88. M W 11:15–1:10. C. F. Otto. History, ideas, and theories of architecture and urban design in Europe between 1600 and 1800. Special consideration is given to the contribution and significance of major architects of the time.]

[387 The Nineteenth Century Fall. 3 credits. Limited to 30 students. Prerequisites: Architecture 181–182 or permission of instructor. Not offered 1986–87; next offered 1987–88. Hours to be announced. M. Woods. Examination of the leading trends in Western architectural theory and practice from the rationalist traditions through Art Nouveau.]

388 The Twentieth Century Spring. 3 credits. Limited to 30 students. Prerequisites: Architecture 181–182 or permission of instructor. Not offered every year; next offered fall 1988. Hours to be announced. Staff. The history, ideas, and theories of architecture and urban design in the West during the course of the twentieth century, beginning with reform efforts of the 1890s and concluding with work from the 1980s.


391 American Architecture II Spring. 3 credits. Limited to 30 students. Prerequisites: Architecture 181–182 or permission of instructor. Not offered every year; next offered 1988–89. M W 9:05–11. M. Woods. A continuation of Architecture 390 but may be taken independently. The history of American architecture and urbanism from the Civil War to 1960. Special attention is paid to the dominant cultural, technical, and aesthetic determinants of form as manifested in the work of the major architects of the time.

393 The American Planning Tradition (also City and Regional Planning 462) Fall. 4 credits. Prerequisites: Architecture 181–182 or permission of instructor. Hours to be announced. J. W. Reps. A systematic review of American city planning history, beginning with the earliest colonial settlements and ending with the era of the New Deal. An introductory lecture course requiring no previous exposure to planning or architecture, and a prerequisite for students intending to take advanced seminars or independent studies in planning history.

[396 Special Topics in Architectural History Spring. 3 credits. Limited to 30 students. Prerequisites: Architecture 181–182 or permission of instructor. Not offered 1986–87; next offered 1986–89. Hours to be announced. M. Kubelik. Topic to be announced by preregistration.]

[397 Special Topics in Architectural History Fall. 3 credits. Limited to 30 students. Prerequisites: Architecture 181–182 or permission of instructor. Not offered every year. Not offered 1986–87; next offered 1987–88. Hours to be announced. Staff. Topic to be announced by preregistration.]


[399 Special Topics in Architectural History Fall or spring. 3 credits. Limited to 30 students. Prerequisites: Architecture 181–182 or permission of instructor. Not offered every year. Next offered 1986–87. Hours to be announced. Staff. Topic to be announced by preregistration.]

Courses in Preservation

[582 (542) Methods of Archival Research (also City and Regional Planning 461) Fall. 3 credits. Not offered 1986–87. Hours to be announced. K. C. Parsons. Examination of methods of using archival materials, including documents in the Cornell archives and regional history collections; for research in the history of architecture, historic preservation, and urban development.]

583 (543) Measured Drawing (also City and Regional Planning 567) Fall. 3 credits. For undergraduate architecture students and graduate students in history and preservation. Prerequisite: permission of instructor. Hours to be announced. M. A. Tomlan. Combines study of architectural drawings as historical documents with exercises in preparing measured drawings of small buildings. Presents the basic techniques of studying, sketching, and measuring a building and the preparation of a finished drawing for publication.

584 (544) Problems in Contemporary Preservation Practice (also City and Regional Planning 563) Spring. Variable credit (maximum, 3). Hours to be announced. M. A. Tomlan. A review of stylistic trends and preservation projects and an investigation of areas of expertise currently being developed, presented by staff and guest lecturers.
Seminar in the History of Architecture and Urban Development
Fall or spring. 4 credits.
Prerequisites: permission of instructor.
Hours to be announced. J. Otto.
Topic to be announced.

Seminar in the History of Architecture and Urban Development
Fall or spring. 4 credits.
Prerequisite: permission of instructor.
Hours to be announced. M. Woods.
Topic to be announced.

Seminar in the History of Architecture and Urban Development
Fall or spring. 4 credits.
Prerequisite: permission of instructor.
Hours to be announced. M. Woods.
Topic to be announced.


Undergraduate Thesis in the History of Architecture
Fall or spring. 4 credits.
Prerequisite: permission of instructor.
Hours to be arranged. Staff.

Graduate Independent Study in the History of Architecture and Urban Development
Fall or spring. Variable credit.
Prerequisite: permission of instructor.
Hours to be announced. Staff.
Independent study for graduate students.

M.A. Thesis in History of Architecture and Urban Development
Fall or spring. Variable credit.
Hours to be announced. Staff.
Independent study for the master’s degree.

Ph.D. Dissertation in History of Architecture and Urban Development
Fall or spring. Variable credit.
Hours to be announced. Staff.
Independent study for the doctoral degree.

Art
Students must also complete a senior thesis in one area of concentration and are required to participate in the Senior Exhibition.

The University requirement of two terms in physical education must be met.

A candidate for the B.F.A. degree at Cornell is required to spend the last two terms of candidacy in residence at the University, subject to the conditions of the Cornell faculty legislation of November 14, 1962.

Students who transfer into the undergraduate degree program in art must complete a minimum of four terms in residence at Cornell and a minimum of 60 credits at the University, of which 30 credits must be taken in the Department of Art, including four terms of studio work. No student may study in absencia for more than two terms.

Curriculum

Students are expected to take an average course load of 16 credits per semester during their four years. They must complete a minimum of two courses each in painting, sculpture, printmaking, and photography and four in drawing by the end of the third year. All studio courses may be repeated for credit.

First Year

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<td>Fall</td>
<td>115 Introductory Art Seminar 1</td>
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<td>121 Introductory Painting 3</td>
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<td>141 Introductory Sculpture 3</td>
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<td>151 Introductory Drawing 3</td>
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<td>131 Introductory Etching 3</td>
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<td>132 Introductory Graphics 3</td>
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<td>161 Introductory Photography 3</td>
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Second Year

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<th>Term</th>
<th>Courses</th>
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<tbody>
<tr>
<td>Fall</td>
<td>Art studio (two courses) 6</td>
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<td>Art history elective 3 or 4</td>
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<td>Elective(s) 6 or 7</td>
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<td></td>
<td>Spring Term Art studio (two courses) 6</td>
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<td></td>
<td>Art history elective 3 or 4</td>
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<td>Elective(s) 6 or 7</td>
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<td></td>
<td>Third Year Art studio (one course minimum 3-8)</td>
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<td>Issues of Contemporary Art 3</td>
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<td></td>
<td>Electives 5-10</td>
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<td>Spring Term Art studio (one course minimum 3-8)</td>
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<td>Art history elective 3 or 4</td>
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<td>Elective 4-10</td>
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<td>Fourth Year Fall Term Art studio (four-year studio concentration) 6</td>
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<td>Art history elective 3 or 4</td>
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<tr>
<td></td>
<td>Electives 5 or 6</td>
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</table>

Course Information

Most courses in the Department of Art are open to students in any college of the University who have fulfilled the prerequisites and who have permission of the instructor.

Course fees are charged for all Department of Art courses. For fine arts majors the fee is $20 each semester. Students from outside the department are charged $10 a course. In addition, there are darkroom fees for all photography courses (these fees are subject to change): for in-college students the fee is $50 per semester, and for out-of-college students the fee is $50 plus $10 per term course fee.

In order to take advantage of the special opportunities afforded by summer study, the department has developed several summer-only courses. Students wanting to satisfy Cornell degree requirements may petition to have these courses substituted for fall- or spring-term required courses.

Courses in Theory and Criticism

<table>
<thead>
<tr>
<th>Term</th>
<th>Courses</th>
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</thead>
<tbody>
<tr>
<td>110 Color, Form, and Space Fall or spring 3 credits. Fall enrollment limited to B.F.A. candidates. M 9:30–11. N. Daly. A study of traditional and contemporary ways of drawing and painting. An analysis of color theory and pictorial space.</td>
<td></td>
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<tr>
<td>111 Introductory Art Seminar Fall. 1 credit. Limited to B.F.A. candidates. F 1:25–3. Students meet for one hour each week with a different member of the faculty. The varying artistic interests of the staff are presented and discussed.</td>
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</table>

Issues in Contemporary Art Fall. 3 credits. Prerequisite: third-year standing in Fine Arts Program. Hours to be arranged. S. Poleskie. A seminar course in issues of contemporary art, including lectures by visiting artists.

610 Seminar in Art Criticism Fall or spring. 2 credits; may be repeated for credit. Four terms required for M.F.A. candidates. Hours to be arranged. Staff. Historical and modern critical opinions and their relation to problems in the theory of art are studied.

Studio Courses in Painting

<table>
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<tr>
<th>Term</th>
<th>Courses</th>
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<tbody>
<tr>
<td>121 Introductory Painting Fall, spring, or summer. 3 credits. Hours to be arranged. Staff. An introduction to the problems of artistic expression through the study of pictorial composition; proportion, space, shapes, and color as applied to abstract and representational design.</td>
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<tr>
<td>122 Landscape Painting Summer. 3 credits. Class meets outdoors at selected sites in the Ithaca area. A different motif is explored each week. Pen, pencil, and water- or oil-based colors (optional) are the materials employed. Analysis and discussion of the landscape work of Corot, Cézanne, van Gogh, Seurat, and others are included.</td>
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<tr>
<td>221 Painting II Fall or spring. 3 credits. Prerequisite: Art 121 or permission of instructor. Hours to be arranged. Staff. Study of traditional and contemporary media.</td>
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<tr>
<td>321 Painting III Fall. 4 credits. Prerequisite: Art 221 or permission of instructor. Hours to be arranged. Staff. Continued study of the principles of painting and the selection and expressive use of materials and media. Group discussions and individual criticism.</td>
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<tr>
<td>322 Painting IV Spring. 4 credits. Prerequisite: Art 321 or permission of instructor. Hours to be arranged. Staff. Continued study of the principles of painting and the selection and expressive use of materials and media. Group discussions and individual criticism.</td>
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<tr>
<td>421 Painting V Fall. 6 credits. Prerequisite: Art 322 or permission of instructor. Hours to be arranged. Staff. Further study of the art of painting through both assigned and independent projects executed in various media. Instruction through group discussions and individual criticism.</td>
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</table>

422 Senior Thesis in Painting Fall or spring. 6 credits. Prerequisite: Art 321 or 322 or permission of instructor. Hours to be arranged. Staff. Advanced painting project to demonstrate creative ability and technical proficiency.

721–722, 821–822 Graduate Painting 721 and fall, 722 and 822, spring. Credit as assigned. May be repeated for credit. Limited to M.F.A. students in painting.

Staff: Students are responsible, under staff direction, for planning their own projects and selecting the media in which they are to work. All members of the staff are available for individual consultation.

Studio Courses in Graphic Arts

131 Introductory Intaglio Fall, spring, or summer. 3 credits. Hours to be arranged. E. Meyer. A basic introduction to etching techniques, with emphasis on engraving, lift ground, relief printing, monotypes, and experimental techniques.

132 Introductory Graphics Fall, spring, summer. 3 credits. Hours to be arranged. S. Poleskie. An introduction to the two-dimensional thought process and the language of vision. Students will explore design projects and the use of graphic materials, including collage, pochoir, and screen printing.

133 Introductory Lithography Fall, spring, or summer. 3 credits. Hours to be arranged. G. Page. The theory and practice of planographic, utilizing limestone block and aluminum plate. Basic lithographic techniques of crayon, wash, and transfer art are studied.

231 Intaglio Printing II Fall or spring. 3 credits. Prerequisite: Art 131 or permission of instructor. Hours to be arranged. E. Meyer. Continuation of the study and practice of methods of intaglio printing, with emphasis on techniques and color.

232 Silk-Screen Printing Spring. 3 credits. Prerequisite: Art 132 or permission of instructor. Hours to be arranged. S. Poleskie. Silk-screen printing, including photographic stencils, three-dimensional printing, and printing on metal, plastic, and textiles.

233 Lithography II Fall or spring. 3 credits. Prerequisite: Art 133 or permission of instructor. Hours to be arranged. G. Page. Continuation of the study and practice of planographic printing, with emphasis on color.

331 Printmaking III Fall or spring. 4 credits. Prerequisite: Art 231, 232, or 233 or permission of instructor. Hours to be arranged. Staff. Study of the art of graphics through both assigned and independent projects. Work may concentrate in any one of the graphic media or in a combination of media.

332 Printmaking IV Fall. 4 credits. Prerequisite: Art 331 or permission of instructor. Hours to be arranged. Staff. Continuation and expansion of Art 331.

431 Printmaking V Spring. 6 credits. Prerequisites: Art 332 or permission of instructor. Hours to be arranged. Staff. Further study of the art of graphics through both assigned and independent projects executed in various media. Instruction through group discussions and individual criticism.
Various materials, including clay, plaster, wood, and modeling, abstract carving, and other aspects of three-dimensional design. Prerequisites: Art 141 or permission of instructor.

**341 Sculpture I** Fall or spring. 3 credits. Prerequisites: Art 141 or permission of instructor. Hours to be arranged. Staff. A studio course in three-dimensional design. Modeling in Plasteline, building directly in plaster, and casting in plaster.

**342 Sculpture II** Fall or spring. 3 credits. Prerequisites: Art 141 or permission of instructor. Hours to be arranged. Staff. A studio course in three-dimensional design. Modeling in Plasteline, building directly in plaster, and casting in plaster.

**343 Sculpture III** Fall. 4 credits. Prerequisite: Art 241 or permission of instructor. Hours to be arranged. Staff. Continued study of the principles of sculpture and the selection and expressive use of materials and media. Group discussions and individual criticism.

**344 Sculpture IV** Spring. 4 credits. Prerequisite: Art 241 or permission of instructor. Hours to be arranged. Staff. Continuing and expansion of Art 341.

**345 Sculpture V** Fall. 6 credits. Prerequisite: Art 342 or permission of instructor. Hours to be arranged. Staff. Further study of the art of sculpture through both assigned and independent projects executed in various media. Instruction through group discussions and individual criticism.

**346 Senior Thesis in Sculpture** Fall or spring. 6 credits. Prerequisite: Art 341 or 342 or permission of instructor. Hours to be arranged. Staff. Advanced sculpture project to demonstrate creative ability and technical proficiency.

**371 Independent Studio** Fall, spring, or summer. Variable credit (maximum, 5). Students may register for two studios in a semester. May be repeated for credit. Prerequisite: written permission of instructor. Department staff.

**372 Special Topics in Art Studio** Fall, spring, or summer. Variable credit (maximum, 6). Hours to be arranged. Staff. An exploration of a particular theme or project.

**City and Regional Planning**

W W Goldsmith, chairperson; L Beneria, R S Booth, P Clavel, S Czarnanski, J F Forester, B G Jones, D B Lewis, D W Nellis, P Olatidakula, K C Parsons, J W Reis, S Saltzman, S W Stein, I R Stewart, M A Tomlan, T Vietorisz (visiting) The department offers several programs of study at both the undergraduate and graduate levels.

**462 Senior Thesis in Photography** Fall or spring. 6 credits. Prerequisite: Art 361 or 362 or permission of instructor. Hours to be arranged. S Bowman. A studio course intended for photography majors and other qualified students. Advanced photography project to demonstrate creative ability and technical proficiency.

**Studio Courses in Drawing**

**151 Introductory Drawing** Fall, spring, or summer. 3 credits. Hours to be arranged. Staff. A basic drawing course in the study of form and techniques. Contemporary and historical examples of figure drawing are analyzed in discussion.

**158 Conceptual Drawing** Summer 3 credits. Emphasis on drawing from the imagination. The generation of ideas and their development in sketches is stressed. The intent is not to produce finished art but rather to experience a series of problems that require image and design concepts different from those of the artist working directly from nature.

**159 Life and Still-Life Drawing** Summer 3 credits. The human figure, imagery, and still life are studied both as isolated phenomena and in relation to their environment. Focuses on helping the student observe and discover.

**251 Drawing II** Fall or spring. 3 credits. Prerequisites: Art 151 or permission of instructor. Hours to be arranged. Staff. A continuation of Art 151 but with a closer analysis of the structure of the figure and a wider exploitation of its purely pictorial qualities.

**351 Drawing III** Fall or spring. 3 credits. Prerequisite: Art 251. Not offered 1986–87. S. S. Bowman.
The Undergraduate Program in Urban and Regional Studies

The four-year Bachelor of Science in urban and regional studies offers students an opportunity to direct their education toward an understanding of urban problems and solutions. The curriculum acquaints students with the physical, social, political, economic, and environmental forces that confront cities and regions and contribute to their growth and decline. The curriculum draws on strengths in the department and is supplemented by course work in related areas in other departments at Cornell.

The first two years in this program are a general education in the liberal arts and sciences. Writing and quantitative skills are developed, and an exposure is provided to course work in the natural and social sciences, design professions, and humanities. Two introductory courses in urban and regional issues are also taken during the first two years. During the junior and senior years ten specific courses are taken to provide a significant foundation of knowledge in the major. Additional directed electives will permit the student to gain greater depth of knowledge and acquire a broader understanding of topics of individual interest. These courses may be in any related subject, including, for example, housing, urban design, neighborhoods, energy, environmental controls, economic development, architecture, land use, social policy, and international planning.

Basic Requirements for Graduation

1) General education (during the first four terms)
   a. Freshman Seminars: 6 credits
   b. Foreign language: qualification in one foreign language
   c. An approved course sequence (minimum of 6 credits) in each of the four categories below: 30 credits
      1. a. Biological sciences or b. Physical sciences
      2. a. Social sciences (other than economics) or b. History
      3. a. Humanities or b. Expressive arts and design
      4. Mathematics
      5. Economics

2) Major concentration: 50 to 52 credits
   a. Specific course requirements (38 to 40 credits)
      CRP 100, The American City: Crisis and Opportunity
      CRP 101, World Cities
      CRP 315, The Progressive City
      CRP 320, Introduction to Quantitative Methods I
      CRP 321, Introduction to Quantitative Methods II
      CRP 340, Planning, Power, and Decision Making, or Government 311, Urban Politics
      CRP 361, Seminar in American Urban History, or History 332 or 333, The Urbanization of American Society
      CRP 381, Urban Aesthetics
      CRP 400, Introduction to Urban and Regional Theory
      CRP 401, Urban Political Economy
      CRP 480, Environmental Politics
      CRP 482, Urban Land Use Concepts
   b. Directed electives (related to urban and regional studies)

3) Free electives: 26 to 28 credits
   a. 12 credits during first four terms
   b. 14 to 16 credits during last four terms

Required courses for graduation: 34
Required credits: 120

The University requirement of two terms of physical education must be met during the first two terms.

Honors Program

Each year a small number of well-qualified junior-year students will be accepted into the honors program. Each honors student will develop and write a thesis under the guidance of his or her faculty adviser. There will be a seventy-five-page limit on each honors thesis.

Off-Campus Opportunities

Cornell-in Washington Program. Students in good standing may be eligible to earn degree credits in the Cornell-in-Washington program through course work and an urban-oriented internship in Washington, D.C. Students may work as interns with congressional offices, executive-branch agencies, interest groups, research institutions, and other organizations involved in the political process and public policy. Students also select one or two other seminars from such fields as government, history, economics, human development and family studies, architectural history, and agricultural economics. All seminars are taught by Cornell faculty members and carry appropriate credit towards fulfillment of major, distribution, and other academic requirements.

Cornell abroad. Cornell encourages qualified undergraduates to study abroad in the belief that an international perspective is an important component of a good education. In an increasingly interdependent world, the experience of living and learning in a foreign country is invaluable. With this in mind, the University is continuing to develop study abroad opportunities. Current programs are available in Great Britain, Spain, and Germany. Undergraduate programs are available in Asia, the Middle East, and France. The department encourages its students to explore these opportunities.

Research and fieldwork. Students are welcome to work with department faculty members on research or other opportunities that are appropriate to their particular interests. Many fieldwork and community-service options are exist for students in the Urban and Regional Studies Program.

Additional Degree Options

Linked degree options. Urban and regional studies students have the opportunity to earn both a Bachelor of Science degree and a Master of Regional Planning (M.R.P.) degree. Ordinarily the professional M.R.P. degree requires two years of work beyond that of the baccalaureate degree. This arrangement shortens that time by about one year. A minimum of 30 credits and a master's thesis or thesis project are required for the M.R.P. degree. Students apply to the Graduate School, usually in the senior year.

Dual degree option. A student in the Cornell College of Arts and Sciences currently can earn both a B.A. in an arts college major, plus a B.S. in urban and regional studies in a total of five years. Special requirements have been established for this dual degree program. Cornell students interested in pursuing this dual degree program should contact either the director of the Urban and Regional Studies Program or the appropriate dean of the College of Arts and Sciences for further information.

Admissions Requirements and Procedures

Among the most important criteria for admission to the Urban and Regional Studies Program are intellectual potential and commitment—a combination of ability, achievement, motivation, diligence, and use of educational and social opportunities. Nonacademic qualifications are important as well. The department encourages students with outstanding personal qualities, initiative, and leadership ability. Above all, the department seeks students with a high level of enthusiasm and depth of interest in the study of urban and regional issues. Applicants must complete a University admission application.

Transfer Students

In most cases, transfer applicants should no longer be affiliated with a high school and should have completed no fewer than 12 credits of college or university work at the time of application. A high school student who has completed graduation requirements at midyear and is taking college courses for the rest of the academic year should apply as a freshman. Prospective candidates who believe that their circumstances are exceptional should consult with the director of admissions in the Cornell division of interest to them before filing an application.

Forms for transfer application and financial aid are available from the Cornell University Office of Admissions, 410 Thurston Avenue, Ithaca, New York 14850-2488. Official transcripts of all high school and college work must be submitted along with SAT or ACT scores and letters of recommendation.

It is desirable for prospective transfers to have taken at least 6 credits in English. In addition, students should have taken basic college-level courses distributed across the natural and social sciences, humanities, and mathematics. Those applicants whose previous course work closely parallels the general education portion of the urban and regional studies curriculum will have relative ease in transfer. However, as there are no specific requirements for transfer, students with other academic backgrounds, such as engineering, agriculture, arts, design, and agriculture, are eligible to apply.

Although an interview is not required, applicants are urged to visit the campus. Applicants who wish further information regarding urban and regional studies may contact Professor Richard S. Booth, Program Director, Urban and Regional Studies, Cornell University, 106 West Sibley Hall, Ithaca, New York 14853-6701 (telephone: 607/255-4331).

The Graduate Program in City and Regional Planning

Planning seeks to guide the development of the economic, social, natural, and built environments in order that some of the needs and aspirations of people may be better satisfied. Most of the activities in the program focus on a broad range of issues that are often subsumed under the labels of urban, regional, or social policy. Planning is an additional area in which students may be interested in which the department encourages the integration of related planning activities.

Land use and environmental and urban development planning are concerned with physical facilities, as well as social and economic forces that affect the environment, and with the processes of development, plan making, and administration.

History and historic preservation planning is a special program of study preparing students for work in history, analysis, and preservation of buildings, urban environments, and neighborhoods, including downtown business areas.

Regional planning and regional science are concerned with socioeconomic issues and functional planning at the regional level, the forces that generate economic growth and social development, and the ways in which resources can be best used.

Local economic policy is concerned with understanding and influencing the economic change, which may be harnessed to the benefit of communities, counteracting plant closings and more regional decline and stimulating more equitable programs of socioeconomic change and development.

Social policy is concerned with the social decision processes involved in planning.

International planning is an additional area in which the department offers a broad range of courses.

City and Regional Planning 89
Several graduate degrees are offered: the Ph.D.; the Master of Regional Planning [M.R.P.], for a two-year program; the Master of Arts [M.A.] in historic preservation planning, for a two-year program; and, in special cases, the Master of Professional Studies (International Development) [M.P.S. (I.D.)], for the twelve- to eighteen-month international planning program.

Graduate Courses and Seminars
Most courses in the Department of City and Regional Planning are open to students in any college of the University who have fulfilled the prerequisites and have the permission of the instructor.

There are two components to city and regional planning course numbers: (A) Courses numbered from 500–599 and 600–699 are generally considered to be introductory or first-year courses; those numbered from 700–799 and 800–899 are generally considered to be more advanced. (B) Courses are grouped (by the tens digit of the course number) to represent the underlying structure of the planning curriculum as follows: theory and quantitative methods (0, 1, 2), program areas (3, 4, 5), and interprogram topics (6, 7, 8, 9).

The department attempts to offer courses according to the information that follows; however, students should check with the department at the beginning of each semester for the latest changes.

Course Information
Most courses in the Department of City and Regional Planning are open to students in any college of the University who have fulfilled the prerequisites and have the permission of the instructor.

The department attempts to offer courses according to the information that follows; however, students should check with the department at the beginning of each semester for the latest changes.

Urban and Regional Theory

100 Introduction to Urban and Regional Studies
Fall. 3 credits.
Staff. (3, 4, 5, and 9).
An introduction to the field of urban and regional studies, including the history of the development of cities and regions and the major intellectual concepts that have shaped the field of study. Review and analysis of current problems facing cities and regions in the U.S. and other countries. Topics covered under current problems will vary each year.

200 Research Methods in Urban and Regional Studies
Fall. 3 credits.
Staff. (3, 4, 5, and 9).
An introduction to alternative research strategies and methods for increasing our knowledge and understanding of urban and regional problems. The role of the scientific approach, hypothesis formulation, empirical methods, and the research process will be explored. Alternative implementations of the research process as related to urban history and to both qualitative and quantitative aspects of urban analysis will be examined in the context of current urban issues. The differences between scholarly and policy research will be examined.

315 The Progressive City (also CRP 815)
Spring. 3 credits.
P. Clavel.
A review of attempts to incorporate the interest of working class and poor constituencies through majority control of local governments. Topics to be covered include the role of the city in class formation; historical perspectives on urban political administration; contemporary populist, socialist, and progressive urban governments; and the search for an economic basis for progressive reforms.

320 Introduction to Quantitative Methods I (also CRP 624)
Fall. 3 credits.
S. Saltzman.
An introduction to the role and use of quantitative methods in the study of urban and regional issues. Emphasis will be on statistical, mathematical, and computer methods for the formulation, analysis, testing of hypotheses and models of social, economic, and physical phenomena of cities and regions. Applicable methods in probability, descriptive statistics, estimation, hypothesis testing, piography, and techniques for decision analysis will be introduced. The use of the computer as an aid in computation and modeling will also be covered in parallel with these methods and techniques.

321 Introduction to Quantitative Methods II (also CRP 825)
Spring. 3 credits. Prerequisite: CRP 320 or permission of instructor.
S. Saltzman.
A continuation of City and Regional Planning 320.

340 Planning, Power, and Decision Making
Fall. 3 credits.
An introduction to the administrative and political environment in which urban and regional issues occur. Starting from an analysis of decision procedures, the course then goes on to describe the characteristic administrative and political institutions in which issues on urban and regional problems take place; some of the major patterns of urban growth are also covered. The course then examines the role of the urban planner in these decision processes.

361 Seminar in American Urban History (also CRP 662)
Spring. 3 credits. Prerequisite: permission of instructor.
Seminar in the historical evolution of the American city. Emphasis on factors in urban growth, the process of urbanization, the urban reform movement, and intellectual and social responses to the city.

400 Introduction to Urban and Regional Theory
Fall. 4 credits. Open to juniors and seniors.
B. G. Jones.
An introductory review of theories dealing with the spatial distribution of population and economic activity, drawn from various social science disciplines such as geography, economics, and sociology. Review of recent research dealing with population distribution, migration, location of industry and economic activity, and the spatial organization of urban and regional social systems.

404 Urban Economics (also CRP 604)
Fall. 4 credits. Prerequisite: basic economics.
T: 10–12, 12–15, optional workshops.
S. Czarnikoski.
Urban phenomena are analyzed from an economic point of view. Areas examined include economic aspects of urbanization processes and policies, determinants of urban growth and decline, urban land and housing markets, urban transportation, and urban public services. Some time will be spent in discussing problems of cities in developing countries.

411 Introduction to Planning (also CRP 511)
Fall. 4 credits. Not offered 1986–87.
M W F 10:10-12:05. P. Clavel.
The origins, history, programs, and contemporary issues of city and regional planning in the United States. Conceptions of the state, the role of planners in public action, and the dominant methods and values of planners are discussed and critiqued.

440 The Impact and Control of Technological Change (also Economics 302 and Government 302)
Spring. 4 credits. Cosponsored by the Program on Science, Technology, and Society.
Social, environmental, and economic implications of technological change in the context of present policies and strategies of control. Several specific cases are considered in detail, followed by investigation of the problems of a modern technological society. Alternative political and economic solutions are explored.

442 Social and Political Studies of Science (also Sociology 355)
Spring. 3 credits.
A view of science less as an autonomous activity than as a social and political institution. We will discuss such issues as science and society, ethics and value disputes, and the limits to scientific inquiry in the context of the changing relationships between science and the public.

445 Introduction to Public Policy Analysis and Management
Fall or spring. 3 credits. A first-year graduate course open to seniors and juniors.
S. Saltzman.
An introduction to systematic methods and processes for analyzing issues and problems of public policy and management. The roles of economic analysis and of analytic techniques in public sector decision making will be reviewed and their respective strengths and weaknesses evaluated. Applications to a variety of public sector problems will be explored.

452 Urban Policy, Planning, and Design in Practice
4 credits. Cornell-in-Washington course. Fall or spring.
K. C. Parsons.
Study and discussion of selected policy-issue areas and programs in city and regional planning and urban design. The historical context of issues and ideas will be covered in addition to critical reviews of specific programs such as equal access to housing, central city revitalization, neighborhood planning, urban esthetics, transportation policy, etc. Field trips to selected projects in Washington and Baltimore.

[461 Methods of Archival Research (also Architecture 582)
Fall. 3 credits.
Examination of methods of using archival materials, including documents in the Cornell archives and regional history collection, for research in the history of architecture, historic preservation, and history of urban development.

462 The American Planning Tradition (also Architecture 393)
Fall. 4 credits.
A seminar on the American city planning history, beginning with the earliest colonial settlements and ending with the era of the New Deal. An introductory lecture course requiring no previous exposure to planning or architecture, and a prerequisite for students intending to take advanced seminars or independent studies in planning history.

[470 Third World Urbanization
W. W. Goldsmith and staff.
Study of rapid growth and contemporary crisis in the giant cities of the underdeveloped countries. Examination of the anomalous systems of planning for employment, housing, and social services. Analysis of the relations of profits to poverty, industrialization to the "informal sector," and the global economy to domestic politics. Case studies from Brazil, China, Cuba, Nigeria, the Philippines, and Venezuela.

480 Environmental Politics
Spring. 3 credits.
M W F 11:10-12:05.
P. Clavel.
Examines the politics of public decisions affecting the environment. Focuses on the roles played by different political actors, the powers of various interest groups, methods for influencing environmental decisions, and the political and social impacts of those decisions.

481 Urban Aesthetics
Spring. 3 credits.
T R 10–11. Staff.
Investigation of historical and current thought about the visual aspects of cities, including evaluation of
Planning is a form of social intervention. It parallels and concentrates on recent developments.

Graduate Courses and Seminars

Urban and Regional Theory

500 Urban and Regional Theory Spring. 4 credits. Prerequisite: intermediate-level economics or sociology or CRP 400. T R 3:30-5:30. W. W. Goldsmith. A review of attempts by the various social sciences to understand the contemporary city and its problems, particularly as seen by planners. Material is drawn from urban and regional economics, human ecology, urban sociology, psychology, anthropology, and geography in order to explain the location, size, form, and functioning of cities. Traditional and contemporary critical theory is examined as it applies to physical, social, and economic problems of the modern city. Major tests will be read, critiqued for this seminar. Students will participate in teams to work on current planning problems.

604 Urban Economics (also CRP 404) Fall. 4 credits. Prerequisite: basic economics. T 10:10-12:05, plus optional workshops. S. Czarnaski. Understanding phenomena are analyzed from an economic point of view. Areas examined include economic aspects of urbanization processes and policies, determinants of urban growth and decline, urban land and housing markets, urban transportation, and urban public services. Some time will be spent in discussing problems of cities in developing countries.

708 Fieldwork or Workshop in Urban and Regional Theory Fall or spring. Variable credit. Staff. Work on problems in urban and regional theory in a field or laboratory setting or both.

709 Special Topics in Urban and Regional Theory Fall or spring. Variable credit. Staff.

800 Advanced Seminar in Urban and Regional Theory I Fall. 3 credits. Prerequisite: CRP 500. M 3:35-5:30. B. G. Jones. The theory of urban spatial organization. Economic, technological, and social factors leading to urbanization and various kinds of spatial organizations are explored. Major theoretical contributions to the understanding of intraregional and intrurban distribution of population and economic activity are reviewed.

801 Advanced Seminar in Urban and Regional Theory II Spring. 3 credits. Prerequisite: CRP 800. M 3:35-5:30. B. G. Jones. A continuation of City and Regional Planning 800, concentrating on recent developments.

809 Informal Study in Urban and Regional Theory Fall or spring. Variable credit. Staff.

Planning Theory and Politics

510 Introduction to Planning Theory Spring. 4 credits. Staff. Planning is a form of social intervention. It parallels and complements other important decision-making institutions such as voting, interest-group bargaining, and market exchange. This course provides cases and analysis describing examples of alternative forms of planning and the various arguments used to justify planning: market failure, democratic participation, advocacy, and expert judgment. Political, organizational, and practical-ethical aspects of planning practice are explored. The course covers the work of Dyckman, Piven, Krumholz, Marcuse, Lindblom, Friedmann, March, and others.

[511 Concepts and issues in Planning Practice Fall. 4 credits. Not offered 1986-87. P. Clavel. A seminar for graduate students and others interested in an in-depth introduction to the main ideas and concepts that underlie the practice of city and regional planning. Weekly discussions will focus on selected articles and books. Interrelationships between national, state, and local practices and policies, and developments in methodology, organization, and the political environment will be explored.]

614 Neighborhood and Community Theory Spring. 4 credits. Not offered 1986-87. Staff. An examination of contemporary social and economic conditions of neighborhoods; community differentiation, reinvestment and revitalization policies and practice; community control, and the role of the community in the provision of goods, services, and social support.

615 The Progressive City (also CRP 315) Spring. 3 credits. P. Clavel. A review of attempts to incorporate the interests of working class and poor constituencies through majority control of local governments. Topics to be covered include the role of the city in class formation; historical perspectives on urban political administration; contemporary populist, socialist and progressive urban governments; and the search for an economic basis for progressive reforms.

[710 Politics of the Planning Process Spring. 4 credits. Not offered 1986-87. W 2:30-4:25. P. Clavel. Analysis of planning and political institutions in selected subjects and policy areas, relating national and subnational levels. Subjects are drawn from such areas as environmental control and use policy, industrial development, transportation, and community development. Theories of planning and politics are compared for their analytical usefulness in these areas.]

[711 Planning and Organization Theory Fall. 4 credits. Not offered 1986-87. R 3:35-5:30. P. Clavel. An examination of organizational and administrative models relevant to plan formation and implementation. Applications are made to such programs as community development, regional administration, urban renewal, and land-use control.]

718 Fieldwork or Workshop in Planning Theory and Politics Fall or spring. Variable credit. Staff. Work on problems in planning theory and politics in a field or laboratory setting or both.

719 Special Topics in Planning Theory and Politics Fall or spring. Variable credit. Staff.

810 Advanced Planning Theory Fall. 3 credits. Prerequisite: CRP 500 or 710. F 3:35-5:30. B. G. Jones. A survey of the works of scholars who have contributed to current thinking about planning theory. Alternative assumptions concerning models of man and theoretical concepts concerning the nature of planning today are considered.

819 Informal Study in Planning Theory and Politics Fall or spring. Variable credit. Staff.

Quantitative Methods and Systems Analysis

520 Mathematical Concepts for Planning Fall. 1-4 credits. Prerequisite: permission of instructor. Mathematics 201 and Sociology 420 are acceptable substitutes for this course. T R 9:05-11. Staff. Intended for students having little or no background in college mathematics. Basic concepts in matrix algebra, calculus, and probability are covered in self-contained units of one credit each. Students may register for any or all of these topics.

521 Introduction to Computers in Planning Fall. 4 credits. Staff. An introduction to the use of computers in the problem-solving and planning processes. Students run programs using PL/1 or another appropriate programming language. Brief introduction to computer systems and the use of library routines. Advantages and limitations of using computers are considered.

620 Planning Analysis Spring. 4 credits. M W F 10:10; lab, T 2:30-4:25. B. G. Jones. A survey of commonly used techniques for analyzing various aspects of subnational socioeconomic systems, emphasizing planning applications.

621 Data Base Processing for the Social Sciences and Planning Fall. 3 credits. Prerequisite: CRP 521 or equivalent, or permission of instructor. S. Saltzman and staff. An introduction to large-scale, machine-readable data bases that focus on regional and national social, demographic, and economic information. The use of code books to represent the organization and structure of such data bases will be reviewed. Methods and procedures for accessing and analyzing information in these data bases using JCL, Job Control Language and SAS (Statistical Analysis System) on mainframe computers will be introduced. The use of microcomputers in these types of applications will also be discussed. Students use a data base archived on campus.

622 Information Systems and Microcomputers for Planning and Policy Analysis Spring. 3 credits. Prerequisite: CRP 521 or equivalent, or permission of instructor. S. Saltzman. An introduction to the design and use of computer-based information systems for planning and policy analysis. The focus of the course will be on the design and use of data base systems for organizing, storing, retrieving, and analyzing information using microcomputers and, secondarily, mainframe computers. Applications of information systems in public and not-for-profit institutions will be reviewed. Students will be expected to complete a term project on a microcomputer using an appropriate programming language.

[623 Methods of Social-Policy Planning Fall. 3 credits. Prerequisite: CRP 521 or equivalent. Not offered 1986-87. Staff. An examination of methodologies of needs assessment, programming, and evaluation suitable for social planning problems. Many of the methodologies, survey research, social area analysis, and social indicators have been drawn from other social science disciplines but are applied to policy and planning issues. Others, such as needs assessment, social impact assessment, goal attainment, PPBS, and PERT, were developed directly or were adapted for use in social planning.]
642 Statistical Analysis for Planning and Public Policy I (also CRP 320)  Fall. 3 credits. Prerequisites: CRP 520 or equivalent and permission of instructor. Staff. An introduction to basic methods of statistical analysis, with an emphasis on their use in the decision-making process in planning. Material in descriptive statistics, sampling, estimation, hypothesis testing, and prediction will be introduced.

625 Statistical Analysis for Planning and Public Policy II (also CRP 321)  Spring. 3 credits. Prerequisite: CRP 624. Staff. Continuation of City and Regional Planning 624.

720 Quantitative Techniques for Policy Analysis and Program Management  Fall. 4 credits. D. Lewis. Selected analytical techniques used in the planning and evaluation of public policy and public investments are examined. Topics include simulation modeling, benefit-cost and cost-effectiveness analysis (including capital budgeting), and optimization strategies.

721 Simulation in Planning and Policy Analysis  Fall or spring. 3 credits. Prerequisite: CRP 521 or equivalent. S. Saltzman. Theory and application of simulation models in policy and planning analysis. Various approaches drawn from discrete stochastic simulation, econometric simulation, microanalytic simulation, and urban dynamics are evaluated. Applications in design, land use, regional development, and social policy are considered. Students run their own programs on the Cornell computer.

722 Decision Analysis for Policy Planning and Program Management  Spring. 4 credits. D. Lewis. An examination of selected techniques for analyzing complex dynamic decision problems in the planning context. Topics include dynamic programming (deterministic and probabilistic), integer programming, and process simulation (queueing models).

728 Fieldwork or Workshop in Systems Planning and Analysis  Fall or spring. Variable credit. Staff. Work on applied systems planning problems in a field or laboratory setting or both.

729 Special Topics in Quantitative Methods and Analysis  Fall or spring. Variable credit. Staff.

829 Informal Study in Quantitative Methods and Analysis  Fall or spring. Variable credit. Staff.

Regional Development Planning

530 Introduction to Regional Development Planning  Fall. 3 credits. Prerequisite: CRP 500. Not offered 1986–87. Staff. An introduction to the history, theories, methods, and processes of regional development planning, which also focuses on specialized planning functions of various public agencies.

630 Local Economic Policy—Seminar  Fall. 4 credits. P. Clavel. The politics and administration of economic development programs. Theory case studies and policy issues treating the evolution of local development efforts in the transition from the high-growth post–World War II economy to contemporary and classic situations of regional decline.

631 Local Economic Policy—Field Workshop  Spring. 4 credits. P. Clavel. A group policy analysis exercise in an upstate New York city. Students do a combination of data analysis, interviews with labor, business, and public leaders; and problem papers addressed to current issues presented by a client group. Individual work is synthesized into a comprehensive report at the end of the semester.

730 Methods of Regional Science  Fall. 4 credits. Prerequisite: basic economics and elementary matrix algebra. Not offered 1986–87. R 10:10–12:05, plus optional workshops. S. Czarnanski. The course covers main quantitative techniques used in city and regional planning. Emphasis is placed on formulation of models and derivation of testable hypotheses. Examples and applications to regional planning are discussed.

731 Optimization Techniques in Planning  Fall. 4 credits. Prerequisites: basic economics, elementary calculus, and matrix algebra.

732 Regional Industrial Development  Fall. 4 credits. Prerequisites: basic economics and elementary calculus.

738 Fieldwork or Workshop in Regional Development Planning  Fall or spring. Variable credit. Staff. Work on applied problems in regional development planning in a field or a laboratory setting or both.

739 Special Topics in Regional Development Planning  Fall or spring. Variable credit. Staff.

839 Informal Study in Regional Development Planning  Fall or spring. Variable credit. Staff.

Social-Policy Planning

540 Introduction to Social-Policy Planning  Fall. 4 credits. Not offered 1986–87. Staff. The process and politics of providing public services, primarily social services, within the context of changing fiscal and social conditions. Topics include (1) a review of the nature and scope of selected social problems and of the present service systems that attempt to meet these needs; (2) an analysis of the inadequacies and problems of this system in the light of changing conditions that affect service delivery, such as fiscal and service disparities, budget retrenchment, and political movements to limit spending, such as Proposition 13; and (3) an exploration of new forms or alternatives to the existing service delivery systems.

541 The Politics of Technical Decisions I (also Government 628 and Sociology 515)  Fall. 4 credits. Prerequisites: Program on Science, Technology, and Society. Not offered 1986–87. W 2:30–4:25. D. Nelkin. Political aspects of decision making in technical areas. Drawing from recent risk disputes, we will examine the origins and characteristics of "technical politics," the role of experts in government, and the problem of expertise in a democratic system. Alternatives to current decision-making procedures are explored.

542 The Politics of Technical Decisions II (also Government 629)  Spring. 4 credits. Prerequisite: CRP 541 or permission of instructors. Cosponsored by the Program on Science, Technology, and Society. W 2:30–4:25. D. Nelkin. A continuation of CRP and Regional Planning 541, focusing on political aspects of decision making in technical areas. Drawing from recent risk disputes, we will examine the origins and characteristics of "technical politics," the role of experts in government, and the problem of expertise in a democratic system.

543 Planning, Organizing, and Public Service Delivery  Fall or spring. Variable credit. R 10:10–12:05. J. Forester. An exploration of planners' roles with special attention to organizational and political contexts of planning and policy analysis. Emphasis is on communicative dimensions of organizational behavior and planning practice; planning is assessed as an organizing activity extending far beyond technical problem solving.

544 Dynamics of Social-Policy Institutions  Spring. Variable credit. J. Forester. Recurring social policy themes are studied: professional power and creation of dependency, political and technical aspects of expertise, organizational and institutional settings of social policy programs and services, problems of professional altruism in service delivery.

545 Introduction to Public Policy Analysis and Management  Fall or spring. 3 credits. Staff. Social-Policy Planning. Introduction to systematic methods and processes for analyzing issues and problems of public policy and management. Roles of economic analysis and of analytic techniques in public policy decision making will be reviewed, and their respective strengths and weaknesses evaluated. Applications to a variety of public sector problem areas will be explored.

642 Critical Theory and the Foundation of Planning Analysis  Fall. Variable credit. R 10:10–12:05. J. Forester. Problems of social action are studied in the traditions following Marx, Weber, and Durkheim. Analyses of reproduction and resistance, normative order and power, meaning systems, and organizational action provide the bases for a consideration of Habermas's synthetic critical communications theory of society. Implications for planning practice, education, and research are drawn.

843 Legal Aspects of Public Administration  Fall. 3 credits. M W F 11: 5 R. Booth. Examination of basic legal issues that commonly arise in the administrative agencies, including, for example, agency rule making, protection of individual rights in administrative processes, and judicial review of agency decisions. The course is designed for persons interested in professional careers that will involve working in or with public agencies.

645 Planning and Policy Economics  Fall or spring. 3 credits. S. Saltzman. An introduction to microeconomic principles useful in analyzing public sector problems and in choosing among alternative solutions. Applied aspects of welfare
740 Seminar in Social-Policy Research and Analysis
Spring. 4 credits.
Staff.
Focuses on examining contemporary methods of social policy analysis, including their political implications, and developing multidisciplinary approaches to selected social policy issues. The dilemmas of action research and of implementing research findings are explored.

743 The Critical Theory of Jurgen Habermas
Spring. 4 credits. Prerequisite: background in political or social theory
This seminar explores the critical theory of Jurgen Habermas, particularly its application to problems of planning and public policy analysis. We consider problems of legitimation, power, rationalization, instrumental and communicative action, ideology, and systematically distorted communications as they appear more broadly in the practice of planners, policy analysts, or professionals.

746 Informal Seminar in Planning Theory: Philosophy, Ethics, and Values in Planning
Fall or spring. Variable credit.
J. Forester.
An informal seminar to discuss problems of values, ethics, and alternative philosophical positions that are inherent in various planning proposals or perspectives. The claims of incrementalists to the contrary, can planning be ethical? Must value judgments be arbitrary?

748 Fieldwork or Workshop in Social-Policy Planning
Fall or spring. Variable credit.
Staff.
Work on applied problems in social-policy planning in a field or laboratory setting or both.

749 Special Topics in Social-Policy Planning
Fall or spring. Variable credit.
Staff.

Land Use and Urban Development Planning

552 Urban Land-Use Planning I
Spring. 3 credits.
M 12:20. S. Stein.
Surveys, analyses, and plan-making techniques for guiding physical development of urban areas; location requirements, space needs, relationships of land uses. Emphasis on residential, commercial, and industrial activities and community facilities; housing and neighborhood conditions. Lectures, seminars, and field exercises.

553 Urban Land-Use Planning II
Fall. 3 credits.
Prerequisite: CRP 552 or permission of instructor.
Staff.
In-depth consideration of special issues in urban land-use planning, such as industrial districts, large-scale integrated development, Planned Unit Development, public and institutional facilities, open space, land banking, central business districts, neighborhoods, energy impacts, transportation impacts, and others.

554 Introduction to Planning Design
Fall. 3 credits.
M 12:20. S. Stein.
Lectures, seminars, readings, and design exercises explore basic concepts and issues related to urban planning, site planning, and environmental awareness. Emphasis is on professional practice. Intended for students without design backgrounds, but others may enroll.

555 Planning Design Workshop
Spring. 2 or 4 credits. No previous graphics or design experience required.
S. Stein.
A studio course focusing on planning design problems related to the built environment. An understanding of the design process is developed, and graphic communication techniques are explored.

556 Built-Environment Education Workshop
Spring. 4 credits.
Fieldwork hours to be arranged. Organizational meeting 12:20 first F of classes. S. Stein.
Interdisciplinary teams of students from planning, architecture, landscape architecture, historic preservation, and other environmental design disciplines work in classrooms with school children and teachers to deepen their understanding of the built environment and to encourage their participation in the shaping of their own environment. Work in local schools is emphasized.

557 Small-Town Community Design Workshop
Fall or spring. 2 or 4 credits.
Fieldwork hours to be arranged. Organizational meeting 10:10 first W of classes. S. Stein.
An in-depth approach to specific problems facing the small town or small city. Various aspects of planning, historic preservation, landscape architecture, and design, including "Main Street" revitalization, streetscape planning, storefront rehabilitation, signage, and comprehensive planning, are explored in a workshop setting. Working with real clients in nearby communities.

651 Urban Land Policy and Programs
Fall. 3 credits.
Prerequisite: CRP 553 or permission of instructor. Not offered 1986–87.
Major problems of urban land control and management, and possible solutions are considered. Subjects for discussion include taxation, compensation and betterment, large-scale public land acquisition, subsidies and incentives, and acquisition of developmental rights.

652 The Urban Development Process
Fall. 2 credits. Enrollment limited.
R. T. Stewart.
Examination of the goals, strategies, methods, and achievements of major participants in the urban land and building market: land owners, speculators, real estate brokers, developers, bankers, lawyers, nonprofit builders, and government agencies. Primarily visiting speakers.

653 Legal Aspects of Land-Use Planning
Spring. 3 credits.
Prerequisite: CRP 511 or permission of instructor.
Survey of leading cases and legal concepts in land-use planning, with particular attention to zoning, subdivision control, condemnation, and growth-control issues.

654 Real Estate Development I: Advanced Analysis and Critique
Fall. 4 credits.
Prerequisite: Hotel Administration 300 or equivalent. Limited to 20 students with permission of instructor.
Staff.
The course will investigate many aspects of real estate development from a pragmatic point of view. Areas covered will include acquisition, finance, valuation, construction, design and marketing, and the interplay of these variables.

655 Real Estate Development II: Advanced Analysis and Critique
Spring. 4 credits.
Prerequisite: CRP 654 or equivalent. Limited to 20 students with permission of instructor.
Staff.
A continuation of City and Regional Planning 654.

566 Land Resources Protection Law
Fall. 3 credits.
M 11:00–1:00. R. Booth.
Examines legal issues raised by government efforts to protect critical land resources such as tidal wetlands, flood plains, forests and agricultural lands, and large resource areas such as the coastal zone. Students will utilize a broad selection of legal materials and learn to use the basic resources of a law library.

750 Urban Land Policy and Programs—Special Problems
Fall or spring. Variable credit.
Staff.
Work on applied problems in urban development planning in a field or laboratory setting or both.

759 Special Topics in Urban Development Planning
Fall or spring. Variable credit.
Staff.

Special Intergovernmental Coordination Topics: History and Historic Preservation

560 Documentation for Preservation (also Architecture 586)
Fall. 3 credits.
Methods of identifying, recording, collecting, processing, and analyzing information dealing with historic and architecturally significant structures, sites, and objects.

561 Historic Preservation Planning Workshop: Surveys and Analyses (also Architecture 588)
Fall or spring. 4 credits.
T 10:00–12:00. 30: Staff.
Techniques for the preparation of surveys of historic structures and districts; identification of American architectural styles, focusing on upstate New York; explorations of local historical resources, funding sources, and organizational structures. Lectures and training sessions. Emphasis on fieldwork with individuals and community organizations.

562 Perspectives on Preservation (also Architecture 585)
Fall. 3 credits.
Introductory course for preservationists. A survey of the historical development of preservation activity in Europe and America, leading to a contemporary comparative overview. Field trips to notable sites and districts.

563 Problems in Contemporary Preservation Practice (also Architecture 584)
Spring. Variable credit.
M. A. Tomlan.
A review and critique of ongoing preservation projects and an investigation of areas of expertise currently being developed, presented by staff and guest lecturers.

564 Building Materials Conservation (also Architecture 587)
Spring. 3 credits.
Open to juniors, seniors, and graduate students.
M. A. Tomlan.
A survey of the development of building materials in the United States, chiefly during the nineteenth and early twentieth centuries, and a review of the measures that might be taken to conserve them.

565 American Planning in the Early Twentieth Century
Fall. 3 credits. Prerequisite: introductory course in American architectural or planning history.
W 11:00–1:00. J. W. Reps.
Urban and regional plans, planners, and planning during the period between the Senate Park
662 Seminar in American Urban History (also CRP 361) Spring. 3 credits. Prerequisite: permission of instructor.

J. W. Reps.

A seminar in which each student selects a topic for oral presentation followed by the completion of a research paper. Each student will produce a research paper on an aspect of the subject, using library resources at Cornell and elsewhere.

663 Historic Preservation Law Spring. 3 credits. Offered alternate years.

M 9:00. R. Booth.

Law of historic district and landmark designation; tools for preservation (such as police power, taxation, eminent domain); recent developments in state and federal historic preservation mandates.

664 Economics and Financing of Neighborhood Conservation and Preservation Fall. 3 credits.

B. G. Jones.

The economic and financial aspects of historic preservation and neighborhood conservation. Topics include public finance, selected issues in urban economics, real estate economics, and private financing of real estate projects.

665 Preservation Planning and Urban Change Fall. 3 credits.

I. R. Stewart.

An examination of fundamental planning concepts and issues as they relate to historic preservation. Neighborhood revitalization, federal housing programs, the role of public and private institutions, displacement, and other social issues are among the primary topics.

768 Fieldwork or Workshop in History and Preservation Fall or spring. Variable credit.

Staff.

Work on applied problems in history and preservation planning in a field or laboratory setting or both.

769 Special Topics in History and Preservation Fall or spring. Variable credit.

Staff.

Informal Study in History and Preservation Fall or spring. Variable credit.

Staff.

Special Interprogram Topics: International Studies

570 Seminar in Latin American Urban Planning and Development Fall or spring. 2 credits. Not offered 1986–87.

S. Stein and guest lecturers.

Seminars covering the urban planning and development problems facing Latin American cities. Historical development; current and future physical, social, economic, and administrative issues focusing on urban areas, with consideration of their regional context. Coordinated with City and Regional Planning 571.

571 Workshop in Latin American Urban Planning and Development Fall or spring. 4 credits. Not offered 1986–87.

S. Stein.

Application of planning theories and methodologies to problems of Latin American cities. Selection of specific urban planning projects for survey, analysis, policy formulation, plan preparation, and program development. Students work in teams or individually in a workshop–studio setting.

572 Introduction to Microcomputer Applications for Planning and Program Management in Developing Countries 3 credits. Fall or spring.

Prerequisite: Seminar participants should be familiar with the use of microcomputers.

D. Lewis.

The rapidly expanding use of microcomputers for planning and program management in developing countries is examined. Advantages and disadvantages are studied for several different applications and from several different points of view. Case study materials are reviewed in an analysis of how microcomputer-based information systems are designed, established, and used. Alternative scenarios for future utilization are explored. Students are expected to do a project in which they design a program for introducing microcomputers into a specific planning or program management context in a developing country.

670 Regional Planning and Development in Developing Nations Fall. 4 credits. Prerequisite: second-year graduate standing.

T. S. S. W. W. Goldsmith.

Extensive case studies of development planning are analyzed. Focus is on a Marxist critique of the process of regional development through urbanization, and in particular on the concepts of equity and efficiency, external economies, export linkages, and internal self-sufficiency and integration. Resource development, national integration, human development, and migration problems are discussed.

671 Seminar in International Planning Spring. 1 credit. S-U grades only.

F. 12:20–1:30. Staff.

The international planning lecture series sponsors lectures by visiting scholars or professionals in the field of international development and planning. The only formal requirement for the course is a brief evaluation of the series at the end of the semester.

771 Seminar in Science and Technology Policy in Developing Nations Spring. 3 credits.

D. Lewis.

An exploration of the issues facing developing countries as they endeavor to use technology in pursuit of their national goals. Topics include alternative choices of technology and the associated impacts, the role of multinational corporations, government policy-making institutions, manpower development and utilization strategies, and policy instruments.

772 Seminar in Policy Planning in Developing Nations: Technology Transfer and Adaptation Fall. 3 credits.

F. 10:10–12:05. D. Lewis.

An exploration of the international transfer of technology to developing nations and the policies used to guide this process. Topics covered include the role of foreign aid and multinational corporations, economic rationale for choice of appropriate technology, and social benefit-cost analysis. Case studies are emphasized.

773 Seminar in Project Planning in Developing Countries Fall or spring. 3 credits.

P. Opadwala.

An examination of the problems and issues involved in the process of planning and implementing development projects in developing countries. The role of the planner is explored from several different disciplinary points of view through a series of case studies selected from agriculture, industry, rural development, and urban planning. Countries typically represented include Egypt, Ethiopia, India, Jordan, Korea, Mexico, Nepal, and the Commonwealth of Puerto Rico.

774 Science, Technology, and Development Fall. 3 credits.

P. Opadwala.

The place and role of science and technology as a factor in socioeconomic growth is examined with special reference to developing regions. The social underpinnings and history of science and technology are studied and their role explored as a nonneutral and dynamic social force that primarily serves the ends of particular groups in societies. Current issues such as technological development, technology transfer, and appropriateness of technology are discussed in this context, with attention given to both rural and industrial development. Third World science and technology policy-planning options are considered throughout the course.

775 Transnational Corporations and Developing Regions Spring. 3 credits.

P. Opadwala.

Transnational corporations are studied in the context of socioeconomic development. Contending theories of the international firm are examined as a starting point for evaluating contradictory claims and counterclaims of proponents and detractors of transnational corporations. Advantages and disadvantages for developing regions are considered and Third World planning and policy options discussed on an ongoing basis.

776 Seminar in Urban Policy and Planning in Developing Countries Fall or spring. 3 credits.

K. C. Parsons.

A Cornell-in—Washington course.
The national urban development policy and planning efforts of selected developing countries are examined in the context of urbanization theory and national spatial planning. Recent descriptive and critical literature is explored. Topics include secondary cities policies, national and urban transportation planning, city planning, sites and services project planning, housing, land policy, and urban development control systems.

777 Theories of Development and Under-development  Spring. 3 credits.
  P Oladwala.
Various theories attempting to analyze and explain the phenomena of underdevelopment are examined. Although a range of thought and approaches are considered, the accent is on aspects of political economy revolving around concepts of class and exploitation. Topics include the transition to capitalism, dependent and uneven development, various issues of growth and fluctuation under contemporary capitalism, including crises; rural and industrial development in less-developed countries, and planning for development.

778 Fieldwork or Workshop in Planning for Developing Regions  Fall or spring. Variable credit.
  Staff.
Work on applied problems in planning for developing regions in a field or laboratory setting or both.

779 Special Topics in Planning for Developing Regions  Fall or spring. Variable credit.

878 Advanced Fieldwork or Workshop in Planning for Developing Regions  Fall or spring. Variable credit.
  Staff.
Work on applied problems in planning for developing regions in a field or laboratory setting or both.

879 Informal Study in Planning for Developing Regions  Fall or spring. Variable credit.
  Staff.

Special Interprogram Topics: Environmental Health, Housing, and Institutional Planning

585 Introduction to Environmental Health Issues  Spring. 3 credits. Not offered 1986–87.
An examination of concepts and issues in environmental health, particularly as they relate to planning for health and medical care delivery systems, economic development, and other policy issues.

687 Environmental Management Workshop  Spring. 3 credits.
  M W. R. Booth.
Research and analysis of environmental management topics of current interest at the state or local government level. Fieldwork is emphasized; students produce reports or recommendations, or draft legislation that contributes to solving current issues.

  Lectures, reading, and fieldwork, and theoretical and practical materials are combined to develop operating skills in health planning. The critical focus is on (1) the social determinants of illness, (2) the engineering model of medicine, (3) the commodity form of medical care, and (4) the prevailing economic definition of health. These topics together comprise the social context in which health planning takes place. After an intensive institutional introduction to health planning, legislation, organizations, and practices, participants in the course work in one of four health planning research projects conducted in the surrounding area. Contact with local and regional organizations in and out of health planning is included.

*Offered through the College of Agricultural and Life Sciences.

785 Planning and Evaluation of Environmental Health Programs and Projects  Spring. 3 credits.
  Prerequisite: second-year graduate standing. Not offered 1986–87.
  T R 9:05. Staff.
An examination of the use of quantitative methods and economic analysis as aids to social decision making for action in the area of environmental health. Applications of these methods to the study of particular problems of environmental health.

786 Environmental Health Planning  Fall. 2 credits.
  Prerequisite: second-year graduate standing. Not offered 1986–87.
  M W 10:10. Staff.
Introduction to concepts and issues in environmental health planning. Topics covered include the planning problems involved in the control of water quality, liquid and solid waste disposal, and air quality.

787 Health Systems Planning  Fall. 3 credits. Not offered 1986–87.
  R 9:05. Staff and guest lecturers.
Issues, institutions, politics, economics, and social elements involved in the planning and administration of health problems. Special emphasis is on planning techniques and methodologies.

788 Fieldwork or Workshop in City and Regional Planning  Fall or spring. Variable credit.
  Staff.
Work on applied planning problems in a field or laboratory setting or both.

789 Special Topics in City and Regional Planning  Fall or spring. Variable credit.
  Staff.

886 Informal Studies in Environmental Health Planning  Fall or spring. Variable credit.
  Staff.

Advancement Courses and Seminars

Advanced seminars are primarily for graduate students, but with the permission of the instructor they may be taken by qualified undergraduates. The selection of seminars to be offered each term is determined by the needs of the students.

790 Professional Planning Colloquium I  Fall. 1 credit.
  W 4:30–5:30. Staff.

791 Professional Planning Colloquium II  Spring. 1 credit.
  W 4:30–5:30. Staff.

792 Master's Thesis, Project, or Research Paper I  Fall. 1–10 credits.
  Staff.

  Staff.

794 Planning Internships  Fall, spring, or summer. 1–12 credits.
  Staff.
Combines a professional planning internship in a metropolitan area with academic study in order to provide experience and understanding of the planner's role in formulating and implementing plans and policies. Salaried internships in federal or state agencies, legislative offices, and comparable settings include development of research, analysis, and other technical skills. Weekly seminars draw on student field experiences, assigned readings, and guest speakers to examine current issues of federal, urban, and regional policy from the perspective of planning practice.

*100 Landscape Architecture Freshman Orientation  Fall. 1 credit.
  M. I. Adelman.

140 Landscape Design Studio  Spring. 4 credits.
Limited to approximately 15 students; primarily for nonmajors and freshman landscape architecture students. Prerequisite: permission of instructor. Lab fee, $20.
Fundamentals of landscape design applied to residential and other small-scale site-planning projects. Work in the studio introduces design process, site design principles, construction materials, planning design, and graphics.

*201 Theory and Application Studio  Fall. 6 credits.
  M. I. Adelman.

*202 Project Design and Site Planning Studio  Spring. 6 credits.
  T. H. Johnson.

*205 Graphic Communication I  Fall. 3 credits.
  T. H. Johnson.

Landscape Architecture

The Landscape Architecture Program at Cornell is jointly sponsored by the College of Agriculture and Life Sciences (in association with the Department of Floriculture and Ornamental Horticulture) and the College of Architecture, Art, and Planning.

The Program


The Landscape Architecture Program offers three professional degree alternatives: a two-year graduate curriculum directed to those who have undergraduate degrees in landscape architecture or architecture, a three-year graduate curriculum directed to those who have undergraduate degrees in other fields, and a four-year undergraduate curriculum. Graduate studies in landscape architecture are administered through the Graduate School and lead to a Master of Landscape Architecture degree. Undergraduate studies in landscape architecture are administered through the College of Agriculture and Life Sciences and lead to a Bachelor of Science degree.

Course Information
*220 Principles of Spatial Design Fall. 3 credits.
R. T. Trancik.

301 Natural Systems Studio Fall. 6 credits.
Prerequisite: LA 202 with a grade of C or better. Lab fee $20; cost of drafting supplies, about $100; expenses for field trip, about $200.
Lecs, M W F 1:25; studios, M W F 2:30–4:25.
L. Mirin.
The application of landscape analysis and techniques at a regional scale. Students examine the management of landscape organizations within physiographic and/or politically defined areas using state-of-the-art methodologies.

302 Urban Systems Studio Spring. 6 credits.
Prerequisite: LA 301 with a grade of C or better. Lab fee, $20; cost of drafting supplies, about $100.
Lecs, M W F 1:25; studios, M W F 2:30–4:25.
L. Mirin.
Projects in landscape architecture at the site scale as determined by constraints and opportunities of an urban environment. Focus on integration of site and historical analysis in formulation of physical design solutions.

*310 Site Construction I Spring. 4 credits.
P. J. Trowbridge.

*312 Site Construction II Spring. 4 credits.
M. I. Adleman.

400 Professional Practice Fall. 2 credits.
Prerequisite: concurrent registration in LA 401.
Examination of the landscape architectural profession, including office practices and organization, client–practitioner relationships, and documentation for project proposals and job specifications. Class format includes guest lectures and field trips.

*401 Advanced Project Design and Graphics Studio Fall. 6 credits.
R. T. Trancik.

*402 Senior Project Studio Spring. 6 credits.
M. I. Adleman.

490 Special Topics in Landscape Architecture Fall or spring. 1–3 credits; may be repeated for credit. S-U grades optional.
Staff.
Topical subjects in landscape architectural design, theory, history, or technology. Group study of topics not considered in other courses.

497 Independent Study in Landscape Architecture Fall or spring. 1–5 credits, may be repeated for credit. S-U grades optional.
Staff.
Work on special topics by individuals or small groups.

500 Graduate Orientation Seminar Fall. 1 credit.
S-U grades only.
Presentation and discussion of work of Cornell faculty members in and related to the Field of Landscape Architecture.

501 Theory and Application Studio Fall. 6 credits.
Lab fee $50; cost of basic drafting equipment and supplies, about $200; expenses for field trip, about $200.
Lecs, M W F 1:25; studios, M W F 2:30–4:25.
Required 5-day field trip. L. Mirin.
Introduction to basic concepts of site analysis and physical design of landscape. Exercises and projects explore the relationship between natural features, functional demands, professional traditions, and the creation of spatial form.

*502 Project Design and Site Planning Studio Spring. 6 credits. Limited to graduate students. Cost of drafting supplies, about $100.
Lecs, M W F 1:25; studios, M W F 2:30–4:25.
D. W. Krall.
The studio will focus on the spatial design of project-scale site development. Students will develop their expertise in applying the design theory, vocabulary, and graphic expression introduced in LA 501.

520 Contemporary Issues in Landscape Architecture Fall. 2 credits. S-U grades only.
Lec, F 11:15–1:10. L. Mirin.
Presentations on topics that are current and significant to the environmental design and planning fields. Issues are discussed from a landscape architecture point of view by practitioners and researchers representing a range of professions.

521 History of Landscape Architecture I Fall. 3 credits.
Lecs, T R 11:15; disca to be arranged. L. Mirin.
A survey from classical times to the present, emphasizing design principles and techniques that have established the landscape architecture tradition in Europe. Particular reference is made to the manner in which environments such as gardens, streets, plazas, parks, and new towns reflect in their built form a range of response to demands of culture, economics, technology, security, the law, and ecology.

522 History of Landscape Architecture II Fall. 3 credits.
Lecs, T R 11:15; disca to be arranged. L. Mirin.
Landscape architecture in the United States from Jefferson to the present is examined as a unique expression of the American experience. Influences exerted by the physical landscape, the frontier and utopian spirit, and the cultural assumptions of democracy and capitalism are traced as they affect the forms of urban parks, private and corporate estates, public housing, transportation planning, national parks, and other open-space designs.

Lec, disc, and field trips to be arranged. L. Mirin.
The principles and techniques of landscape architectural development and conservation of urban open space. Areas studied include the urban landscape tradition, urban arboriculture, streets and strollways, design controls and public space, recreation, and housing.

*531 Regional Landscape Planning I Fall. 4 credits.
A. S. Lieberman.

*532 Regional Landscape Planning II Spring. 3 credits.
A. S. Lieberman.

601 Natural Systems Studio Fall. 6 credits.
P. J. Trowbridge.

602 Urban Systems Studio Spring. 6 credits.
R. T. Trancik.

*605 Independent Study in Landscape Ecology and Regional Planning Spring. 1–3 credits.
A. S. Lieberman.

*701 Advanced Project Design Studio Fall. 6 credits.
T. H. Johnson.

800 Master's Thesis in Landscape Architecture Fall or spring. 9 credits.
Hours to be arranged. Staff.
Independent research under faculty guidance, leading to the development of a comprehensive and defensible design or study related to the field of landscape architecture. Work is expected to be completed in the final semester of residency.

Faculty Roster

Axley, James W., Ph. D., U. of California at Berkeley.
Assoc. Prof., Architecture

Banerja, Lourdes, Ph. D., Columbia U. Prof., City and Regional Planning

Bertoia, Roberto, M. F. A., Southern Illinois U. Asst. Prof., Art

Burn, Zevi, B. Arch., Cornell U. Assoc. Prof., Art

Cappel, Richard S., J. D., George Washington U. Assoc. Prof., City and Regional Planning

Bowman, Stanley J., M. F. A., U. of New Mexico. Assoc. Prof., Art

Cleave, Pierre, Ph. D., Cornell U. Prof., City and Regional Planning

Cohen, Michael, M. S., Cornell U., Asst. Prof., Architecture

Colby, Victor E., M. F. A., Cornell U. Prof. Emeritus, Art

Cole, James, M. F. A., Cornell U. Asst. Prof., Art

Colker, Ed, M. A., New York U. Prof., Art

Crump, Ralph W., B. Arch., Cornell U. Prof. Emeritus, Architecture

Czamanski, Stan, Ph. D., U. of Pennsylvania. Prof., City and Regional Planning

Daly, Norman, M. A., Ohio State U. Prof. Emeritus, Art

Evett, Kenneth W. M., Colorado Col. Prof. Emeritus, Art

Forester, John, Ph. D., U. of California at Berkeley.
Assoc. Prof., City and Regional Planning


Goldsmith, William W., Ph. D., Cornell U. Prof., City and Regional Planning

Greenberg, Donald P., Ph. D., Cornell U. Prof., Architecture

Hascup, George E., B. Arch., U. of California at Berkeley.
Assoc. Prof., Architecture

Hodgden, Lee F., M. Arch., Massachusetts Inst. of Technology Assoc. Prof

Jones, Barclay G., Ph. D., U. of North Carolina. Prof., City and Regional Planning

Kelly, Bunnham, M. C. P., Massachusetts Inst. of Technology Prof. Emeritus, City and Regional Planning

Kira, Alexander, M. R. P., Cornell U. Prof., Architecture


Kubelik, Martin, Dr.lng., Rheinisch-Westfälische Technische Hochschule (Germany). Assoc. Prof.

Lax, David B., Ph. D., Cornell U. Prof., City and Regional Planning

Loczy, Jean N., M. F. A., Ohio U. Asst. Prof., Art

MacDougall, Bonnie G., Ph. D., Cornell U. Asst. Prof., Architecture

MacDougall, Robert D., Ph. D., Cornell U. Asst. Prof., Architecture

Mackenzie, Archie B., M. Arch., U. of California at Berkeley Assoc. Prof., Architecture


Mikus, Eleanore, M. A., U. of Denver Assoc. Prof., Art

Miller, John C., M. Arch., Cornell U. Assoc. Prof., Architecture

*Offered through the College of Agricultural and Life Sciences.


Nelkin, Dorothy W., B.A., Cornell U. Prof., City and Regional Planning/Program on Science, Technology, and Society/Sociology

Opadwala, Paras, Ph.D., Cornell U. Assoc. Prof., City and Regional Planning

Ostlund, John F., M.Arch., Harvard U. Asst. Prof., Architecture

Otto, Christian F., Ph.D., Columbia U. Prof., Architecture


Parsons, Kermit C., M.R.P, Cornell U. Prof., City and Regional Planning

Pearman, Charles W., B.Arch., U. of Michigan. Prof., Architecture

Peterson, Tom F., D.Sc. (Techn.) and Diploma, Swiss Federal Inst. of Technology, Zurich. Assoc. Prof., Architecture

Poleske, Stephen F. B.S., Wilkes Coll. Prof., Art

Pepes, John W., M.R.P, Cornell U. Prof., City and Regional Planning


Saltzman, Sid, Ph.D., Cornell U. Prof., City and Regional Planning

Saul, Francis W., M.S., Harvard U. Assoc. Prof. Emeritus, Architecture

Schack, Mario L., M.Arch., Harvard U. Prof., Architecture

Shaw, John P., M.Arch., Massachusetts Inst. of Technology Prof., Architecture

Singer, Arnold, Prof., Art

Squier, Jack L., M.F.A., Cornell U. Prof., Art

Stein, Stuart W., M.C.P, Massachusetts Inst. of Technology Prof., City and Regional Planning

Stewart, Ian R., Ph.D., Cornell U. Assoc. Prof., City and Regional Planning

Tomlin, Michael A., Ph.D., Cornell U. Asst. Prof., City and Regional Planning

Ungers, O. Mathias, Diploma, Technical U. Karlsruhe (Germany). Prof., Architecture

Vietorisz, Thomas, Ph.D., Massachusetts Inst. of Technology Adjunct Prof., City and Regional Planning

Warke, Val K., M.Arch., Harvard U. Assoc. Prof., Architecture

Wells, Jerry A., B.Arch., U. of Texas. Nathaniel and Margaret Owings Distinguished Alumni Professor of Architecture, Architecture

Woods, Mary N., Ph.D., Columbia U. Asst. Prof., Architecture

Zissis, John, M.Arch., Cornell U. Assoc. Prof., Architecture
Freshman Seminars
Each semester of their freshman year in the college, students choose a Freshman Seminar from among more than 90 courses offered by over 25 different departments in the humanities, social sciences, and expressive arts. These courses all share one major purpose: to develop skill in writing English prose. They also ensure that all beginning students may have the benefits afforded by a small class.

Language Requirement
The faculty consider some competence in a foreign language essential for an educated person. Studying another language helps students understand language itself, our fundamental intellectual tool, and opens another culture for exploration. The sooner the student acquires competence, the more useful it will be. Hence work toward the foreign language requirement should be undertaken in the freshman and sophomore years. The following departments teach foreign languages or literature or both in the College of Arts and Sciences: African, Asian, Classics, German, Modern Languages and Linguistics, Near Eastern Studies, Romance Studies, and Russian Literature.

The language requirement may be satisfied in one of two ways:
1) by attaining proficiency in one language or
2) by attaining qualification in two languages.

Proficiency
Proficiency is attained by passing a 200-level course (or Chinese or Japanese 161) or by equivalent achievement, to be determined by examination, see below under "Advanced Standing Credit." Qualification
Qualification may be attained in any of the following four ways:
1) Three years of high school study in any one language gives qualification in that language. Note, however, that this route to qualification does not guarantee entrance into a 200-level course. The student who wants to continue in this language must be placed by examination.
2) Passing the requisite course: 102, 123, or 134 in languages taught by the Department of Modern Languages and Linguistics; Chinese or Japanese 160, Near Eastern Studies 102 or 122 in Hebrew, 112 in elementary classical Arabic, or 214 in Egyptian Arabic; Classics 103 in Greek; Classics 106 or 108 in Latin.
3) A score of 560 or better on the College Placement Test (CPT).

Place in Placement in a 200-level course by special examination (in cases where no CPT is available). A student may submit a 560 CPT score at the end of a course numbered 122, thus attaining qualification without taking 123. This procedure is optional; the student with a score of 560 or better may want to take 123 in order to be better prepared for the 200-level courses.

Speakers of languages other than English may be awarded credit for their bilingual ability. Their English achievement is measured by the Test of English as a Foreign Language (TOEFL), a requirement for matriculation; their performance in one other language learned outside the academic environment is measured by examination, and evidence for abilities in reading and writing, as well as speaking, is required. A maximum of 6 advanced placement credits are granted to students who demonstrate proficiency equivalent to course work at the 200 level or above at Cornell. Students may not earn credit both for proficiency in their native language and for studying English as a second language at Cornell.

Language Course Placement and Credit
Students who have had two or more years of high school study in a language may not register in any course in that language without being placed by examination. Nor can transfer students register without examination, even though they may have been given credit for language work elsewhere. The type of examination depends upon the language course and the level of achievement:

1) French, German, Italian, Latin 105, Russian, and Spanish courses: CPT. Entering students who have not taken the CPT in high school and who want to continue their language study must take the CPT at Cornell during orientation week. Students may retake this examination at Cornell if they have studied the language a year or more since last taking the test. In order to do this, students register with the Academic and Career Counseling Services, 203 Barnes Hall, and pay a fee of $5.
2) Latin (all courses except 105): departmental examination.
3) Arabic: departmental examination.
4) Hebrew: departmental examination.
5) Other languages: special examinations; see the professor in charge.
6) High achievement (students with a CPT score of 650 or better in French, German, Hebrew, Italian, Russian, and Spanish): the Cornell Advanced Standing Examination (CASE).

An entering or continuing student with high achievement scores should take the Cornell Advanced Standing Examination (CASE), even if the student does not want to do any further work in the language, the CASE may provide proficiency status for the language requirement, and it may provide up to 6 hours of advanced standing credit. Students who do not have high achievement scores are eligible for the courses listed in the charts below, depending on their scores. For other languages, or for special problems, students should see the professor in charge.

French
CPT
Reading Score
Language Courses
Literature Courses
Below 450 121
450—559 123
560—649 203
650 and above Apply for the Cornell Advanced Standing Examination (CASE)

German
CPT
Reading Score
Language Courses
Literature Courses
Below 450 121
450—559 123
560—649 203
650 and above Apply for the Cornell Advanced Standing Examination (CASE)

Italian
CPT
Reading Score
Language Courses
Literature Courses
Below 450 121
450—559 123
560—649 203
650 and above Apply for the Cornell Advanced Standing Examination (CASE)

Russian
CPT
Reading Score
Language Courses
Literature Courses
Below 450 101
450—559 121
560—649 123
650 and above Apply for the Cornell Advanced Standing Examination (CASE)

Program of Study
The College of Arts and Sciences at Cornell is a traditional liberal arts college. It is composed of those departments that teach and study the humanities, the basic sciences, mathematics, the social sciences, and the expressive arts. It is also a college within a university, and this wider community provides strength and diversity not available in an isolated undergraduate institution. Students may draw upon the knowledge and facilities of the other undergraduate colleges at Cornell to supplement their studies. Finally, the college is a graduate school and research center attracting faculty whose active involvement in writing and research requires first-rate academic facilities and whose energetic participation in undergraduate teaching brings to their students the most current ideas in modern scholarship. It is this abundant variety that gives the college its distinctive character.

The richness of the curriculum is extraordinary; there is no course that all students must take, and there are several hundred from which they may choose. By choosing courses each semester, students design their own education. They strike a balance between developing known interests and exploring new subjects. They sharpen their verbal and quantitative skills. They also come to understand more thoroughly our common Western tradition and learn something about the non-Western world and its peoples. An education in the liberal arts means honing one's critical capacities, learning more about oneself in nature and culture, and gaining real experience of views of the world radically unlike one's own. All this is highly individual, and the college relies on each student and faculty advisor to select sensible, challenging, and appropriate courses.

Yet the faculty believe that each student's education should have certain common qualities. These include familiarity with several different ways of knowing that are reflected in the natural sciences, in the social sciences, and in those achievements of intellect and imagination that are the focus of the humanities and the expressive arts. In addition to these general areas of knowledge, students study foreign languages, acquire effective writing skills, and concentrate on one particular field to develop, as fully as possible, the powers of imaginative and critical thinking. To accomplish these objectives, the college has certain requirements for graduation.

Summary of Basic College Requirements for Graduation
1) Freshman Seminar: Two courses
2) Foreign language: Qualification in two languages or proficiency in one.
3) Distribution: An approved sequence of 2 full-semester courses (6–8 credits) in either subdivision of four groups.
4) Major
5) Electives: Four or five courses (or 15 credits) in courses not used to fulfill other requirements and not in the major field.
6) Residence: Eight full-time semesters, unless a student can successfully complete the other requirements in the eight semesters and is allowed to accelerate graduation. See the section "Residence."
7) Minimum number of courses: Thirty-four credits
8) Credits: A total of 120 credits, of which 100 must be taken in the College of Arts and Sciences.
9) Physical education: Completion of the University requirement. See p. 24.
Group 2: Social Sciences or History

a. Social Sciences

African Studies: Any two of 171, 172, 190, 231, 290, 301, 302, 344, 345, 351, 352, 400, 410, 420, 460, 484, 485, 495, 550, 551, 571

Anthropology: Any two courses (for 3 or 4 credits) in the Department of Anthropology, or Archaeology 100 and any 3- or 4-credit anthropology course.

Archaeology: 100 and any one of the following: Archaeology 201, 203, 301, 302, 309, 317, 358, 361, or Anthropology 216, 250, 352, 354, 355, 356, 358, 361, 435, 456, 493, 494, 656, 666, 664, 666, 667.

Asian Studies: Any two courses in Asian anthropology, economics, government, linguistics, or sociology given by the Department of Asian Studies. Studies or listed there under the areas of China, Japan, South Asia, and Southeast Asia, excluding only Freshman Seminars and courses given outside the College of Arts and Sciences. A reasonable sequence is formed by taking any two courses in the same area. Alternative sequences will, under special circumstances, be considered but require the permission of the director of undergraduate studies.

Economics: 101–102 or a combination of one of these courses and any course for which it is a prerequisite if the course is taught by a member of the Department of Economics.

Government: Any two of 111, 131, 161, 181; or any one of these courses followed by a 300-level course in the same area.

Linguistics: 101 and (1) any other course in linguistics or (2) any other course offered by the Department of Modern Languages and Linguistics for which this introductory linguistics course is a prerequisite.

Near Eastern Studies: Any two NES archaeology courses at the 200 or 300 level that form a reasonable sequence or combination.

Psychology: Any two courses in psychology with the exception of Psychology 123, 207, 222, 224, 326, 350, 361, 396, 422, 425, 429, 471, 472, 473, 475, 476, 479, 491, 492.

Sociology: Any two of 101, 103, and 105, or one of these introductory courses followed by any course at the 200 level or above in sociology.

Women's Studies: (a) Any two of 231, 238, 244, 277, 320, 321, 332, 353, 355, 395, 422, 425, 428, 450, 468; or (b) any one of 110, 365, 493, plus one course from list a. (Appropriate courses in Women's Studies taken previously may be approved by the program.)

b. History


Asian Studies: Any two courses in Asian history given by the Department of History and listed under the Department of Asian Studies under the areas of China, Japan, South Asia, and Southeast Asia, excluding only Freshman Seminars and courses given outside the College of Arts and Sciences. A reasonable sequence is formed by taking any two courses in the same area. Alternative sequences will, under special circumstances, be considered but require the permission of the director of undergraduate studies.

History: Any two courses in the Department of History.

Near Eastern Studies: Any two NES history courses at the 200 or 300 level that form a reasonable sequence or combination.

Women's Studies: Any two of 227, 238, 326, 357. (Appropriate courses taken previously may be approved by the program.)

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Group 3: Humanities or Expressive Arts

a. Humanities


Archaeology: Archaeology 100 and any of the following: Archaeology 201, 203, 301, 308, 310, 358, 360.
100 Arts and Sciences


Asian Studies: Any two courses in Asian art, literature, or religion given by the Department of Asian Studies or listed there under the areas of China, Japan, or Southeast Asia, excluding only Freshman Seminars and courses given outside the College of Arts and Sciences. A reasonable sequence is formed by taking any two courses in the same area. Any two of Asian Studies 211, 212, and 215 may satisfy this requirement. Alternative sequences will, under special circumstances, be considered but require the permission of the director of undergraduate studies. Classics: (a) two courses in Greek beginning with 201 or in Latin beginning with 205 that form a reasonable sequence, or (b) any two of the following: Classics 206, 211, 212, 217, 218, 219, 220, 221, 222, 224, 225, 232, 233, 235, 236, 237, 238, 245, 300, 309, 319, 320, 321, 322, 323, 326, 327, 329, 330, 331, 333, 336, 337, 339, 340, 350, 363, 366, 368, 423, 610, 629, 630.

Comparative Literature: Any two of the 200- or 300-level courses in comparative literature. 400-level courses may be used with the permission of the instructor.

English: Any two courses in English at the 200 level or above, except English 496. If students have used English courses to satisfy the expressive arts requirement, they should not take courses numbered in the 80s (e.g., 281, 382) to satisfy the humanities requirement.

French Literature: Any two courses from 200, 201, 202, 222, or 300-level literature courses.

German Literature: Any two courses at the 200 level or above.

Italian Literature: Any two of 201–202 or any 300-level literature courses.

Near Eastern Studies: Any two NES civilization or literature courses at 300-level that form a reasonable sequence or combination.

Philosophy: Any two courses with the following exceptions: (1) Philosophy 100, if used to satisfy the Freshman Seminar requirement, (2) combination of two courses in logic, such as 131, 231, 331, 431, 432, 436.

Russian Literature: Any two courses at the 200 level or above, except 292, 293.

Spanish Literature: Two of 201, 315, 316, 317, or any other 300-level literature courses.

Women's Studies: (a) Any two of 248, 249, 251, 348, 365, 399, 453, 456, 467, 476; or (b) any one of 30, 362, 469, 472 from list a. (Appropriate courses in Women's Studies taken previously may be approved by the program.)

b. Expressive Arts


Archaeology: Archaeology 100 and any one of the following: History of Art 220, 221, 320, 321, 322, 323, 325, 326, 327, 328, 329, 330, 423, 431, 432.

English: Any two of the courses at the 200 level or above that are numbered in the 80s (e.g., 281, 382).

History of Art: Any two courses at the 200 level or above, or Archaeology 100 and one of the History of Art courses listed under Archaeology.

Music: 6 credits in music, except Freshman Seminars and Music 122. A maximum of 4 credits in Music 231–322 and a maximum of 3 credits in Music 331 through 338 and 441 through 450 may be used to satisfy this requirement.

Theatre Arts: Any two of the 3- or 4-credit courses at the 200 level or above.

Group 4: Mathematics or an Unused Subdivision

a. Mathematics and Computer Science

Any 6 credits in Mathematics, but not including more than one course from 105, 107, 403. Computer Science 100 or 211 may be used for some of these credits. The mathematics course taken to satisfy this requirement is also satisfied by a score of 3 on the CEEB calculus BC examination. Mathematics 109 and ALS 115 (College of Agriculture and Life Sciences) do not satisfy the requirement.

b. An Unused Subdivision

A sequence of any one of the subdivisions in groups 1–3 that has not been used to fill that group's requirement.

The Major

In their last two years, students devote roughly one-half of their time to acquiring depth and competence in a major subject. The major is not intended to define a student's education or to lead to a lifetime's occupation, although it may do so. By majoring, students do advanced work and focus the full extent of their imaginative and intellectual capacities on something they care about, thereby sharpening their minds.

Students must be accepted by departments as majors before registering for courses for the junior year. Most departments and programs specify certain prerequisites for admission to the major; students should consult the departmental listings on the following pages. A department may refuse to accept into the major any student whose performance does not meet departmental standards. Some majors require courses in related subjects outside the department or outside the college, required courses taken outside the college are counted toward the 100 credits required in the College of Arts and Sciences for graduation. To seek admission into a major, students bring a copy of their transcript to an appointment with the director of undergraduate studies in their prospective major department.

Available majors. Majors are offered by each of the departments except the Department of Astronomy. There are also majors in Africana studies, American studies, archaeology, biology and society, dance, German area studies, Russian and Soviet studies, and social relations.

Some students wish to pursue an interest that cannot be met within an established major. They may, with the help of their faculty adviser, an independent major that includes courses from several departments.

Electives

Of the thirty-four courses and 120 credits required for graduation, almost one-third are free electives. How students use these electives frequently makes the difference between an ordinary and a truly interesting curriculum. Students must complete four or five courses or at least 15 credits in courses that are offered outside their major fields and which are not required for any other requirement. Students may group electives to form a concentration within one discipline or about a topic across several disciplines. Some choose to explore a variety of subjects. Electives taken in other divisions of the University may be used to gain practical training or specialized knowledge. Some students develop a concentration in one particular department or subject outside arts and sciences.

Residence

The college expects its students to earn credits toward the degree during full-time study at Cornell, normally for eight semesters. Participation in approved semester programs of study abroad, felowship programs, SEA Semester, or Cornell-in-Washington, which the college encourages, is considered study at Cornell. Students occasionally enter with advanced placement credit from other institutions (this does not include advanced placement credit from the CPT program, for which regular Cornell credit is granted), take leaves and complete courses at other institutions, or take summer courses at other institutions. The college will accept up to 30 credits from courses at other institutions as part of the out-of-college electives if the appropriate departments at Cornell approve. (These electives, of course, approved study abroad and in absencia programs, for which up to 30 credits will be accepted, and credits earned by transfer students at their first University.)

Credits earned at other institutions may not normally be substituted for the final two semesters. Nor may students leave the college after three or three and a half years and complete their degrees with credits accumulated at other institutions or through Cornell Summer Session without special permission from the Committee on Academic Records. Students are not allowed to be part-time students during their eight regular semesters unless they meet the criteria described in the sections "Part-Time Study and Pro Rata Tuition" or present convincing academic or medical reasons for part-time study.

Ninth term. Students may spend a ninth term in residence. They should discuss their program with the assistant dean for seniors and must notify the college in writing of their intention. Students receiving financial aid should discuss funding with an adviser in the Office of Financial Aid.

Acceleration

Earning a Bachelor of Arts degree from the College of Arts and Sciences normally takes eight semesters. Even if the minimum requirements can be met in fewer semesters, the college expects that students will remain registered for eight semesters. The college encourages, is considered study at Cornell. Students who plan to accelerate their graduation should be accepted into their majors early so that they can spend four full semesters in upper-level work and plan their accelerated course of study with their major adviser. They must petition to accelerate in their sophomore year. Students who decide to accelerate during their last two semesters will need to present petitions to the Committee on Academic Records. Accelerants must, of course, satisfy all the requirements for graduation and, in addition, complete at least 100 of the 120 credits with grades of C (not C–) or better. Acceleration is meant for good students, and petitions to accelerate may be denied if the academic record is not strong.

Students who plan to accelerate present petitions by the beginning of the junior year. Late petitions will be reviewed by the Committee on Academic Records and may not be approved. Accelerants must, of course, satisfy all the requirements for graduation and, in addition, they must have at least a B average by the time they graduate.

Minimum Number of Courses and Credits

Students must complete at least thirty-four courses to graduate, that is, four or five courses a semester. Most courses are assigned 3 or 4 credits. Some are assigned 2 credits and count as one-half courses toward the thirty-four. Students do not count as part of the thirty-four except in certain cases when they form a part of a series (certain offerings in mathematics, biology, and music, for instance) and two in the same series can be aggregated to count as one-half course. A 6-credit language course counts as 1½ courses, while the summer Falcon Programs in Asian languages count as 10 credits and 2½ courses each. Students must also complete 120 credits. 100 of which must be from courses taken in the College of Arts and Sciences, to earn the Bachelor of Arts degree. Credits earned from advanced placement examinations, courses approved for study abroad, and courses taken in special off-campus residential programs may be counted toward the 100 credits required within the college and also toward the required thirty-four courses.
Courses, Credit, and College Requirements

A course may not be used to fulfill more than one college requirement, with the following exceptions.

1. A course may be used to fulfill a distribution requirement and allow a major requirement, provided that the major department approves.

2. A one-semester course in foreign language that is acceptable for achieving proficiency in that language will be credited toward partial fulfillment of the distribution requirement in the humanities.

3. Students whose native language is not English who take English 211-212 may fulfill both the Freshman Seminar requirement and the appropriate distribution requirement by taking two Freshman Seminars offered in English, history, history of art, Classics, philosophy, Romance studies, Russian literature, German literature, or comparative literature.

4. Students who choose to double major may use the courses for one major as "related" hours in the other major if the subjects are indeed related and if the departments approve.

Courses used to fulfill college requirements (but not major requirements) may be taken for S-U grades.

Repeating courses. Students may repeat courses. If the instructor certifies that the course content has not been changed, credit may be granted a second time. If the content has not changed, both grades will appear on the transcript and will be included in any average that is calculated, but credit will be counted toward the degree only once. Students who plan to repeat a course should notify the Office of Records and Scheduling, 46 Goldwin Smith Hall.

Attendance in classes is a matter between students and their instructors. If a student cannot attend classes because of illness or family crisis, the Academic Advising Center will notify instructors when requested to do so, but students must arrange for making up examinations or other work with their instructors. When students will be absent because of religious holidays, they must discuss arrangements for making up their work with their instructors. Students who have to miss examinations should be sure to contact the professor. Alternative arrangements are at the discretion of the instructor.

Transferring credit. The college evaluates credit received from either another school or college at Cornell University or from another accredited institution of collegiate rank to determine the number of courses that the student may count toward a major or Arts degree. Tentative credit evaluations are normally provided to students upon request. No special permission or procedure is required. A student may complete a double major by fulfilling the major requirements in any two departments of the college. No special permission or procedure is required. Students who have earned 105 credits before the start of the seventh term are eligible for the College Scholars program, and credit may be granted a second time. If the instructor certifies that the course content has not been changed, credit may be granted a second time. If the content has not changed, both grades will appear on the transcript and will be included in any average that is calculated, but credit will be counted toward the degree only once. Students who plan to repeat a course should notify the Office of Records and Scheduling, 46 Goldwin Smith Hall.

Noncredit courses. The college does not grant credit toward the degree for all courses offered by the University, Courses in remedial or developmental reading (for instance, Human Ecology 100) and mathematics, and supplemental science courses offered by the Learning Skills Center, carry credits that are counted toward good standing in a given semester but not toward graduation. Physical education, typing, shorthand, and most military training courses are an exception for which credit is not given. Faculty legislation prevents granting credit towards the degree for service as an undergraduate teaching assistant.

Auditing. The college encourages its students to take advantage of its rich curriculum by sitting in on courses that interest them but cannot be fitted into their schedules for credit. As long as the instructor agrees, students are welcome to visit courses. Small seminars and language courses are sometimes not open to casual visitors.

Special Academic Options

Degree Programs

The following programs allow students to work toward more than one degree or alter the regular college requirements or departmental requirements for the major.

Independent Major Program

The Independent Major Program allows students to design their own interdisciplinary majors if they wish to pursue an interest that cannot be met within an established major. Proposals for an independent major must be supported by a faculty adviser and are assessed by a board of faculty members. Board members consider whether the plan is equivalent in coherence, breadth, and depth to a departmental major, whether it is well-suited to the student's academic preparation, and whether it provides a liberal education. Independent majors substitute for established majors, but students must still satisfy all the other usual requirements for the baccalaureate degree. Students should contact the Independent Major Program, Academic Advising Center, 55 Goldwin Smith Hall, for further information. Deadlines for submitting independent major proposals are listed on the calendar supplement for the College of Arts and Sciences.

College Scholar Program

The College Scholar Program frees no more than forty students in each freshman class from the usual college requirements for a degree and allows them to design their own academic programs. It is meant to serve students whose interests and talents do not easily fit into the usual departmental majors, who demonstrate exceptional promise, and who show the maturity to plan and carry out, with the help of their adviser, a well-designed program of studies. College Scholars do not all design the same kind of program; some, for instance, pursue diverse interests, while others integrate a variety of courses with a common theme.

Double Majors

A student may complete a double major by fulfilling the major requirements in any two departments of the college. No special permission or procedure is required. Students who have earned 105 credits before the start of the seventh term are eligible for the College Scholars program, and credit may be granted a second time. If the instructor certifies that the course content has not been changed, credit may be granted a second time. If the content has not changed, both grades will appear on the transcript and will be included in any average that is calculated, but credit will be counted toward the degree only once. Students who plan to repeat a course should notify the Office of Records and Scheduling, 46 Goldwin Smith Hall.

Special Interest Options

The following options do not alter the college's requirements but enable students to pursue special interests within the usual program. Independent course work is involved in independent study and in the Undergraduate Research Program: premedical and preprofessional counseling helps students make appropriate use of the regular curriculum.

Special Academic Options 101
Independent Study

Independent study affords students the opportunity to pursue special interests not treated in regularly scheduled courses. A faculty member, who becomes the student’s instructor for the course, must approve the student’s program of study and agree to provide continuous supervision of the work. In one semester students may earn up to six credits with one instructor or eight credits with more than one instructor.

Undergraduate Research Program

The Undergraduate Research Program is a clearinghouse that helps students find opportunities to participate in faculty research and helps faculty find students qualified and interested in becoming research apprentices. Students almost always contribute significantly to the projects they work on. Occasionally they become co-authors of scholarly articles with their faculty supervisors.

Students interested in this program should see Marilyn Williams, Academic Advising Center, 55 Goldwin Smith Hall.

Intensive Language Study

More than forty languages are taught in the College of Arts and Sciences, and some of them are available only at Cornell. A full range of language, literature, and cultural courses are available in most of the major areas of modern languages, through the joint efforts of the Department of Modern Languages and Linguistics and the departments that specialize in literary and cultural study: the Departments of Asian Studies, German Literature, Near Eastern Studies, Romance Studies, and Russian Literature. Semi-intensive courses afford students the option of accelerating the development of language skills.

FALCON Program (Full-Year Asian Language Concentration), FALCON allows students who are interested in the Far East to study Chinese, Japanese, or Indonesian exclusively for one year. They gain proficiency in the language and familiarity with the culture. Students who are interested in the Far East should be aware of the opportunities here to pursue rapid and thorough beginning studies on campus with the objective of studying abroad later—in China, Japan, or Southeast Asia.

Language House Program (152 Uris Hall), Pillar C. Greenwood, coordinator

A complement to classroom cultural and linguistic instruction, the Language House Program combines residential and academic opportunities to offer Cornell students a place to prepare for, and return to from, studies in foreign countries. The houses include French, German, Chinese (Mandarin), and Spanish languages.

Prelaw Study

Law schools neither require nor prefer any particular program of study; they do seek students with sound training in the liberal arts. It is important that students plan a program in which they are interested and do well. Beyond that, students are advised to take courses that will develop the powers of precise, analytical thinking and proficiency in writing and speaking.

The college offers a concentration in law and society. Students should work towards completion of this concentration because they are interested, not because they believe it will convince law schools of their interest.

The adviser for students in the College of Arts and Sciences who are applying to law school is assistant dean Buettner, Academic Advising Center, 55 Goldwin Smith Hall.

Premedical Study

The breadth and depth afforded by a liberal arts education are invaluable for people planning medical careers, whether they intend to practice or go into medical research. Such training has a profound effect upon the doctor’s usefulness to patients, and it affords the flexibility of mind that is needed for major research undertakings. Medical and dental schools do not prescribe a particular major; they do, however, require particular undergraduate courses. Students who are interested in medical careers are urged to visit the Health Careers Office in Barnes Hall for help in planning their undergraduate program.

The adviser for students in the College of Arts and Sciences who are planning careers in medicine is assistant dean Turner.

Off-Campus Programs

Many students find it important to their majors or to their overall academic programs to study abroad for one or two semesters. When it makes academic sense, the college encourages its students to pursue such studies and grants credit toward the degree for work satisfactorily completed.

Study Abroad

In 1985–86, 112 students in the college studied abroad. Through the Cornell Abroad office, Cornell has established affiliations with several universities in Britain, Denmark, Egypt, and Israel, as well as its own programs in Freiburg Germany, Italy, Spain, and Switzerland. Students have studied in those countries and in others all over the world. Before planning a program for study abroad, students should consult the Office of Dean Rosenberg, Academic Advising Center, 55 Goldwin Smith Hall, who will help them find the program most appropriate to their academic goals. A request to study abroad must have the support of the faculty adviser, and courses must be approved by the directors of undergraduate studies in the departments teaching those subjects. Credits earned abroad may count as part of the 100 credits required within the College of Arts and Sciences. Normally, transfer students will not be allowed to study away from Cornell.

When plans are final, the student should submit the completed documentation to assistant dean Rosenberg. College permission will be granted on condition that the student is in good academic standing the semester prior to departure. The University charges regular Cornell tuition for study abroad. Qualified students on financial aid may keep their aid. No more than two semesters abroad are allowed.

Off-Campus Residential Programs

A number of residential programs allow students to concentrate on one subject, under the instruction of Cornell faculty specialists in that field of study. These programs provide an opportunity to be involved in a shared academic adventure, in situations that demand discipline, hard work, cooperation, and tolerance. The experience is an exciting, challenging component of a liberal education.

Summer residential programs in archaeology. During the summer months students may participate in one of the Cornell-sponsored archaeological projects in New York State, the Mediterranean region, Central America, or South America. Each project includes lectures that afford a broader understanding of the culture. The Mediterranean excavations encompass the early Bronze Age through the Roman period. The Aegean dendrochronology project will furnish scientists and archaeologists with an exceptionally accurate dating technique. Students should contact the Archaeology Program for information about the sites in the Western Hemisphere, and the Departments of Classics and Near Eastern Studies about those in the Mediterranean region.

Marine science. Sholes Marine Laboratory is a seasonal field station designed to introduce undergraduates to the marine sciences. The laboratory is located on Appledore Island, six miles off the Maine and New Hampshire coasts. Students should contact the Division of Biological Sciences for further information.

Cornell-in-Washington. The Cornell-in-Washington program enables a limited number of advanced students to study questions of public policy and to do supervised research during a term of residence in the capital. Students choose among several seminars taught by distinguished faculty in residence. They become familiar with the various sources of information and develop research techniques. The program also offers a unique internship program. Students who wish to serve an internship in a federal agency or congressional office take part in a public-policy seminar. They define and carry out individual research projects that explore the connections between abstract policy issues and the day-to-day activities of the office. Potential internships are arranged through, and approved by, the Cornell-in-Washington program. Students are admitted to the Cornell-in-Washington program by the Department of Government. For further information, see p. 10 or inquire at 104 McGraw Hall.

Fieldwork

Sometimes it is appropriate for students to include fieldwork as part of their major. A three-member faculty committee helps the student plan the project, arranges for ongoing supervision, and evaluates the project at the end of the term. Fieldwork almost always involves writing a long term paper or several short ones, as well as practical experience. All proposals for fieldwork must be presented in advance to the Academic Records Committee for approval. A maximum of 15 credits in fieldwork may be earned. For further information students should contact assistant dean Unsworth, Academic Advising Center, 55 Goldwin Smith Hall.

Advising

The following advisers and offices provide information on college procedures and regulations, academic advising, or counseling.

Faculty Advisers

Faculty advisers help students design programs of study and advise students about ways to achieve their academic goals. Faculty members volunteer to act as advisers to new students in the college; advisers and advisees meet during orientation week to plan the student's program. Students are encouraged to see their advisers again early in the term, before it is too late to drop courses and before signing into courses for the following term, to discuss their academic program and to become better acquainted with difficulties that may frequently be solved or avoided if students and advisers recognize problems early.

Advisers must approve each semester's program and any course changes. Students who would like to petition for an exception to college rules should discuss the matter with their advisers; the adviser must review and sign the petition before it may be acted upon. No one else may sign for the faculty adviser.

Advisers may also help students with study or personal problems or direct them to other offices on campus where help is available.

Student Advisers

Each new student is also assigned a student adviser who can provide information about the college’s requirements, courses, and instructors and about life at Cornell.

Major Advisers

After acceptance into a major program, students are assigned a major adviser, a faculty member in the major department, with whom they make many of their most important decisions at Cornell. The adviser must approve the student's course of study and eventually certify the completion of the major. The major adviser should be consulted by the student about all academic plans, including study abroad, acceleration, and
The Academic Advising Center, 55 Goldwin Smith Hall, serves as a resource for faculty and student advisers and for students themselves. The advisor's support is especially important if a student petitions for an exception to the requirements for the degree.

Academic Advising Center

The Academic Advising Center, 55 Goldwin Smith Hall, serves as a resource for faculty and student advisers and for students themselves. The advisor's support is especially important if a student petitions for an exception to the requirements for the degree.

Registration and Course Scheduling

Registration with the University

All students must register with the University at the beginning of each semester. Registration materials are available at a time and place announced each term by the Office of the University Registrar. All students must register with the University at the beginning of each semester. Registration materials are available at a time and place announced each term by the Office of the University Registrar.

Enrollment in Courses of the College of Arts and Sciences

The Academic Advising Center conducts briefings during orientation week for incoming freshmen and transfer students about procedures for scheduling courses.

Continuing Students

Continuing students are expected to select and schedule courses in advance during the previous term. Students who fail to sign into courses during the designated period must wait until the beginning of the semester and may have difficulty securing places in the courses they desire. Students may schedule up to 18 credits during the advance scheduling period. Information and materials will be available in the Records and Scheduling Office, 46 Goldwin Smith Hall. Before signing into courses, students should make appointments with their faculty advisers to plan their programs.

Special Registration Options

Adding and Dropping Courses

After advance course enrollment, students may not add or drop courses until the new term begins. All program changes must be approved by the course instructor (or by the person designated by the appropriate department) and by the faculty adviser. During the first three weeks of the semester, course changes may be made without fees. Add/drop forms are available in the Records and Scheduling Office, 46 Goldwin Smith Hall.

Drop Down the Semester

After the third week of classes courses may be added, and after the eighth week courses may be dropped, by petition. Students who want to drop a course after the eighth week of the term must meet with the assistant dean and submit a petition by the end of the twelfth week of the semester. Courses may be dropped between the ninth and twelfth week of the term if (1) the instructor certifies the student has worked hard to master the material and has completed assigned work and taken exams, (2) the instructor and the adviser approve, and (3) no issue of academic integrity is at stake. The records of students whose course loads drop below 12 credits will be reviewed at the end of the semester.

Withdrawals

A withdrawal is a voluntary severance of connection with the University. If a student wishes to withdraw after registering for the term, the withdrawal must be requested before the specific and eighth week of classes. A notation of "W" will appear on the transcript for any course dropped after the eighth week. Upon withdrawal it is assumed that the student will not wish to register in the college. Students who seek a second readmission after withdrawing from the college appeal to the Committee on Academic Records. If a student fails to register for a term and does not request a leave, the student will be withdrawn from the college for failure to register.

Transferring within Cornell (Internal Transfer)

Internal transfer from one college or school at Cornell into another is attractive for many students whose intellectual interests change. Students who wish to transfer should discuss their eligibility with a counselor at the new school or college.

Limits on Courses and Credits

Students must take an average of four or five courses (15 credits) each semester in order to graduate in eight terms. At a minimum, students must carry three or four courses (12 credits); if for compelling personal or academic reasons students need to carry fewer than 12 credits, they should consult the faculty adviser and the assistant dean of their class. Permission is by petition only. Completion of fewer than 12 credits without permission results in unsatisfactory academic standing. First-term freshmen may not register for more than 18 credits. Students may register for more than 18 credits a term only if their previous term's average was a B or higher and if their faculty advisers approve. No more than 22 credits may be taken in a regular semester without permission of the Committee on Academic Records.

Any student who is not officially enrolled in a schedule of courses by the end of the third week of classes may be withdrawn from the college.

Forgery on Forms

Students must have course registration forms and all petitions signed by their faculty advisers. The purpose of the signature is to attest that advising has taken place. Forgery signatures or credentials on college forms is an academic offense in that it interferes with advising; sometimes it constitutes academic fraud. In all cases of forgery on academic forms, the effect of the forged document shall be negated. The student may then petition properly to do whatever he or she attempted to do improperly. The incident shall be made a matter of record in the Academic Integrity Hearing Board confidential file for forgeries. If a student forges more than once or if the forgery would advance the student's academic standing, the student will be subject to an unspecified length of time (up to five years) with the understanding that the student may return at the beginning of any term after the medical condition in question has been corrected. In some cases students must satisfy the Gannett Health Center that the condition has been corrected before they may return.

Conditional leaves may be granted if the student is not in good standing or, in unusual circumstances, after the eighth week of the term. Normally students may not return from conditional leaves for at least two terms, or until specific and individual conditions, such as completing outstanding work, have been met.

Required leaves: The Academic Records Committee may require a leave of absence if a student is in academic difficulty. See the section "Academic Actions."

Any student who wishes to take a leave of absence should consult an assistant dean in the Academic Advising Center. Upon readmission, the student's graduation date will be recalculated according to the number of terms completed, the number of acceptable credits earned toward the degree, and the requirements for graduation. Students who take courses elsewhere while on leave may petition to have credits accepted as part of the 20 out-of-college credits of the 120 credits needed for graduation. Approval depends upon the judgment of the relevant departments and acceptable grades.

1) Personal leaves impose no conditions concerning the right to reenter the college except for the five-year limit. Readmissions otherwise are granted upon request made one month before the beginning of the term in which the student wishes to return.

2) Medical leaves are granted by the college only upon recommendation by a physician from Cornell Health Center. Such leaves are granted for an unspecified length of time (up to five years) with the understanding that the student may return at the beginning of any term after the medical condition in question has been corrected. In some cases students must satisfy the Gannett Health Center that the condition has been corrected before they may return.

3) Conditional leaves may be granted if the student is not in good standing or, in unusual circumstances, after the eighth week of the term. Normally students may not return from conditional leaves for at least two terms, or until specific and individual conditions, such as completing outstanding work, have been met.

4) Required leaves: The Academic Records Committee may require a leave of absence if a student is in academic difficulty. See the section "Academic Actions."

Any student who wishes to take a leave of absence should consult an assistant dean in the Academic Advising Center. Upon readmission, the student's graduation date will be recalculated according to the number of terms completed, the number of acceptable credits earned toward the degree, and the requirements for graduation. Students who take courses elsewhere while on leave may petition to have credits accepted as part of the 20 out-of-college credits of the 120 credits needed for graduation. Approval depends upon the judgment of the relevant departments and acceptable grades.

Withdrawals

A withdrawal is a voluntary severance of connection with the University. If a student wishes to withdraw after registering for the term, the withdrawal must be requested before the specific and eighth week of classes. A notation of "W" will appear on the transcript for any course dropped after the eighth week. Upon withdrawal it is assumed that the student will not wish to register in the college. Students who seek a second readmission after withdrawing from the college appeal to the Committee on Academic Records. If a student fails to register for a term and does not request a leave, the student will be withdrawn from the college for failure to register.

Transferring within Cornell (Internal Transfer)

Internal transfer from one college or school at Cornell into another is attractive for many students whose intellectual interests change. Students who wish to transfer should discuss their eligibility with a counselor at the new school or college.

In some cases students who wish to transfer into the College of Arts and Sciences may transfer directly. In other cases they may be referred to the Division of Undergraduate Studies. Students who take courses elsewhere while on leave may petition to have credits accepted as part of the 20 out-of-college credits of the 120 credits needed for graduation. Approval depends upon the judgment of the relevant departments and acceptable grades.
Academic Standing

Students are in good standing for the term if they successfully complete at least 12 credits by the end of the term and receive no more than one D and no F or U grades. If a student completes only three courses, all grades must be above D.

Honors

Dean's List

The requirements for the Dean's List are based on the number of letter grades of A (i.e., A, A+, or A-) a student receives for grades. S grades and credits for S grades are not considered. Students must have the following number of grades of A: 12 credits, all A's; 13 or 14 credits, 10 A's, the rest B's. For 15 credits students must have 8 credits of A's, the remainder B's. In the 15-credit category, if any of the letter grades received are C or D+, there must be an equal number of A credits in addition to the 8 credits of A's. Grades of C- or below are automatic disqualification from the Dean's List. Any failure or grade of U in a course that counts toward credit for graduation disqualifies students for the Dean's List.

1) Incomplete grades. Qualification for the Dean's List is dependent on a student completing the requirements for the Dean's List by the end of the term. If there is an Incomplete grade, the student will be considered for the Dean's List retroactively when the Incomplete is made up.

Makeup grades for incompletes are considered towards the Dean's List as if they were S-U grades. Students must first meet the basic criteria of qualifying without consideration of the makeup grade or the credits of that grade. If the makeup grade does not disqualify students from making the Dean's List (no U's of C- or below), then the student's name will be retroactively added.

2) Courses not considered toward the Dean's List are any courses that do not fulfill any of the college requirements for graduation (see the section on "Noncredit Courses" above). In addition, credits for courses graded S, courses with "W" (withdrawn after the eighth week of classes), courses taken for zero credits, supplemental courses (001, 003, etc.), and Mathematics 109 are not considered in the calculation of the Dean's List.

Two-term honors courses are not usually given a letter grade until work is completed. Consideration for the Dean's List is made after the second semester of a student's work. This grade will be considered the appropriate grade for both semesters of the course. For example: an 8-credit two-term grade of A would be counted as 4 credits A for the first semester of the honors work and 4 credits A for the second semester. If the grade and hours are sufficient to qualify the student for the previous term, the student's name is then retroactively added to the Dean's List.

Bachelor of Arts with Honors

Almost all departments offer honors programs for students who have demonstrated exceptional ability in the discipline and who seek an opportunity to explore branches of their subject not represented in the regular curriculum or to gain experience in original research. The honors programs are described by individual departments in the following sections. The degree of Bachelor of Arts with honors will be conferred upon students who, in addition to having completed the requirements for the degree of Bachelor of Arts, have satisfactorily completed the honors program in their major and have been recommended for the degree by their major department, the Independent Major Program, or the College Scholar Program.

Bachelor of Arts with Distinction

The degree of Bachelor of Arts with distinction in all subjects will be conferred upon students who, in addition to having completed the requirements for the degree of Bachelor of Arts, have:

1) completed at least 60 credits while registered in regular sessions at Cornell;
2) ranked in the upper 30 percent of their class at the end of their seventh semester, or next-to-last semester for transfers and accelerants;
3) received a grade below C- in no more than one course;
4) received no failing grade;
5) maintained good standing in each of their last four terms;
6) have no incompletes remaining on their records.

Failure to Maintain Good Standing

Students are not in good standing if they complete fewer than 12 credits; if they have more than one D, or one D in a course in which only incomplete courses, or any F or U grades; if they have not made satisfactory overall progress in grades or credits (whether due to failures or incompletes) or in the requirements of the college or the major. Such students will be considered for academic action by the Committee on Academic Records, the Committee of Deans, or one of the deans of the college.

Academic Actions

Warning. Any student who fails to maintain good standing may be warned. The warning may be given by a committee of assistant deans in the college or by the faculty's Committee on Academic Records. A warning is posted on a student's Permanent Record Card but is not reported to the University registrar and does not appear on official transcripts.

Final warning. Students whose work is so seriously deficient that they risk being required to leave may be placed on final warning by the Committee on Academic Records. A warning does not necessarily precede a final warning. A final warning is posted on the student's Permanent Record Card but is not reported to the University registrar and does not appear on official transcripts.

Required leave of absence. A student in serious academic difficulty may be required by the Committee on Academic Records to take a leave of absence, normally for a full year. Usually, but not necessarily, the Committee on Academic Records will impose a final warning before imposing this action. Before imposing this action, the Committee on Academic Records will consider the student's request for reconsideration, after which the student may appeal to the Committee of Deans, or one of the deans of the college.

Grades

Letter Grades


S-U Grades

The S-U option allows students to explore unfamiliar subject areas without being under pressure to receive high grades. It is not meant to reduce the amount of work a student completes in a course or the amount of effort a student devotes to a course. Students may elect the S-U option in courses used to satisfy major requirements or for failure to make satisfactory overall progress in grades, credits, or the requirements of the major. This action expels the student permanently from the college.

May not reregister. The Committee on Academic Records may dismiss a student from the college because of a highly unsatisfactory record for one term or for failure to make satisfactory overall progress in grades, credits, or the requirements of the major. This action expels the student permanently from the college. May Not Reregister is posted on the student's Permanent Record Card; the University registrar is notified and "May Not Reregister in the College of Arts and Sciences" and the date will appear on the official transcript.

Students being reviewed for academic action are urged to present evidence that will help explain their poor academic performance. Students may appeal a decision or action of the committee if they have new evidence to present.
letter grade within the first five weeks of term, although a $10 fee is charged after the third week. Any senior planning to take a course for an S-U grade in the last semester should consult with assistant dean Buettner.

Incomplete Grades
A grade of incomplete signifies that a course was not completed before the end of the term for reasons beyond the student's control that are acceptable to the instructor. Students must have substantial equity in the course; that is, they must be able to complete the remaining work without further registration and must have a passing grade for the completed portion. When a grade of incomplete is reported, the instructor will state what work must be completed, when it must be completed, and the grade earned even if the work is not completed by that date. Unless the instructor stipulates otherwise, students will be allowed one term plus one summer to make up the work. When a final grade is recorded, it is recorded on the official transcript with an asterisk and a footnote explaining that this grade was formerly an incomplete.

Once an incomplete is assigned, the college does not change it unless and until the faculty member submits a change of grade form or gives written permission to “freeze” it as an incomplete. The college does not automatically change incompletes to Fs after a certain lapse of time or implement the conditions on the incomplete form. Students must consult the instructors to resolve incompletes.

R Grades
R designates two-semester or yearlong courses. The R is recorded on the student’s Permanent Record Card at the end of the first term. The grade recorded at the end of the second term shows the student’s level of performance in the course for the entire year. The total credits that will be earned for the whole course are listed each term.

Grade Reports
Grade reports for the fall term are included in spring-term registration materials; grade reports for the spring term are mailed to students at their home addresses unless alternative addresses are reported to the college or University registrar by mid-May.

The college does not compute class rank.

Calendar Supplement
All of the dates in the University calendar at the front of this volume apply to all Cornell students. Listed below are some additional dates that are of importance for students in the College of Arts and Sciences.

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<tr>
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<th>Fall</th>
<th>Spring</th>
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<tbody>
<tr>
<td>First deadline for submitting independent major requests</td>
<td>Sept. 3</td>
<td>Feb. 4</td>
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<td>Go to Academic Advising Center, 55 Goldwin Smith Hall, for further information.</td>
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<tr>
<td>Last day for adding courses without petition</td>
<td>Sept. 17</td>
<td>Feb. 13</td>
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<tr>
<td>Last day for dropping courses without $10 fee</td>
<td>Sept. 17</td>
<td>Feb. 13</td>
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<tr>
<td>Last day for changing grade option (S-U)</td>
<td>Sept. 17</td>
<td>Feb. 13</td>
</tr>
<tr>
<td>Second deadline for submitting independent major requests. Go to Academic Advising Center, 55 Goldwin Smith Hall, for further information.</td>
<td>Oct. 8</td>
<td>March 11</td>
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Courses and Departments

Special Programs and Areas of Concentration
The college offers a number of special and interdisciplinary programs that are described following the departmental program descriptions. Students may devise an independent major with the aid of any of these programs or develop an informal minor field. (Informal minors are not listed on the student’s official record.)

General Education Courses
See also “Common Learning Courses,” p. 10.

The introductory and advanced courses offered by departments in their respective disciplines and fields comprise the bulk of the curriculum in the College of Arts and Sciences. Most of these courses are accessible to almost all students who are interested in them. However, the faculty of the college also offers general education courses, including interdisciplinary courses for a broad audience, courses that provide insight into a particular discipline for students who are not specializing in that field, and courses for advanced students that consider a discipline in terms of its history, its presuppositions, or its relation to other branches of knowledge. The following courses have been identified by the various departments of the College of Arts and Sciences as particularly appropriate, by that definition, for general education. For full course descriptions consult the departments’ sections of the catalog.

American Studies
Some professors in English and history with an interest in American studies regularly teach courses that emphasize the interconnections of literary and historical materials. Some courses, such as History 275, focus on these interconnections with a nonspecialist audience in mind; others, such as English 464, aim at an upper-level audience to put literature and history in a comparative perspective with respect to a common subject. These purposes may suit not only American studies, English, or history majors, but the general-education interests of nonmajors. Members of the American Studies Committee can be consulted about the pertinence of their courses to general education.

Archaeology
Several members of the Archaeology Program offer general education courses suitable for nonmajors. These are listed under the departments that offer archaeology courses, such as the Departments of Anthropology, Classics, History of Art, and Near Eastern Studies. The Archaeology Program itself also offers:

203 Early People: The Archaeological and Fossil Record (also Anthropology 203) Fall. 3 credits. T R 1–2:15. T. P. Valman.

Asian Studies
211 Introduction to Japan Fall. 3 credits (4 credits with a special project; consult instructor for information). M W 11:15 plus disc, F 9:05, 11:15, 12:20, or 1:25. Staff.

212 Introduction to China Spring. 3 credits (4 credits with a special project; consult instructor for information). T R 1:25 plus disc, R 2:30 or 3:35 or F 10:10 or 11:15. E. Gunn.
German Literature

349 Anti-Semitism in Germany and the Jewish Response (also Near Eastern Studies 349) Spring. 4 credits. Reading knowledge of German helpful, though the basic texts will be read in English. T R 2:30–3:45. S. L. Gilman.

381 Marxist Cultural Theory (also Comparative Literature 381) Fall. 4 credits. T R 12:20–1:35. W. Cohen, P. Hohendahl.

605 Introduction to Modern German Literature Theory with an Emphasis on Contemporary Criticism (also Comparative Literature 605) Fall. 4 credits. R 2:30–4:25. P. U. Hohendahl.

690 Feminism and the Politics of Literary Theory Spring. 4 credits. Open to qualified undergraduates with permission of instructor. Reading knowledge of German recommended but not required. T 1:25–3:25. C. A. Martin.

History of Art

All 200-level courses and some 300-level courses. See department listing.

Psychology

326 Evolution of Behavior Fall. 4 credits. T R 2:30–4:25. R. Johnston.


Russian Literature

308 Themes from Russian Culture Spring. 4 credits. M W F 1:25. C. G. Emerson.


378 Teaching and Learning: Ideas of Education in the Western Tradition (also Comparative Literature 387) Spring. 4 credits. M 2:30–4:30 plus one hour to be arranged. P. Carden and guest lecturers.

388 Ideas and Form in Novels of Social Inquiry (also Comparative Literature 388) Fall. 4 credits. M W F 9:05. G. Gibian.

418 Pedagogy and the Nineteenth-Century Novel (also Comparative Literature 418) Fall. 4 credits. M 2:30–4:30 plus one hour to be arranged. P. Carden.

Akkadian

See Department of Near Eastern Studies.

American Studies


The Major

The major in American studies, appropriate for a wide variety of future vocations, is basically a program of coordinated study in the history and literature of the United States. It is not a "double major." The prerequisites are minimal: one course in European, British, or American history at the 100 or 200 level and one course in British or American literature at the 200 level. The major itself is structured and demanding, and students who expect to become American studies majors should apply to the chairman to arrange for a major adviser.

In consultation with their advisers, American studies majors elect 32 credits (or eight courses) of work in the history and literature of all three large periods into which an account of the nation's development can be divided, defined for the purposes of the program as colonial, nineteenth century, and twentieth century. In order to gain both depth and breadth, they select as an area of concentration either a single period (or the connections between two of the periods) and take either 16 credits in one period and 8 credits in each of the other two, or 12 credits in each of the two periods whose connections constitute the focus of the study and 8 credits in the third. In addition, they take one of the adviser-approved interdisciplinary seminars at the 400 or 600 level. When the subject matter is appropriate, such a seminar may count toward the satisfaction of the period requirements. Students may divide the work between history and literature in whatever proportion serves their interests, provided that they take no more than two-thirds of their courses in any one department.

Beyond the basic requirements in American history and American literature, 12 credits above the elementary level are required in allied subjects. Eight credits of work are in the history or literature of, or both, of another related culture; and 4 credits are in American thought, society, or culture studies from the perspective of another discipline such as anthropology, economics, government, history of art, and sociology. (This last 4-credit requirement may be satisfied outside the college.)

Courses in American history that will satisfy the 32-credit requirement described in the second paragraph are offered by the Department of History; those in American literature are offered by the Department of English, the Department of Theatre Arts, and the Africana Studies and Research Center. Occasionally a course that fits an individual student's program may be offered elsewhere. Substitution will depend on the adviser's approval. Advisers determine what courses count for the interdisciplinary seminar.

Candidates for honors must maintain an average of B + in courses pertinent to the major. To be eligible for a degree with honors in American studies, a student must in the senior year (a) either write an honors essay for American Studies 493, Honors Essay Tutorial, or submit to the American Studies Committee three term papers written for courses in the major, and (b) take an oral examination in the declared area of special interest.

Anthropology


Anthropology grew out of curiosity about the ways past and present human societies have differed and have been similar. As a craft, anthropology has developed and borrowed many strategies to approach these differences and uniformities. Some anthropologists, concerned with cultures long gone or destroyed by the spread of empires, others are sociocultural, dealing with recent and contemporary rural and urban societies in all areas of the world through a variety of social scientific and humanistic techniques. Still others are biological and evolutionary, stressing human evolution and biological uniformity and diversity. In-depth field studies, excavations, laboratory analysis, the
interpretation of symbol systems, and varieties of comparative methodologies are all part of anthropology.

Anthropology takes humanity in the broadest sense as its subject matter. Two 100-level courses (Anthropology 101—Introduction to Anthropology: Biological and Ecological Anthropology, and 102—Introduction to Anthropology: Social-Cultural Anthropology) provide a general introduction to the anthropological enterprise in its varied dimensions. Several 200-level courses (203, 212, 214, 216) explore major strategies for doing anthropology, lessons learned so far, and questions remaining to be explored. Nature and Culture (215) focuses on fundamental questions about the relationships between the biological and cultural facets of human nature. The other departmental courses deepen and broaden the perspective on anthropology brought to bear on the study of humankind. Because anthropology is intrinsically interdisciplinary, all courses numbered below the 500 level are open to all students unless otherwise stated in the course description.

The Major

The student who majors in anthropology must:

1) Take two courses at the 100 or 200 level that provide a broad overview of the discipline as a whole and its major subdisciplines: archaeological anthropology, biological and ecological anthropology, and sociocultural anthropology. Courses that provide such an overview include Anthropology 101, 102, 203, 211, 212, 214, and 216. Preferably these courses will be taken in the freshman and sophomore years.

2) Take Anthropology 300. The Discipline of Anthropology, no later than the fall term of the junior year. Because 211 provides a synthesis of the relationships between the biological and cultural dimensions of human nature, it is also recommended for majors.

3) Take at least one course in each of the following five categories: category III, Archaeological Courses; category IV, Biological and Ecological Anthropology; category V, Sociocultural Anthropology; category VI, Theory and History of Anthropology; category VII, a course that focuses on some world area.

4) Develop one or more areas of specialization within the discipline in consultation with their or his faculty adviser. Examples of such specializations include sociocultural anthropology, archaeological anthropology, theory and history, area studies, and biological and ecological anthropology. Students interested in such specializations must consult with the director of undergraduate studies, who will refer them to an appropriate academic adviser. When appropriate, special provisions for meeting major requirements may be arranged with the adviser’s approval.

5) Take a total of 32 credits of course work, in addition to Anthropology 300, beyond the introductory level. Up to 12 credits of course work in cognate disciplines (see category VIII) related to the student’s specialization may be accepted for the major with the permission of the faculty adviser.

Honors. Anthropology majors interested in the honors program should consult the director of undergraduate studies before the beginning of their senior year and apply for admission to the program. Candidates for the degree of Bachelor of Arts with honors in anthropology must complete a thesis in the final term of the senior year. Students may enroll in Anthropology 497, 498, Topics in Anthropology, open arrangement with instructor. Not offered 1986–87.

Facilities

The anthropology laboratory contains a small statistical and research laboratory, drafting and computerized drafting and photographic equipment. In addition, the department has a collection of archaeological and ethnological materials used in teaching and research.

Special Programs

Specialized individual study programs are offered in Anthropology 497–498, Topics in Anthropology, open to a limited number of juniors and seniors who have obtained consent of the instructor. Undergraduates should also note that most 600-level courses are open to seniors if consent of the instructor is obtained.

The Department of Anthropology holds colloquia throughout the academic year. Faculty members from Cornell and outside universities participate in discussions of current research and problems in anthropology. Students are encouraged to attend.

Anthropology majors have also established an anthropological film club that screens both ancient and modern films in conjunction with graduate students and faculty in the department.

I. Introductory Courses (Including Freshman Seminars)

Note: For additional Freshman Seminars in anthropology see “Freshman Seminars” and the Freshman Seminar Program’s special brochure.

101 Introduction to Anthropology: Biological and Prehistoric Perspectives on the Development of Humankind

Fall. 3 credits (4 by arrangement with instructor).


The biocultural development of humans and the broad implications of the biological and cultural diversity are explored through consideration of human evolution from the remote past to the present. Biological anthropology, archaeology, human ecology, and nutrition provide the conceptual bases for understanding the processes of biological adaptation in humankind.

102 Introduction to Anthropology: Social-Cultural Perspectives on Humankind

Spring. 3 credits (4 by arrangement with instructor).


An introduction to cultural anthropology through ethnographies, or the descriptive accounts of anthropologists. Through readings and lectures students acquaint themselves with a number of cultures from several parts of the world. The cultures range in form from those of small-scale tribal societies to those of state societies. Throughout the course we attempt to make sense of exotic cultures in their own terms.

Attention is focused on variation in cultural patterns as they are expressed in social, economic, and ritual practices. In this encounter the principles of anthropology, as a comparative enterprise that poses distinct cultural frameworks in relief, will be developed. Fiction, films, and exercises supplement the formal anthropological materials.

121 Encounters with Other Cultures

Spring. 3 credits. Freshman Seminar.

MWF 1:25. B. Lambert.

A survey of writing by anthropologists and other travelers who have told of their experiences as participants in other societies and as interpreters of other cultures. Students discuss and write about ways of playing the outsider’s role and changes in the traveler’s own outlook. Some of the lectures deal with the cultural contexts of the readings and thereby provide an introduction to the materials of cultural anthropology.

127 Anthropology of the Arts


205 Ethnographic Films

Fall and spring. 2 credits.

W 7:30–9:25 p.m. Staff.

Human cultural and social variability is explored through a series of ethnographic films, and readings and lectures relating to these films. The films are chosen to show peoples living in a variety of ecological situations and at different levels of social complexity in various parts of the world (i.e., Africa, Asia, Australia, the Americas). Readings and lectures will use the concepts and theories of cultural anthropology to interpret the significance of the different modes of life shown in the films.

211 Nature and Culture

Spring. 3 credits (4 by arrangement with instructor).

MWF 1:25. P. S. Sangree.

Cultural anthropology, because it encompasses the comparative study of man in society, provides a unique vantage on the nature of man. One of the focal questions of the discipline is the relationship between the physical/biological and symbolic/moral worlds in which we live. This inquiry places anthropology squarely at the center of social theory, since all social theories, and political ideologies are founded on premises regarding human nature. Through study of a variety of issues and debates (e.g., “sociobiology,” the origin and meaning of the incest taboo), this course examines a variety of past and current attempts to explain the relationships between nature and culture in human life.

212 Social Anthropology

Fall. 3 credits (4 by arrangement with instructor).

MWF 11:15. C. J. Greenhouse.

One of the ways by which anthropologists study human life is by examining social institutions in terms of their relationship to culture. Social anthropology is the study of social relationships and the ideas about existence implicit in them. In the course we consider institutions—family, government, economics, religion, and so on—as contexts that define and are defined by social interactions and the meanings societies accord them. We explore the world’s cultural diversity, as well as the question of what cultural differences mean, through a series of ethnographic case studies. The course is open without prerequisite to majors in anthropology and other social science disciplines and to other students with substantial experience in the social sciences.

214 Humankind: The Biological Background

Spring. 3 credits (4 by arrangement with instructor).

MWF 11:15. R. Dyson-Hudson.

Anthropological inquiries about human origins, biocultural diversity, and behavior require an understanding of the causes and effects of evolution. This survey of biological anthropology examines controversies about human origins and antiquity, human adaptations to past environments, sociobiology, biological variability in ancient and modern populations, and the bases for the diversity of cultural behaviors. Lectures are supplemented with films and guest lecturers.

[216 Ancient Societies]

Fall. 3 credits (4 by arrangement with instructor). Not offered 1986–87.

II. Courses Intended Primarily for Majors

300 The Discipline of Anthropology

Fall. 4 credits. Limited to, and required of, anthropology majors, who must take this course no later than the fall term of the junior year.

T R 2:30–3:45. A. T. Kirsch, with the anthropology faculty.

The course is an overview of the field of anthropology; it provides a systematic treatment of the discipline, the concepts that are used, the persistent questions that are asked, the specializations within the field, and the shared goals and differing viewpoints. The course is intended to help majors plan their course work.

491 Honors Thesis

Fall. 4 credits. Prerequisite: consent of the Honors Committee. Intended for majors graduating in midyear.

Hours to be arranged. Staff.

Independent work under the close guidance of a faculty member selected by the student.


IV. Biological and Ecological Anthropology

285 Monkeys, Apes, and People: The Comparative Biobehavior of Primates Spring. 3 credits (4 by arrangement with instructor). T R 10:10–11:25. M. LaVeille. Humans are primates. Viewed from an ethnological and ethological perspective, humans share significant genetic, ecological, and behavioral similarities with monkeys and the great apes. This course provides an overview of primate biology and behavior as well as exploration of the role of the human language and culture, human family structure, and gender roles.

375 Ecology and Human Food Production Fall. 4 credits. T R 10:10–11:25. R. Dyson-Hudson. Humans have developed many different ways of producing the food they need to survive. They forage for wild foods, herd domestic animals, and cultivate plants. Although ecological constraints such as nutrient cycling and energy flow influence food production, there are many different ways of dealing with similar environmental problems. For example, African nomads and Western ranchers have devised quite different ways of coping with the problems of herding livestock in and environments. Each food production system has different costs and different benefits; each has different effects on the environment, different demands for human labor vs. fuel energy inputs, and different productivity of food per unit of labor per unit of land. Also, the social organization of the human groups is strongly influenced by its food production system. Guest lecturers and films will help to give a worldwide, cross-cultural perspective on the important topic of human food production.

380 Food, Feasts, and Famine: Studies in Culture and Human Nutrition Spring. 4 credits. M W F 10:10. M. LaVeille. This course explores the evolutionary history of food selection, preparation, production, and distribution, together with the biouniomedical consequences of the cultural contexts in which food plays an integral part. A large portion of the course menu is devoted to analyses of the social and semiotic aspects of foods, including religious, medical, and aesthetic ideals that influence the nutritional status of a particular society.

386 Culture and Human Disease (also Biology and Society 386) Fall. 4 credits. M W F 10:10. M. LaVeille. This course explores the interrelationships between human society and the incidence of biological illness. It focuses upon genetic and behavioral mediation of the immune system, as well as the culturally shaped epidemiology of parasitism, zoonoses, chronic disease, addiction, and diseases of undernutrition and overnutrition and aging. The format of the course is lecture-discussion with guest lectures from researchers with expertise in specific disease problems.

476 Human Nature: An Evolutionary Perspective Fall. 4 credits. Prerequisite: permission of instructor. T R 2:30–3:45. R. Dyson-Hudson. Is human nature infinitely malleable, or is our behavior constrained by evolutionary adaptations to past environments? In this course we explore the evidence for the sociobiological tenet that human behavioral as well as morphological and physiological characteristics have evolved through natural selection. The political and social implications of both extremes—environmental and genetic determinism—are discussed. General categories of behavior discussed include aggression, infanticide, territoriality, dominance and hierarchy, bonding, and sex-role differences.

V. Sociocultural Anthropology


242 American Indian Philosophies I: Power and World Views (also Rural Sociology 242) Fall. 3 credits. Enrollment limited to 20 students. T R 10–11:15. C. Saraydar. This course is designed to facilitate an understanding of the world views of American Indians of the past and present. The goal is to provoke edifying discourse that will enable American Indian beliefs concerning the working of the universe and the relationship of human beings to nature to be understood on their own terms.

243 American Indian Philosophies II: Native Voices (also Rural Sociology 243) Spring. 3 credits. Enrollment limited to 20 students. T R 10–11:15. C. Saraydar. An exploration of the diverse expressions of philosophy, to be found in the words of American Indians. Novels, political treatises, speeches, autobiographies, and other sources reflecting Indian attitudes on a variety of subjects will be examined for beauty and power of expression as well as to identify recurring themes.

301 Biology and Society I: The Biocultural Perspective (also Biological Sciences 301 and Biology and Society 301) Fall. 3 credits (4 by arrangement with instructor). Biology and Society majors are required to take the course for four credits. Prerequisite: one year of introductory biology. S-U grades optional. This is the core course requirement for the biology and society major and is also open to other students who have fulfilled the prerequisite. T R 8:40–9:55. D. J. Greenwood. In modern evolutionary theory, human biology, behavior, and institutions are understood as the ongoing products of interactions between human biological evolution and cultural change. Nevertheless, numerous attempts to examine the evolutionary processes in humans violate key tenets of evolutionary theory, unwittingly reproducing elements of pre-Darwinian views of human nature. After reviewing the pre-Darwinian context and reading The Origin of Species, the course explores attempted applications of evolutionary analysis to humans and develops a cultural explanation of the persistence of pre-Darwinian elements in many of them.

[305] Psychological Anthropology Fall. 4 credits. Not offered 1986–87.

312 The Anthropology of Medicine (also Biology and Society 312) Spring. 4 credits. Limited to 15 students. Prerequisites: Biology and Society/Biological Sciences/Anthropology 301 and permission of instructor. T 2:30–4:30. D. J. Greenwood, D. H. Holmberg. An examination of contemporary medical systems from an anthropological perspective and an evaluation of current approaches to the anthropology of medicine.

313 Anthropology of the City Spring. 4 credits. M W F 9:05. R. J. Smith. An examination of the sociocultural structure and process in urban settings, with emphasis on the role of rural migrants, the relationship of urbanism to political and economic development, the role of voluntary associations, and the adjustment of family and kinship groups to urban life. Asian, African, and Latin American urban centers are emphasized.


321 Sex and Gender in Cross-Cultural Perspective (also Women's Studies 321) Fall. 4 credits. M W F 1:25. K. S. March. An introduction to the study of sex roles cross-culturally and to anthropological and sociological approaches to gender. The course examines various aspects of the place of the
seeks in social, political, economic, ideological, and biological systems to emphasize the diversity in gender and sex-role definition around the world.

322 Magic, Myth, Science, Religion
Spring. 4 credits.
1 T R 1:25–2:15 plus 50-minute sec to be arranged.
A. T. Kirsch.
A survey of anthropological approaches to the study of religion in simple and complex societies. Examines the role of religion in addressing intrinsic strains in personal and social life and in inhibiting or inducing social and cultural change.

323 Kinship and Social Organization
Spring. 4 credits.
M W F 11:15. B. Lambert.
Much of this course is a survey of forms of the family, descent groups, and marriage systems. The role of age and sex in the social structure is also considered. The last part of the course is devoted to a history of the British and American family and to its fate in utopian communities.

325 Histories of Ideas of Exotica
Fall. 4 credits. Not offered 1986–87.

326 Economic Anthropology
Fall. 4 credits. Not offered 1986–87.

328 Law and Culture
Spring. 4 credits.
Anthropologists’ interests in the sociocultural context of human experience have shaped questions that center on the foundations of social order in human communities. People everywhere have ways of expressing and resolving conflict, although the cultural meanings of conflict and harmony differ around the world. This course examines the cross-cultural literature on interpersonal conflict and disputes, conflict resolution, and cultural constructions of accountability. We consider the role of law in these processes and the significance of access to law. Comparative discussions include ethnographic studies of modern communities in Asia, Africa, Latin America, Oceania, and the United States.

329 Power and Culture

367 American Indian Tribal Governments (also Rural Sociology 367)
Fall. 4 credits. Not offered 1986–87.

406 The Culture of Lives (also Women’s Studies 406)
Spring. 4 credits. Prerequisite: Anthropology/ Women’s Studies 321 or permission of instructor.
This seminar explores the insights provided by biographical/autobiographical accounts into both the particularities of individual lives and into the wider social and cultural forms of those lives. We will look at the place of life histories within the development of anthropology as a discipline, from the earliest explorers’ accounts through the florescence of their importance in early American ethnographic description, and into the contemporary resurgence of interest in personal narratives as windows onto both the social or cultural construction of the person and the personal construction of the social or cultural. Course materials draw heavily upon women’s lives and their representations, both to contrast women’s and men’s accounts and to underscore the special significance of women’s narratives in anthropology.

422 Special Problems in the Anthropology of Sex and Gender (also Women’s Studies 422 and Biology and Society 405)
Fall. 4 credits. Not offered 1986–87.

424 Myth, Ritual, and Sign
Fall. 4 credits. Not offered 1986–87.

427 The Anthropology of Everyday Life
Fall. 4 credits. Not offered 1986–87.

428 Spirit Possession, Shamanism, Curing, and Witchcraft (also Women’s Studies 428)

442 American Indian Philosophies: Selected Topics (also Rural Sociology 442)

451 Anthropological Boundaries
Fall. 4 credits. Not offered 1986–87.

452 Portraits, Profiles, and Life Histories

453 Visual Anthropology
Fall and spring. 4 credits. Enrollment limited. S-U grades only.
The expression of ideas about the human condition through original drawings, graphics, paintings, photographs, video, cinema, sculpture, and related media. Writing can be combined with visual expression as, for example, in concrete poetry or photographic essays. Projects must conform to two general guidelines: (1) the student must have prior knowledge of the medium chosen or concurrent course work in it; and (2) the project must be one that can be developed throughout the course and benefit from its particular setting. In the first half, anthropology is introduced through the creative work of others. For example we read Tutuola’s The Palm-Wine Drinkard, and view films made by both anthropologists and the people whom they visit. The second half is devoted to hour-long progress reports and discussions of the work of people in the course.

455 Theatre of Anthropology

VI. Theory and History of Anthropology

[408 Gender Symbolism (also Women’s Studies 408) Spring. 4 credits.
This course looks at how cultural meaning is constructed about biological sex differences. We begin from the presumption that sex difference and gender are culturally defined as a system of categories and meanings interacted with people’s cognitive, intellectual, and affective experience of their worlds. The course has two primary conceptual objectives: (1) to analyze the relations among gender symbols and (2) to explore the relations between those symbols and the social world of the people who believe in them.

412 Contemporary Anthropological Theory
Fall. 4 credits.
M W F 11:15. B. Lambert.
A survey of the assumptions anthropologists make concerning the nature of society and culture, and the explanations they have proposed for social behavior, values, belief systems, and ritual. Problems of order in society will be approached through processual analysis and the concept of production. Problems of understanding other cultures, through interpretative and structural studies of cultural logic and symbolism. Examples will be drawn from Western and non-Western societies, past and present.

414 Anthropology and History

417 Structuralism: For and Against
Spring. 4 credits.
T 2:30–4:30. J. A. Boon.
A study of the ideas of Claude Lévi-Strauss and a reading of diverse texts for and against structuralism that raise general issues in ethnology, philosophy, criticism, and comparative studies. We attempt to assess the place of Lévi-Strauss’s approach in the history of ideas and of ethnography.

420 Development of Anthropological Thought

VII. Area Courses

230 Cultures of Native North America
Fall. 4 credits.
M W 2:30. B. Lambert.
A survey of the principal Eskimo and American Indian culture areas north of Mexico. Selected cultures will be examined to bring out distinctive features of the economy, social organization, religion, and world view. Although the course concentrates on traditional cultures, some lectures and readings deal with changes in native ways of life that have occurred during the period of European-Indian contact.

318 Ethnohistory of the Iroquois (also Agriculture and Life Sciences 318)
Spring. 3 credits. (4 by arrangement with instructor.
The development of Iroquois (Hodenaouane) culture patterns is examined in depth from the prehistoric period to the present day. Changes in cultural ecology, social organization, and worldview are examined. Supplemental information is drawn from accounts of neighboring groups in southern Canada and western New England. Approximately one-third of the course is devoted to contemporary issues faced by the Iroquois people.

331 The United States
Fall. 4 credits.
How do Americans define their own culture, and how do they learn how to “be” American? This course examines central images of American identity—freedom, equality, and individualism—and explores their relationship to major social institutions: the family, the marketplace, social control, the political process, and religion. Readings combine contemporary American ethnography, popular social commentary, accounts by foreign travelers, and comparative perspectives from sociocultural anthropology, field assignments, films, and discussion supplement the readings.

333 Ethnology of the Andean Region
Spring. 4 credits.
M W F 11:15. B. J. Isbell.
Andean culture from the Inca empire to the present. Continuities and transformations of social, political, and religious structures will be considered. Special attention will be given to the current social and political situations in the region.

334 Ethnology of Island Southeast Asia
Fall. 4 credits. Not offered 1986–87.

335 Peoples and Cultures of Mainland Southeast Asia
Fall. 4 credits.
M W 1:25 plus 50-minute section to be arranged.
A. T. Kirsch.
A survey of the peoples and cultures of mainland Southeast Asia from prehistoric to contemporary times.

336 Ethnology of Oceania
Fall. 4 credits. Not offered 1986–87.

342 Culture and Societies of India, Nepal, and Sri Lanka

343 Religion, Family, and Community in China

345 Japanese Society
Fall. 4 credits.
M W F 9:05. R. J. Smith.
A survey of the social structure of Japan and a discussion of trends in urban and rural life during the past century. Topics to be social institutions (the family, ancestor worship, community and social organization, and urbanism and modernization.
401 Balinese Culture: Description and Comparison Fall. 4 credits.
T 2:30–4:30. J. A. Boon. A survey of the complex field of Balinese studies that stresses Bali’s relation to other Indonesian societies and its place in the history of so-called Hinduization. Readings range over aspects of institutions, ritual and religion, cosmology, the visual and performing arts, subsistence, ideology, and contemporary forces of markets and commercialism. Bali serves as our “culture of reference” for assessing various processes, including rationalization, cultural revivalism, and tourism.

[433 Andean Thought and Culture Spring. 4 credits. Not offered 1986–87]

[456 Mesoamerican Thought Fall. 4 credits. Not offered 1986–87]

VIII. Related Courses in Other Departments

Introduction to Archaeology (Archaeology 100)
Archaeological Research Design (Archaeology 301)
Human Biology and Evolution (Biological Sciences 275)
Contemporary European Society and Politics (History 283)
Interpersonal and Social Stress and Coping (Psychology 486 and Sociology 486)

IX. Graduate Seminars

600-level courses are open to undergraduates who have fulfilled the prerequisites or by consent of the instructor.

Southeast Asia Seminar: Vietnam (Asian Studies 601)
Southeast Asia Seminar: Burma (Asian Studies 602)

Contemporary Sociological Theories of Development (Rural Sociology 606)
607–608 Special Problems in Anthropology 607, fall; 608, spring. Credit to be arranged. Hours to be arranged. Staff.

[610 Myth and Mythology Spring. 4 credits. Not offered 1986–87]

[611 Hierarchies, Ritual, and History Spring. 4 credits. Not offered 1986–87]

612 History of Anthropological Thought Spring. 4 credits.

Methods of Assessing Physical Growth in Children (Nutritional Sciences 612)

[619 Anthropological Approaches to the Study of Buddhism in Asia Fall. 4 credits. Not offered 1986–87]

623 Himalayan Issues, Problems, and Prospects Fall. Credits to be arranged.
W 4:30–6:25. K. S. March. An advanced seminar for students committed to research and work in the Himalayas. The seminar is broadly interdisciplinary and strives for a balance between technical and theoretical issues. Specific topics depend upon participant expertise and interest in movie film. The intellectual problem is to visualize the myths of others so that they are comprehensible to us but are not thought to be of us. Reading includes introductory works on both myth and animation, and there is background reading on the particular myth that is committed to film.

656 Maya History Fall. 4 credits.
W 2:30–4:30. J. S. Henderson. A detailed consideration of the dynastic history of the ancient Maya as it is recorded in hieroglyphic inscriptions and associated art. The use of later historical and etnohagiographic information to interpret the early texts is a major focus, and emphasis is on the implications of all of these sources for reconstructing Maya social and political organization and its relationship to Maya religion.

663 Hunters, Gatherers, and the Origins of American Agriculture Fall. 4 credits. Prerequisites: Anthropology 356 or permission of instructor. Open to qualified undergraduates.
W 12:20–2:15. T. F. Lynch. The transition from hunting and gathering to agricultural subsistence, with particular attention to demographic, ecological, and coevolutionary factors. Topics to be emphasized are the history of thought on agricultural origins, archaeological evidence bearing on these theories, contrasts and conflicts between Western and non-Western systems, and the effects of agricultural instability and environmental degradation, particularly in the Americas.

664 Problems in Archaeology: “Early Man” in America Spring. 4 credits. Prerequisites: Anthropology 354. Open to qualified undergraduates.
W 12:20–2:15. T. F. Lynch. The peopling of the Western Hemisphere will be considered in historical perspective, as it has been dealt with by archaeologists, geologists, and paleoecologists. Emphasis will be on contextual analysis and environmental adaptations, as well as chronology, with topics drawn from both North and South American archaeology.

[666 The Discovery of America Fall. 4 credits. Not offered 1986–87]

Human Evolution: Concepts, History and Theory (Biological Sciences 673)

677 Topics in Ecological Anthropology Spring. 4 credits.
W 2:30–4:30. R. Dyson-Hudson. The adaptive relations between specific groups of foragers and agriculturalists, and the food-producing sectors of their habitat will be analyzed. The relation between variables of human social organization, such as settlement size, kinship relations, social stratification, and spatial organization, and features of the environment will be examined through reading current articles and monographs. Seminar will be designed to cover the specific interests of participating students.

Introduction to Ethnomusicology (Music 680)

901–902 Field Research 901, fall; 902, spring. Credit to be arranged. Hours to be arranged. Staff.

Arabic and Aramaic

See Department of Near Eastern Studies.

Archaeology

J. S. Henderson (anthropology), director; A. L. Bloom (geological sciences), R. G. Calkins (history of art), K. M. Clinton (Classics), J. E. Coleman (Classics),
to offer a separate archaeology major. Program faculty include: T. P. Kuniholm (archaeology/Classics), P. I. Kuniholm (architecture), T. P. Volman (archaeology), R. T. Fuller (English), M. Kubelik (architecture), and F. Lynch (history of art). B. S. Strauss (history), C. Morris (anthropology), G. W. Otson (agronomy), D. I. Owen (Near Eastern studies), and A. Ramage (history of art) are members of faculty from many departments, affiliated with several departments, coordinate course offerings and help students identify opportunities for fieldwork, graduate study, and professional positions.

The Major

The basic introductory course for both majors and nonmajors is Archaeology 100. This course covers the broadest range of archaeology in terms of area and time and deals with method as well as results. Those with a fairly serious interest, particularly prospective majors, are encouraged to take the optional one-hour section, Archaeology 101, which provides practical experience with archaeological materials. Archaeology 301, which considers research design, and Archaeology 302, which examines interpretive frameworks, are especially recommended for majors. Since the major draws upon the teaching and research interests of faculty from many departments in order to present a broad view of the archaeological process, a student interested in the archaeology major should discuss his or her course of study with a participating faculty member as early as possible. In some areas of specialization, intensive language training should be coordinated with other studies as early as the freshman year.

As prerequisite to the major a student must complete Archaeology 100. Once admitted to the major, the student must take an additional 36 credits in courses from the archaeology list, chosen in consultation with the major adviser. These courses should provide exposure to a broad range of archaeologically known cultures and the methods of revealing and interpreting them. They must be distributed as follows:

1. At least two courses from each of the categories below (totalling at least 36 credits, including 16 at the 300 level or above):
   - Theory and Interdisciplinary Approaches (B)
   - Old World Archaeology (C)
   - New World Archaeology (D)
   - At least two related courses (list available in Archaeology Program office)

Honors: Honors in archaeology is awarded on the basis of the quality of an honors essay and the student's overall academic record. Candidates for the honors program should consult with the director of undergraduate studies before the beginning of the senior year. The honors essay is normally prepared in consultation with a faculty adviser during the senior year; students may enroll in Archaeology 300 for this purpose.

Fieldwork: Every student should gain some practical experience in archaeological fieldwork on a project authorized by the major adviser. This requirement may be waived in exceptional circumstances. The Jacob and Hedwig Hirsch bequest provides support for a limited number of students to work at excavations sponsored by Cornell and other approved institutions.

The Concentration

Students in Cornell schools and colleges other than Arts and Sciences may elect a concentration in archaeology. To concentrate in archaeology, the student must complete Archaeology 100 with a grade of C or better and at least four advanced courses in archaeology, distributed among the three groups stipulated in (1) in the description of the major, above.

Concentrations are eligible for Hirsch Scholarships in support of fieldwork.

Freshman Seminars

For course descriptions see the Freshman Seminar brochure.

Freshman Seminar in Classical Archaeology (Classics 121) Fall or spring.

A. Introductory Courses and Independent Study Courses

101 Introduction to Archaeology

Spring

3 credits

MWF 1:25; 2 evening prelims. T. P. Volman. A broad introduction to archaeology—the study of material remains to answer questions about the human past. The history, methods, and interpretive frameworks of archaeology are presented, followed by a survey of the archaeological record from human origins, through the development of food production, to the rise and spread of civilizations. Guest lecturers by members of the Cornell Archaeology Program are an integral part of the course.

102 Archaeological Research Methods

Spring

1 credit

Limited to 35 students. Optional section to be taken concurrently with Archaeology 100. Prospective archaeology majors are encouraged to participate in this section, although it is open to all interested students.

B. Theory and Interdisciplinary Approaches

203 Early People: The Archaeological and Fossil Record (also Anthropology 203)

Fall

3 credits

T R 1–2:15. T. P. Volman.

A survey of the archaeological and fossil record of human evolution. Contributions by researchers from a variety of disciplines are highlighted, as are the discoveries, personalities, and controversies that have enriched the study of human evolution for more than a century. Critical evaluation of evidence and interpretations will be stressed. Demonstrations and films supplement the lectures.

301 Archaeological Research Design

Fall

4 credits

Prerequisite: permission of instructor.


Archaeological practice demands careful definition of research objectives and appropriate strategies before excavation or other fieldwork begins. Critical information lies in the arrangement and associations of objects and structures; this context should be a basic concern of any field investigation, particularly when it is destroyed by excavation. The course relies on case studies to illustrate how surveys, excavations, and analytical techniques must be tailored to solving specific problems. An undergraduate seminar especially recommended for archaeology majors but open to anyone with a serious interest in archaeology.

302 Approaches to Archaeology

Fall

4 credits

Prerequisite: permission of instructor.

T. P. Volman, J. S. Henderson.

An exploration of the concepts that have shaped modern archaeology. The course briefly examines the history of theoretical orientations in archaeology that considers the variety of perspectives and interpretive frameworks that guide present-day investigations.

Case studies illustrate the implications of the nature of the archaeological record for reconstructing subsistence and economic systems, trade, social and political organization, demography, and ideology. An undergraduate seminar especially recommended for archaeology majors but open to anyone with a serious interest in archaeology.

308 Dendrochronology of the Aegean (also Classics 309)

Fall or spring. 4 credits. Limited to 10 students. Prerequisites: Archaeology 100 or Classics 220, and permission of instructor.

MWF 12:55–1:45; two labs to be arranged.

T. P. Kuniholm

Participation in a research project of dating modern and ancient tree-ring samples from the Aegean and Mediterranean. Supervised reading and laboratory work. A possibility exists for summer fieldwork in Greece or Turkey.

317 Stone Age Archaeology

Fall

4 credits.

R 2:30–4:25. T. P. Volman.

A survey of current approaches to the archaeological record of Stone Age peoples, from the earliest sites to those of recent times. Case studies are used to illustrate the nature of archaeological occurrences, excavation procedures, and analytical methods. Multidisciplinary efforts to expand our knowledge of prehistoric lifeways and behaviors are a major concern of the course.

356 Field Methods in Archaeology (also Classics 356)

Spring

4 credits.

Prerequisite: one course in archaeology

T R 2:30–3:45 plus lab to be arranged. J. Coleman.

Methods and techniques of archaeological survey and excavations and the study and recording of artifacts. The theoretical foundations will be considered as well as a wide variety of illustrative issues and problems. Special emphasis on the Mediterranean. Recommended for students who want to participate in the Cornell field project at Haia in Greece in summer 1987.

Archaeological Research Methods (Anthropology 358)


Ancient Societies (Anthropology 216)

Fall.


Interpretation of the Archaeological Record (Anthropology 352)

Fall.


Investigation of Andean Institutions: Archaeological Strategies (Anthropology 435)

Fall.


Seminar in Archaeology (Anthropology 493)

Fall.


Seminar in Archaeology (Anthropology 494)

Spring.


Hunters, Gatherers, and the Origins of American Agriculture (Anthropology 663)

Fall.

4 credits.

Prerequisite: Anthropology 356 or permission of instructor. Open to qualified undergraduates.


The transition from hunting and gathering to agricultural subsistence, with particular attention to demographic, ecological, and evolutionary factors. Topics to be emphasized are the history of thought on agricultural origins, archaeological evidence bearing on these theories, contrasts and conflicts between Western and non-Western systems, and the effects of agricultural instability and environmental degradation, particularly in the Americas.

Problems in Archaeology: “Early Man” in America (Anthropology 664)

Spring.

4 credits.

Prerequisite: Anthropology 354. Open to qualified undergraduates.


The peopling of the Western Hemisphere will be considered in historical perspective as it has been
dealt with by archaeologists, geologists, and paleoecologists. Emphasis will be on contextual analysis and environmental adaptations, as well as chronology, with topics drawn from both North and South American archaeology.

Geomorphology (Geological Sciences 345) Fall. 4 credits. Prerequisite: Geology 102 or 201, or permission of instructor. T R 9:40–10:55; lab. T 2–4:30. L. Bloom. Origin of landforms and description in terms of structure, process, and stage.

[Ceramics (History of Art 423) Not offered 1986–87]

[Seminar in Methods of Art History (History of Art 595) Spring. 4 credits. Not offered 1986–87]

C. Old World Archaeology


Seminar in the Architecture of the Classical World (Architecture 681) Fall or spring. 4 credits. Prerequisite: Architecture 361 or permission of instructor. Hours to be arranged. M. Kubelik. Issues in Greek and Roman architectural history. Specific topic to be announced.

Mediterranean Archaeology (Classics 219 and Near Eastern Studies 267) Fall. 3 credits. T R 10:10–11:25. J. Coleman. An examination of the architectural bases of ancient Mediterranean civilization with special focus on contacts and interrelationships in the Bronze Age (ca. 3500–1100 B.C.). Topics include the Neolithic of Anatolia, Greece, and the Near East, the rise of civilization in Egypt; the Bronze Age states of Syria-Palestine (Ebla, Ugarit, Byblos, etc.); Cyprus, copper, and the Alasia question; the Hittites and Bronze Age Anatolia; the early Bronze Age in Greece; Minoans, Mycenaeans, and their eastern and western contacts; the Bronze Age in the western Mediterranean; and ancient ships and trade in the late Bronze Age.

[Minoan-Mycenaean Art and Archaeology (Classics 221 and History of Art 221) Fall. 3 credits. Not offered 1986–87]

[Archaeology in Action I (Classics 322) Fall. Not offered 1986–87]

233 Archaeology in Action II (also Classics 323) Spring. 3 credits. Prerequisites: Archaeology 100 or Classics 220, and permission of instructor. M 2:30-4:25; two labs to be arranged. P. L. Kuniholm. Objects from the Classical, Hellenistic, and Roman periods are "dug" out of Cornell basements, identified, cleaned, restored, cataloged, and photographed and are considered in their appropriate historic, artistic, and cultural contexts.

Greek and Roman Mystery Religions (Classics 237) Spring. 3 credits. M W T 11:15-12:05. D. Deason. The development and character of Mystery cults from the original Mystery of Demeter and Persephone to the Christian Mysteries. The cults include the Kabiri, the Great Gods of Samothrace, Dionysus, Osiris, and other cults of Asia Minor and the Near East. Investigation will focus on the distinctive features of the Mystery cults that contributed to their success.

[Arts and Monuments of Athens (Classics 320 and History of Art 320) Spring. 4 credits. Prerequisite: Classics 220 or permission of instructor. Not offered 1986–87]

[Archaeology of Cyprus (Classics 321 and History of Art 321) Not offered 1986–87]

[Greek Architecture (Classics 328) Not offered 1986–87]

[Greek Sculpture (Classics 329 and History of Art 329) Not offered 1986–87]

[Research Questions in Mediterranean Archaeology (Classics 450) Not offered 1986–87]

Graduate Seminar in Bronze Age Archaeology (Classics 629) Fall. T 1:25–4:25. J. Coleman.

[Seminar in Classical Greek Archaeology: Graduate (Classics 630) Fall. 4 credits. Not offered 1986–87]

Ancient Greece from Homer to Alexander the Great (History 265) 4 credits. Fall. M W 11:15; disc T 12:20 or 2:30. B. Strauss. A survey of Greece from the earliest times to the end of the Classical period in the late fourth century B.C. The course focuses on the Greek genius: its causes, its greatness, its defects, and its legacy. The Heroic Age, the city-state, ancient democracy, and the intellectual ferment of the Greek Enlightenment are the main topics of study. Readings in translation from Homer, Aristophanes, Sophocles, Herodotus, Thucydides, Plato, and Aristotle and from the evidence of ancient inscriptions, coins, art, and architecture.

The Art of the Classical World (History of Art 220 and Classics 220) Spring. 3 credits. A. Ramage. The sculpture, vase painting, and architecture of the ancient Greeks, from the Geometric period through the Hellenistic, and the art of the Romans from the early Republic to the late Empire.

Arts of the Roman Empire (History of Art 322) Fall. 4 credits. M W F 9:05. A. Ramage. The visual arts in the service of the first world state. The course starts with the Republican and Roman period but concentrates on monuments of the imperial era in Italy and the provinces until the time of Constantine.

[Painting in the Greek and Roman World (History of Art 323 and Classics 323) Not offered 1986–87]

[Greek Vase Painting (History of Art 325) Not offered 1986–87]

[Greek and Roman Coins (History of Art 327 and Classics 327) Not offered 1986–87]

Greeks and Their Eastern Neighbors (History of Art 328 and Classics 322) Fall. 4 credits. M W F 12:20. A. Ramage. A study of the archaeological and historical evidence for the interaction between Greek civilization and the eastern and western Mediterranean from the thirteenth to the fourth centuries B.C. The course will focus on Greek relationships with Anatolia, the Levant, and Egypt, as well as with Italy in the Iron Age.

[Architecture of the Middle Ages (History of Art 322 and Architecture 382) Spring. 4 credits. Not offered 1986–87]

[Seminar in Greek Sculpture (History of Art 431) Not offered 1986–87]

[Sardinia and the Cities of Asia Minor (History of Art 432 and Classics 432) Spring. 4 credits. A. Ramage, P. Kuniholm. The growth and interaction of the Greek and Roman cities and their art will be studied using the finds and conclusions from the Cornell-Harvard excavations at Sardis as a focal point. The magnificent works of art and architecture will be set beside domestic remains and objects of daily life. We will examine local themes in the context of the history, topography, and the larger political and economic scene in Asia Minor. Topics will range over a long period, from the Late Bronze Age to the Early Byzantine era.
D. New World Archaeology

[361 Field Archaeology in South America (also Anthropology 361) Spring. 10 credits. Prerequisite: permission of instructor. Not offered 1986–87.]

Hours to be arranged (off campus in Chile).
T. F. Lynch.

Participation in archaeological survey, excavation, and laboratory work in the Atacama desert, puna, and precordillera of northern Chile. This practical training session is part of a collaborative program with Chilean universities, serving equal numbers of Chilean and North American students (eight). Research will focus on late glacial hunting and gathering adaptation to a present-day desert environment and its reconstruction, and the development of institutionalized economic complementarity, and excavation of an Inka tambo (way station). Students will learn diverse archaeological field methods by taking part in a regional research project.

The Peopling of America (Anthropology 354) Fall. 4 credits.

Prehistoric discovery of the New World, beginning with American Indian origins in Asia and ending with the largely unrecorded European medieval contact with North America. Major topics include crossing the Bering land bridge, big-game hunting and extinctions, postglacial adaptations to changing environments, diversified subsistence in the eastern woodlands, agricultural civilizations of the Midwest and Southwest, and Eskimo and Native exploration and settlement across the Arctic and North Atlantic.

Archaeology of Mexico and Central America (Anthropology 355) Spring. 4 credits.
A survey of the societies of ancient Mexico and Central America, emphasizing the Aztec and Maya civilizations. The use of ethnographic and historical information to enrich archaeological interpretation is a general theme. Specific topics include the emergence of settled farming life, the development of civilization, and trade and other forms of interaction among the many societies in the area.

The Archaeology of South America (Anthropology 356) Spring. 4 credits.
Origins and development of South American agriculture and civilization, with special attention to Peru, the Andean highlands, and diffusion into the lowland forests and Caribbean. Major topics include the domestication of plants and animals, the rise of temple-based cults and great art styles, the formation of militaristic states, regional interaction and the Inca empire, and the possibility of transoceanic influences.

Mesoamerican Thought (Anthropology 456) Fall. 4 credits. Not offered 1986–87.

Maya History (Anthropology 656) Fall. 4 credits.
A detailed consideration of the dynastic history of the ancient Maya as it is recorded in hieroglyphic inscriptions and associated art. The use of later historical and ethnohistoric information to interpret the early texts is a major focus, and emphasis is on the implications of all of these sources for reconstructing Maya social and political organization and its relationship to Maya religion.

[The Discovery of America (Anthropology 666) Not offered 1986–87]

Asian Studies:

B. debay, chairperson and director of undergraduate studies (398 Rockefeller Hall, 255–5056).


The Department of Asian Studies encompasses the geographical areas of East Asia, South Asia, and Southeast Asia and offers courses in most of the disciplines of the social sciences and the humanities. Asian studies courses through the 400 level are taught in English and are open to all students in the University. Some of these courses may be counted toward majors in other departments; others fulfill the humanities distribution requirement.

Distribution Requirement

Humanities: any two courses in Asian art, literature, or religion given by the Department of Asian Studies or listed there under the areas of China, Japan, South Asia, and Southeast Asia, excluding only Freshman Seminars and courses given outside the College of Arts and Sciences. A reasonable sequence is formed by taking any two courses in the same area. Alternative sequences will, under special circumstances, be considered and require the permission of the director of undergraduate studies. Any two of the following three 200-level courses form a sequence that satisfies the humanities distribution requirement: Asian Studies 211, 212, and 215.

Social Sciences: any two courses in Asian anthropology, economics, government, linguistics, or sociology given by the Department of Asian Studies or listed there under the areas of China, Japan, South Asia, and Southeast Asia, excluding only Freshman Seminars and courses given outside the College of Arts and Sciences. A reasonable sequence is formed by taking any two courses in the same area. Alternative sequences will, under special circumstances, be considered but require the permission of the director of undergraduate studies.

History: any two courses in Asian history given by the Department of History and listed under the Department of Asian Studies under the areas of China, Japan, South Asia, and Southeast Asia, excluding only Freshman Seminars and courses given outside the College of Arts and Sciences. A reasonable sequence is formed by taking any two courses in the same area. Alternative sequences will, under special circumstances, be considered but require the permission of the director of undergraduate studies.

The Major

The applicant for admission to the major in Asian studies must have completed at least one area studies course selected from among those listed under the Department of Asian Studies and must receive permission for admission to the major from the director of undergraduate studies. The student must have received a minimum of C- in this course and in all other courses counted toward the major.

A student majoring in Asian studies is required to complete two courses at the 200 level (a minimum of 6 credits with a grade of C or better) in one of the Asian languages offered at Cornell. The major consists of at least 30 additional credits (which may include up to 6 credits of further language study) selected by the student in consultation with his or her adviser from among the courses listed under the Department of Asian Studies and numbered 300 and above. Majors in Asian studies normally specialize in the language and culture of one country and often choose an additional major in a traditional discipline.

Honors.

To be eligible for honors in Asian studies, a student must have a cumulative grade average of B+ in all Asian studies courses and must successfully complete an honors essay during the senior year. Students who wish to be considered for honors should apply to the director of undergraduate studies during the second term of their junior year. The application must include an outline of the proposed project and the endorsement of a faculty adviser. During the first term of the senior year the student does research for the essay in conjunction with an appropriate Asian studies course or Asian Studies 401. Students of China and Japan must also complete Asian Studies 611. By the end of the fall term the student must present a detailed outline of the honors essay and have it approved by the faculty sponsor and the director of undergraduate studies. The student is then eligible for Asian Studies 402, the honors course, which entails writing the essay.

At the end of the senior year, the student has an oral examination (with at least two faculty members) covering both the honors essay and the student's area of concentration.

Concentration in Southeast Asia Studies

A candidate for the Bachelor of Arts or Bachelor of Science degree at Cornell may take a concentration in Southeast Asia studies by completing 15 credits of course work, including a history course and three courses from seminars at the intermediate or advanced level, two of which may be Southeast Asian language courses. Students taking a concentration in Southeast Asia studies are members of the Southeast Asia Program and are assigned an adviser from the program faculty. Such students are encouraged to commence work on a Southeast Asian language and to take advantage of summer intensive language training.

Intensive Language Program (FALCON)

For those students desiring to accelerate their acquisition of Chinese, Japanese, or Indonesian, Cornell offers a full-time intensive language program, the Full-Year Asian Language Concentration (FALCON). FALCON students spend six hours a day, five days a week, for periods of up to a full year studying only the language and thus are able to complete as many as twelve hundred hours of supervised classroom and laboratory work in one year. For further information, students should contact the FALCON Program Office, Department of Modern Languages and Linguistics, 203 Morrill Hall (telephone: 607/255-6457).

Study Abroad

Cornell participates in the Inter-University Program in Chinese Language Studies, offers an intensive language program, and offers a full-time language study program in Beijing. Cornell is also an affiliated institution of the Council on International Educational Exchange, which offers intensive language training at Beijing University and language and area studies at Nanjing and Fudan universities.

Cornell is a class A member of the American Institute of Indian Studies, which offers fellowships in India for intensive language study in Hindi, Bengali, and Tamil. For further details contact the South Asia Program office, 170 Uris Hall (telephone: 255-8933).

Freshman Seminars

[101 Women and Social Transitions in the Twentieth Century Fall. 3 credits. Not offered 1986–87]

[103 Revolutions and Social Values in Modern Chinese Literature Spring. 3 credits. Not offered 1986–87 E. M. Gunn]
104 Three Ways of Thought Fall. 3 credits. T R 12:20. C. Lupke.
An introduction to Confucianism, Taoism, and Zen through reading and discussion of basic texts.

105 Feminine and Masculine Ideals in Japanese Culture (also Women's Studies 105) Fall or spring. 3 credits. M.W. F 10:10. Staff.
In its long history, Japanese culture has developed a large number of role-models—the aristocrat, poet-priest, warrior, entertainer, "salary man," and "education mama"—and idealized them in its literature and art. Using these ideals as its subject matter, the seminar will give students practice in reading texts closely, analyzing ideas, and writing various types of papers. Through studying Japanese concepts of femininity and masculinity, the students will not only explore a new culture but will also gain new perspectives on their own cultures.


[111] Perspectives on South Asia Fall. 3 credits. Not offered 1986–87. Staff.


Related Freshman Seminars in Other Departments


General Education Courses

211 Introduction to Japan Fall. 3 credits. M W 11:15; disc, R 2:30 or 3:35, or F 10:10 or 11:15. K. Brazell.
An interdisciplinary introduction to Japanese culture especially designed for students not majoring in Asian studies. The first part of the course focuses on traditional aspects of Japanese culture that are still important today, while the second part analyzes contemporary society from a variety of perspectives. Guest lecturers from five or six departments speak on their areas of expertise.

212 Introduction to China Spring. 3 credits. (4 credits with a special project; consult instructor for information.) T R 12:25; disc, R 2:30, F 10:10, or F 11:15. E. M. Gunn and staff.
An interdisciplinary introduction to Chinese culture especially designed for students not majoring in Asian studies.

215 Introduction to South Asian Civilization Spring. 3 credits (4 credits with a special project; consult instructor for information.) M W 11:15; disc, F 11:15. D. Gold and staff.
A general introduction to the civilizations of South Asia designed for nonmajors. Faculty members from several departments will focus on integrative themes in the study of South Asia: ethnic and linguistic diversity, tradition, and change. The course will provide an introduction to the geography, arts, religions, and history of India, as well as to those of other modern states of South Asia that share its cultural heritage.

Asia—Literature and Religion Courses

The following courses are taught entirely in English and are open to any Cornell student.

250 Introduction to Asian Religions Fall. 3 credits. T R 10:10–11:25. B. Faure.
A general introduction to the major religions of Asia (Hinduism, Buddhism, Taoism, and Shinto), their local interaction, and their impact on the cultures of India, China, and Japan. Based on readings of English translations of the canonical texts (Bhagavad-Gita, Dhammapada, Lotus Sutra, Tao-te ching, Kojiki), discussion will stress the relationships between the symbolic and mythological systems, as well as the rituals and the contemplative practices of each tradition. Two guided papers.


310 Readings in Korean Literature Spring. 3 credits. W 7:30 p.m. D. R. McCann.
A survey of works of literature most notably exemplifying the Korean cultural identity. Premodern works will include The Song of Ch'oyong, The Story of Chunhyang, and selected kaya and sijo poems. Modern works will include both poetry and fiction. A principal theme to be considered will be the nature of the Korean past and present, and the individual writer's relationship to them.

313 The Japanese Film Spring. 4 credits. One optional film viewing M 4:30, one required viewing W 4:30; lec, W 11:15; disc, M or F 11:15. B. deBar.
After an introduction to methods of film analysis, the course presents a sequence of ten films by noted Japanese directors. The aim of the course is twofold: to enhance appreciation of the films as an art form and to use the formal analysis of films to yield insights into Japanese society and culture. Particular attention is given to areas in which Japanese film, influenced by traditional arts and aesthetic principles, has resisted Hollywood editing codes.


351 The Religious Traditions of India Fall. 4 credits. M W 2:30. D. Gold.
A study of the relationships between the main currents of Indian religion. The course will focus on the Hindu tradition and its holistic worldview within the context of the caste system. It will then describe the rise of Jainism and Theravada and Mahayana Buddhism, as well as Hindu and Buddhist Tantrism, as religious phenomena reflecting the emergence of individualism.

This course will focus on the expansion of Mahayana Buddhism in East Asia and its impact on the cultures of China, Korea, and Japan. It will examine the integrative or subversive role played by various trends of Mahayana Buddhism, the interaction between its official and popular components, and its adaptation to the local contexts. Two guided papers.

355 Japanese Religions Fall. 4 credits. T R 2:30–3:45. B. Faure.
A historical and phenomenological approach to the Japanese religious traditions with an emphasis on a system of interaction, in order to attempt to establish the form of the major forces that have shaped Japanese culture.


Readings in English translation of Confucian, Taoist, and Buddhist works.


A survey of the principle works in English translation, the course introduces fiction, drama, essay, and poetry of China beginning with the Republican era and continuing up to the present in the People's Republic and Taiwan, with attention to social and political issues and literary theory. One session each week will be devoted to discussion.

Selected works in classical Chinese fiction are read in translation. Major novels, such as the Dream of the Red Chamber and Walter Margin, are emphasized.


376 Modern Japanese Literature Fall. 4 credits. M W 11:15. B. deBar.
The course examines developments in Japanese literature from the Meiji restoration (1868) onward. Topics will include the interaction of popular and "pure" literature, the Edo revival of the 1890s, the social context of the Meiji psychological novel, poetry and prose by women writers, the modernist and proletarian literature movements, writings of Hiroshima and Nagasaki, and the postwar vision of Ishimure, Morisaki, Mishima, Oe, and others. Special attention will be given to the revision of modern Japanese literary history recently articulated by Japanese postmodern critics.

The major narratives from the Tale of Genji to Saikaku are studied in translation.


386 Folk Literature of East Asia Spring. 4 credits. Not offered 1986–87.

388 Asian-American Literature Spring. 3 credits. Hours to be arranged. Staff. A study of the Asian-American experience and identity, based on the writings of Frank Chin, Lawson Inada, John Okada, Richard Kim, and Maxine Hong Kingston. The major narratives from the Tale of Genji to Saikaku are studied in translation.

295 Women in Revolution (also Women's Studies 395) Spring. 4 credits. M. Silverberg, Melion Fellow. Hours to be arranged. Staff. A study of the Asian-American experience and identity, based on the writings of Frank Chin, Lawson Inada, John Okada, Richard Kim, and Maxine Hong Kingston. The major narratives from the Tale of Genji to Saikaku are studied in translation.

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400 The Japanese No Theater and Modern Dramatists (also Comparative Literature 400) Fall. 4 credits.
M W 2:30-4. K. Brazell.
Several weeks will be spent studying the literary, performance, and aesthetic aspects of the no theater. Emphasis will be on noh as a performance system, a total theater in which music, dance, text, costume, and ritual interact to create the total effect. Then attention will turn to modern theater people who have reacted to noh in some creative way. Choice of dramatists will depend partly on student interests but will probably include Katsuo, Brecht, Britten, Claudel, Grofovski, and Mishima. All readings may be done in English translation.

450 Thailand: A Buddhist Society Summer. 4-5 credits (5 credits with research paper). Prerequisite: permission of instructor.
M F 9-12. T. Chaloemitiarana.
Summer study in Thailand. This in-country English-language seminar is designed specifically for a group of twelve to fourteen undergraduates interested in Buddhism or Southeast Asia. Offered through the Division of Summer Session, Extramural Study, and Related Programs. A few weeks will be free for library work and cultural exploration. Weekends will be spent on field trips to temples, monasteries, museums, archaeological remains, palaces, and minority ethnic communities. Opportunities will also be provided for attending cultural performances such as theater, dance, and music. All students will be required to prepare every day a two-page summary of the readings assigned for the following day, raising pertinent questions for classroom discussion. Grading will be based on these short papers and on classroom participation. A final research paper is optional. Contact the Southeast Asia Program, 120 Uris Hall (telephone: 255-2378), for more information about the topic for summer study.

454 Rural Women in Resistance and Development in the Third World Spring. 4 credits.
Hours to be arranged. Visiting professor C. White. This course will focus on rural women's responses (organized opposition, unorganized everyday resistance, community-based development) to both internal and international development policies and programs. Primary case studies will be Malaysia and Vietnam, but substantial comparative material from China, Africa, and Latin America will also be used.

457 Human and Divine Beings Fall. 4 credits.
Human beings usually perceive the divine as something beyond their limited natures but can only imagine it through forms that they know. Often these forms take shape as a personality manifesting both human and divine aspects. In this course we will examine the tensions, contradictions, and ambiguities between the human and divine aspects of different types of personal gods and holy persons. How do these personalities work as foci for tradition? What do they mean for religious life? To answer these questions we will read both secondary works giving interpretive perspectives and passages from liturgical, poetic, and narrative texts. The course will begin with lectures using examples from India to contrast problems of tradition presented by different types of human and divine beings. These examples will provide some continuity for a cycle of cross-cultural study in which students increasingly participate. Two oral presentations will be required: one toward the middle of the class, giving a clear outline of some relevant material, another toward the end, putting the same material in comparative or theoretical perspective. Hopefully, class discussion will provide input into a final paper. Final grades will be based on the paper, which should be about fifteen pages; the formal presentations; and class participation.

493 Tradition and Change in Modern India Fall. 4 credits.
Hours to be arranged. A. Gold.
We will examine selected aspects of twentieth-century Indian society and culture with a focus on understanding historical continuities and the processual transformation of tradition. Topics to be explored include concepts of family, gender, life cycles, and life stages in modern settings; urban Hinduism (temple worship, sect affiliation, healing, astrology, pilgrimage); values of self-discipline, nonviolence, and social responsibility with particular reference to Gandhi, and environmental issues in relation to human authorities and divine sanctions. Requirements: active participation in discussions of readings, a research paper, and an oral presentation.

494 Ethnicity of Malgudi: Fieldwork in the Fiction of R. K. Narayan Spring. 4 credits.
Hours to be arranged. A. Gold.
The anthropology of fiction can develop both cultural and literary sensitivities. For India a rich fictional field exists in the works of R. K. Narayan, who has created in the town of Malgudi a diverse social universe containing many of the ironies and difficulties of modern life within an ancient civilization. Students will read a series of novels and short stories, all set in Malgudi, and keep field diaries as if they were ethnographers living there and observing events. Field reports will be turned in every few weeks. Eventually each student will focus on one aspect of Malgudi's culture—religion, economics, hierarchy, kinship, or another area—and write a monographic report drawing from their "field" notes and analyses and analyze their selected topic. Some insight into the techniques of anthropological fieldwork, an appreciation for one of India's major novelists, and cultural knowledge should be their achievements.

496 Politics and Culture in Modern Japan Fall. 4 credits.
T 2:30-4. M. Silverberg.
This seminar will challenge the all-too-common misconception that "Japanese culture" can explain Japanese history as it traces three major transformations in Japanese history during the Meiji (1860–1912), Taisho (1912–1926), and Showa (1926–1989) eras: (1) the consolidation of the Meiji nation-state by the ideology and institutions of "civilization," (2) the simultaneous emergence of organized mass protest and mass culture during the Taisho years, and (3) the reconstitution of Showa politics and culture as revealed in conflicting theories of history. Some of the topics to be explored within this schema of civilization/culture/history will be the creation of tradition, working alternatives to the middle-class culture, Japanese Marxism as Western Marxism, the politics of acting like a woman, everyday life between the wars, and questioning modernity. Recent works in European and American social and intellectual history and anthropology will provide conceptual categories for the analysis of novels, memoirs, theoretical treatises, magazine advertisements, and photographs as we construct a sociocultural history of modern Japan. No Japanese language required.
Note: For complete descriptions of courses numbered 600 or above, consult the graduate faculty representative.

601 Southeast Asia Seminar: Vietnam Fall. 4 credits.
Hours to be arranged. Visiting professor C. White.

602 Southeast Asia Seminar: Burma Spring. 4 credits.
Hours to be arranged. Visiting professor Khim Maung Kyi.
[604 Southeast Asia Seminar Not offered 1986–1987]

607–608 The Plural Society Revisited (also Government 653) Fall. 4 credits. 607 may be taken independently for credit; 607 is a prerequisite for 608 [608 not offered 1986–1987]
Hours to be arranged. B. Anderson.

611 Chinese and Japanese Bibliography and Methodology Chinese, Fall; Japanese, Spring 1 credit. Prerequisite: permission of instructor. Required of honors students and M.A. candidates. F 1:25. Min-Chih Chou.

621 Seminar on South Asia: Agrarian Change in South Asia: Politics, Society, and Culture (also Government 651) Fall. 4 credits
W 2:30–5. N. Uphoff, B. Derr. An interdisciplinary examination of the sources and consequences of change in rural societies, particularly India, Nepal, and Sri Lanka. The alternatives of party and nonparty political systems, of efforts to change social relations (like caste) or to accommodate them, and of importing Western attitudes and values versus defending Asian ones will be considered. Some attention will be given to economic and agricultural matters, but they will not be the main focus of the course.

650 Seminar on Asian Religions Spring 2–4 credits. Prerequisite: permission of instructor. Hours to be arranged. B. Faure.

676 Southeast Asia Research Training Seminar Contact the Southeast Asia Program, 120 Uris Hall, 255-2378, for more information.

701–702 Seminar in East Asian Literature Fall, 701; Spring, 702, Spring 1–4 credits.
Hours to be arranged. Staff.

703–704 Directed Research For additional courses on Asian religion, see "Related Courses" in the China and Japan area courses listing.

Asia—General Courses

401 Asian Studies Honors Course Fall. 4 credits. Intended for seniors who have been admitted to the honors program.
Staff Supervised reading and research on the problem selected for honors work.

402 Asian Studies Honors: Senior Essay Fall or Spring. 4 credits. Prerequisite: admission to the honors program. The student, under faculty direction, prepares an honors essay.

403–404 Asian Studies Supervised Reading Fall, Spring, or both. Credit to be arranged. Prerequisite: permission of instructor. Open to majors and other qualified students. Intensive reading under the direction of a member of the staff.

605–606 Master of Arts Seminar in East Asian Studies

605, Fall; 606, Spring 2–4 credits. Hours to be arranged. Staff.

703–704 Directed Research 703, Fall or Spring; 704, Fall or Spring. Credit to be arranged. Staff.

Related Courses in Other Departments

[Meaning across Cultures (Anthropology 220) Not offered 1986–87]

Anthropology of the City (Anthropology 313)

[Histories of Ideas of Exotica (Anthropology 325) Not offered 1986–87]
<table>
<thead>
<tr>
<th>Course Title</th>
<th>Course Code</th>
<th>Offered 1986-87</th>
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<tbody>
<tr>
<td>Intermediate Chinese (Chinese 201-202)</td>
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<tr>
<td>Intermediate Cantonese (Chinese 211-212)</td>
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<td>Advanced Chinese (Chinese 301-302)</td>
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<td>Chinese Conversation (Chinese 303-304)</td>
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<tr>
<td>Advanced Cantonese (Chinese 311-312)</td>
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<tr>
<td>History of the Chinese Language (Chinese 401)</td>
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<td>Linguistic Structure of Chinese I (Chinese 403)</td>
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<td>Linguistic Structure of Chinese II (Chinese 404)</td>
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<tr>
<td>Chinese Dialects (Chinese 405)</td>
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<tr>
<td>Readings in Modern Chinese (Chinese 411-412)</td>
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<tr>
<td>Chinese Reading Tutorials (Chinese 413-414)</td>
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<tr>
<td>Chinese Dialect Seminar (Chinese 607)</td>
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<tr>
<td>China—Literature Courses</td>
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<tr>
<td>Introduction to Classical Chinese (Chinese 213-214)</td>
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<tr>
<td>Classical Narrative Texts (Chinese 314)</td>
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<tr>
<td>Readings in Modern Chinese Literature (Chinese 411-412)</td>
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<tr>
<td>T'ang and Sung Poetry (Chinese 420)</td>
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<td>Directed Study (Chinese 421-422)</td>
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<tr>
<td>Readings in Literary Criticism (Chinese 424)</td>
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<td>Readings in Folk Literature (Chinese 430)</td>
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<tr>
<td>Seminar in Chinese Poetry and Poetics (Chinese 603)</td>
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<td>Seminar in Folk Literature (Chinese 609)</td>
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<tr>
<td>Advanced Directed Reading (Chinese 621-622)</td>
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<tr>
<td>Japan—Area Courses</td>
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<tr>
<td>Japanese Society (Anthropology 345)</td>
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<tr>
<td>Japanese Ethnology (Anthropology 645)</td>
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<tr>
<td>Politics in Contemporary Japan (Government 346)</td>
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<tr>
<td>[Politics of Productivity: Germany and Japan (Government 430) Not offered 1986-87]</td>
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<tr>
<td>[Politics of China (Government 645) Not offered 1986-87]</td>
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<tr>
<td>[Readings from Mao Zedong (Government 651) Not offered 1986-87]</td>
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<tr>
<td>[China and the West before Imperialism (History 193) Not offered 1986-87]</td>
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<tr>
<td>[Early Warfare, East and West (History 360) Not offered 1986-87]</td>
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<tr>
<td>[History of China up to Modern Times (History 393) Not offered 1986-87]</td>
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<tr>
<td>History of China in Modern Times (History 394)</td>
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<tr>
<td>Undergraduate Seminar in Medieval Chinese History (History 492)</td>
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<tr>
<td>Self and Society in Late Imperial and Twentieth-Century China (History 493)</td>
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<tr>
<td>[Art and Society in Modern China (History 499) Not offered 1986-87]</td>
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<tr>
<td>Chinese Historiography and Source Materials (History 691)</td>
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<tr>
<td>Problems in Modern Chinese History (History 693-694)</td>
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<tr>
<td>[Seminar in Medieval Chinese History (History 791-792) Not offered 1986-87]</td>
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<tr>
<td>Seminar in Modern Chinese History (History 793-794)</td>
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<tr>
<td>[Introduction to the Arts of China (History of Art 380) Not offered 1986-87]</td>
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<tr>
<td>[The Arts of Early China (History of Art 383) Not offered 1986-87]</td>
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<tr>
<td>[Chinese Painting (History of Art 385) Not offered 1986-87]</td>
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<tr>
<td>The Arts of Southeast Asia (History of Art 396)</td>
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<tr>
<td>[The Arts in Modern China (History of Art 481) Not offered 1986-87]</td>
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<tr>
<td>[Chinese Art of the T'ang Dynasty (History of Art 483) Not offered 1986-87]</td>
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<tr>
<td>[Studies in Chinese Painting (History of Art 486) Not offered 1986-87]</td>
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<tr>
<td>[Contemporary Chinese Society (Sociology 259) Not offered 1986-87]</td>
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<tr>
<td>Other courses dealing extensively with China are</td>
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<tr>
<td>Architecture 667-668; Government 347, 348, 350, 387, 446, and 645; History 190 and 191; History of Art 290, 381, 482, 580, and 596; Management NBA 586; and Sociology 342.</td>
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<tr>
<td>China—Language Courses</td>
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<tr>
<td>Basic Course (Chinese 101-102)</td>
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<tr>
<td>Cantonese Basic Course (Chinese 111-112)</td>
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<tr>
<td>FALCON (full-time course, Chinese 161-162)</td>
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South Asia—Area Courses

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<tr>
<th>Course</th>
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<tbody>
<tr>
<td>Food, Population, and Employment (Agricultural Economics 660)</td>
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<tr>
<td>[Cultures and Societies of India, Nepal, and Sri Lanka (Anthropology 342) Not offered 1986-87]</td>
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<tr>
<td>[Anthropological Approaches to the Study of Buddhism in Asia (Anthropology 619) Not offered 1986-87]</td>
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<tr>
<td>Himalayan Issues, Problems, and Prospects (Anthropology 623)</td>
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<tr>
<td>South Asia: Readings in Specific Problems (Anthropology 641)</td>
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<tr>
<td>Introduction to South Asian Civilizations (Asian Studies 215)</td>
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<tr>
<td>Introduction to Asian Religions (Asian Studies 250)</td>
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<tr>
<td>The Religious Traditions of India (Asian Studies 351)</td>
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<tr>
<td>South Asia Seminar: Agrarian Change in South Asia—Politics, Society, and Culture (Asian Studies 621 and Government 651)</td>
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<tr>
<td>South Asia Seminar (Asian Studies 622)</td>
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<tr>
<td>Communication in the Developing Nations (Communication Arts 624)</td>
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<tr>
<td>Postcolonial Literatures: Fictions of India (English 353)</td>
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<tr>
<td>India: Social and Economic Change in a Democratic Polity (Government 351) Not offered 1986–87]</td>
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<tr>
<td>[Buddhist Art in Asia (History of Art 381) Not offered 1986–87]</td>
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<tr>
<td>[Studies in Indian and Southeast Asian Art (History of Art 386) Not offered 1986–87]</td>
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<tr>
<td>India as a Linguistic Area (Linguistics 341)</td>
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<tr>
<td>Dravidian Structures (Linguistics 440)</td>
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<tr>
<td>Indo-Aryan Structures (Linguistics 442)</td>
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<tr>
<td>[Elementary Pali (Linguistics 640) Not offered 1986–87]</td>
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<tr>
<td>[Elementary Sanskrit (Linguistics 641–642) Not offered 1986–87]</td>
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<tr>
<td>Directed Research (Linguistics 701–702)</td>
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<tr>
<td>Rural Sociology and Agrarian Problems (Rural Sociology 205)</td>
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<tr>
<td>Gender Relations and Social Transformation (Rural Sociology 425)</td>
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<tr>
<td>Politics of Policy Planning and Evaluation (Rural Sociology 675)</td>
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<tr>
<td>[Applications of Sociology to Development Programs (Rural Sociology 751) Not offered 1986–87]</td>
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<tr>
<td>Sociotechnical Aspects of Irrigation (Rural Sociology 754)</td>
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South Asia—Language Courses

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<th>Course</th>
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<tbody>
<tr>
<td>Elementary Bengali (Bengali 121–122)</td>
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<td>Intermediate Bengali (Bengali 211–212)</td>
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<tr>
<td>Basic Course (Hindi 101–102)</td>
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<td>Hindi Reading (Hindi 201–202)</td>
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<tr>
<td>Composition and Conversation (Hindi 203–204)</td>
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<td>Readings in Hindi Literature (Hindi 301–302)</td>
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<td>Advanced Composition and Conversation (Hindi 303–304)</td>
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<tr>
<td>Basic Course (Nepali 101–102)</td>
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<tr>
<td>Intermediate Nepali Conversation (Nepali 201–202)</td>
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<td>Intermediate Nepali Composition (Nepali 203–204)</td>
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<td>Basic Course in Sinhala (Sinhala 101–102)</td>
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<td>Sinhala Reading (Sinhala 201–202)</td>
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<td>Composition and Conversation (Sinhala 203–204)</td>
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<td>Basic Course (Tamil 101–102)</td>
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<td>Basic Course (Telugu 101–102)</td>
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<td>Telugu Reading (Telugu 201–202)</td>
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Southeast Asia—Area Courses

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<th>Course</th>
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<tbody>
<tr>
<td>Microeconomic Issues in Agricultural Development (Agricultural Economics 664)</td>
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<tr>
<td>Sociotechnical Aspects of Irrigation (Agricultural Economics 754)</td>
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<tr>
<td>Agriculture Engineering 754, and Rural Sociology 754)</td>
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<tr>
<td>Meaning across Cultures (Anthropology 220) Not offered 1986–87]</td>
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<tr>
<td>[Ethnographic Description (Anthropology 306) Not offered 1986–87]</td>
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<td>Comparative Religious Systems (Anthropology 322)</td>
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<tr>
<td>[Histories of Ideas of Exotica (Anthropology 325) Not offered 1986–87]</td>
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<tr>
<td>[Ethnology of Island Southeast Asia (Anthropology 334) Not offered 1986–87]</td>
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<tr>
<td>Peoples and Cultures of Mainland Southeast Asia (Anthropology 335)</td>
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<tr>
<td>Balinese Culture: Description and Comparison (Anthropology 410)</td>
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<tr>
<td>[Myth and Mythology (Anthropology 610) Not offered 1986–87]</td>
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<tr>
<td>[Hierarchies, Ritual, and History (Anthropology 611) Not offered 1986–87]</td>
</tr>
<tr>
<td>[Anthropological Approaches to the Study of Buddhism in Asia (Anthropology 619) Not offered 1986–87]</td>
</tr>
<tr>
<td>[Political Anthropology: Indonesia (Anthropology 628 and Government 647) Not offered 1986–87]</td>
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Southeast Asia: Readings in Special Problems (Anthropology 634–635)
Astronomy


Professors and graduate students in astronomy at Cornell are very active in the national space exploration program as well as in studies of infrared astronomy and theoretical astrophysics. Cornell operates two local optical observatories and the world’s largest radio telescope at Arecibo, Puerto Rico.

The department offers a number of courses that are of general interest, have few or no prerequisites, and are not intended for the training of professional astronomers. These courses are numbered from 101 to 332. The last of these, Astronomy 332, requires calculus and a year of college physics, and Astronomy 111–112 require at least coregistration in beginning calculus. The other courses have no college prerequisites at all.

Courses numbered above 400 are intended for students who have had two to three years of college physics and at least two years of college mathematics.
Astronomy 440, Independent Study. permits students to engage in individual research projects under the guidance of a faculty member. There is no undergraduate major in astronomy at Cornell because the department believes that a major in physics and mathematics is the best preparation for the study of astronomy at the graduate level. Students who are interested in becoming astronomers should major in physics as undergraduates. It is wise to get an early start in mathematics and physics, preferably by registering for Mathematics 191—192, 193—194, or 111—112 in the freshman year and by taking Physics 112 as soon as the prerequisites have been completed.

Concentration

Students interested in astronomy are encouraged to supplement their major with a concentration in astronomy, which is somewhat less intensive than a major. All students are invited to visit the Space Sciences Building, see the exhibits on display there, and consult a faculty member about career plans or choice of courses.

Distribution Requirement

The distribution requirement in physical sciences is met by either of the following two sequences: Astronomy 101 and 102 or Astronomy 111 and 112.

Courses

101 The Nature of the Universe Fall. 4 credits. Lecs, M W F 11:15; labs, every other week. M T or W 2:30—5 or M T or W R 7:30—10 p.m.; disc, one hour every week: M or W 1:25, 2:30, 3:35, or 7:30 p.m. or T or R 2:30, 3:35, or 7:30 p.m. Y. Terzian, labs, M. P. Haynes.

The physical nature of existence. An examination of the universe and our place in it and the possible existence of life and intelligence elsewhere in the cosmos. The nature of stars, galaxies, and quasi-stellar sources. The birth, evolution, and death of stars and the formation of the chemical elements, including discussions of supernovae, pulsars, neutron stars, and black holes. The physical state, composition, and influence of the universe. Is the universe round or flat? How are the structures of Earth and the other planets? Will man catastrophically alter the earth? Does life exist elsewhere in the universe? How can we find it? Each student has an opportunity to make observations with small telescopes.

106 Essential Ideas in Relativity and Cosmology Summer. 3 credits. Prerequisites: high school algebra and trigonometry.

M—F 9:30—10:45. Staff.

Einstein's theories of special and general relativity, which brought about a fundamental change in our conceptual understanding of space and time, will be studied. Correspondence to, and conflicts with, common sense will be pointed out. Applications to various areas will be studied: i) special relativity—space travel, equivalence of mass and energy; nuclear fission and fusion, and thermonuclear processes in the sun; in general relativity—motion of light and particles in curved space-time; cosmological models, and the question of whether the universe is open or closed.

111 Astronomy: Stars, Galaxies, and Cosmology Fall. 4 credits. Intended for engineering and physical sciences freshmen. Prerequisite: introductory calculus or coregistration in Mathematics 111 or 119.

Lecs, M W F 10:10; rec, one hour each week to be arranged; plus some evening observing periods. S. Beckwith.


112 The Solar System: Planets, Satellites, and Rings Spring. 4 credits. Intended for engineering and physical sciences freshmen. Prerequisite: introductory calculus or coregistration in Mathematics 111 or 119.

Lecs, M W F 10:10; rec, one hour each week to be arranged; some evening observing labs to be arranged. P. D. Nicholson.

The origin of the solar system; celestial mechanics; tidal evolution; the physics and chemistry of planetary surfaces, atmospheres, and satellites; interiors, planetary rings; asteroids, comets, and meteors; the search for other planetary systems.

201 Our Home in the Universe Fall. 3 credits.


A general discussion of man's relation to the physical universe; the nature of space and time as understood in modern physics; the universe of galaxies and stars; and the particular system of planets and satellites encircling one such average star, our sun. The origin and evolution of the solar system as revealed by modern planetary exploration. The great uncertainties that remain.

215 Information and Knowledge in Science and Engineering (also Arts and Sciences 200) Fall. 4 credits.


Topics to be covered include the exact and probabilistic laws of nature; mean, median, content, and entropy; the Heisenberg uncertainty principle as a fundamental limitation on what we can know about the behavior of physical systems; coding of messages, cryptography, unbreakable codes, error-correcting codes; self-replicating machines; transmission of genetic information in biology; mutations and biological evolution; transmission, storage, and processing of information in machines and animals; robots and artificial intelligence; transmission of information across the universe—astronomical data and communication with intelligent civilizations. At the level of Scientific American.

[315 The Course of Science Fall. 4 credits. Not offered 1986—87]

321 Life in the Universe Spring. 4 credits. Not offered 1986—87]

332 Elements of Astrophysics Spring. 4 credits. Prerequisites: calculus and Physics 213. Physics 214 strongly recommended.

Lecs, M W F 11:15, J. M. Wasserman.

An introduction to astronomy, with emphasis on the application of physics to the study of the universe. Physical laws of radiation, distance, size, mass, and age of galaxies, and the physics of compact stars: evolution and nucleosynthesis. Supernovae, pulsars, and black holes. Galaxies and quasars. Introduction to cosmology. Intended for students interested in astronomy, physics, and engineering.

431 Introduction to Astrophysics and Space Sciences I Fall. 4 credits.


A systematic development of modern astrophysical concepts for physical science majors. Atomic and electromagnetic processes in space. Introduction to star formation, stellar structure, stellar atmospheres, and the interstellar medium. At the level of Astrophysical Concepts, by Harwit.

432 Introduction to Astrophysics and Space Sciences II Spring. 4 credits. Prerequisite: Astronomy 431 or permission of instructor.


Formation of the chemical elements. Origin of the solar system; stellar evolution; white dwarfs, neutron stars and black holes; stellar systems, clusters, galaxies, and quasars. Cosmology. At the level of Astrophysical Concepts, by Harwit.

[433 The Sun Spring. 4 credits. Not offered 1986—87]

[434 The Evolution of Planets Fall. 4 credits. Not offered 1986—87]

440 Independent Study in Astronomy Fall or spring. 2—4 credits. Prerequisite: permission of instructor. M W 4:30—6:00. S. Beckwith.

Critical thinking in scientific and nonscientific contexts with examples from the study of astronomy and other fields. Topics will include elements of classical logic and rhetoric, including standards of evidence. Case studies will include examples of competing hypotheses in the history of science, as well as examples from borderline science and medicine, religion, and politics. Stress will be laid on creative generation of alternative hypotheses and their winnowing by critical scrutiny. Discussion will be both qualitative and quantitative. Students from a wide diversity of fields will be admitted, but they must be well qualified. They will be expected to assimilate an extensive reading list, the seminar itself will be devoted to the implications of the readings and the interaction of the participants.

509 General Relativity (also Physics 553) Fall. 4 credits. Prerequisite: Knowledge of special relativity at the level of, for example, Classical Mechanics, by Goldstein.


A systematic introduction to Einstein's theory, with emphasis on modern coordinate-free methods of computation. Topics include review of special relativity, general relativity, geometry, foundations of general relativity, laws of physics in the presence of a gravitational field, and experimental tests of gravitational theories. At the level of Gravitation, by Misner, Thorne, and Wheeler.

510 Applications of General Relativity (also Physics 554) Spring. 4 credits. Prerequisite: Astronomy 509.

A continuation of Astronomy 509 with emphasis on applications to astrophysics and cosmology. Topics include relativistic stars, gravitational collapse and black holes, gravitational waves, and cosmology.


**[555 Theory of the Interstellar Medium (also Physics 665)]** Fall. 4 credits. M W F 1:25-2:40. E. E. Saipeter. Summary of observational data: theories of ionization and thermal equilibrium of the gas; grain formation and destruction; cloud structure and star formation; interstellar effects of cosmic rays and of supernovae. Galactic dynamics.


**[570 Physics of the Planets]** Fall. 4 credits. Not offered 1986–87.


**[579 Celestial Mechanics (also Theoretical and Applied Mechanics 672)]** Spring. 3 credits. Two 1 1/2 hour lec's a week, hours to be arranged. J. Burns. Description of orbits: 2-body, 3-body, and n-body problems. Hill curves, libration points and their stability, capture problems. Osculating elements, perturbation equations: effects of gravitational potentials, atmospheric drag, and radiation forces on satellite orbits. Secular perturbations, resonance problems, mechanics of planetary rings.


**[620 Seminar: Advanced Radio Astronomy]** Spring. 2 credits. Hours to be arranged. Y. Terzian, R. Giovanelli. Advanced topics in radio astrophysics, including radio emission from the interstellar medium, radio galaxies, and quasars.


**[640 Advanced Study and Research](Fall or spring. Credit to be arranged. Hours to be arranged. Staff. Guided reading and seminars on topics not currently covered in regular courses.**


**[671 Seminar: Geology of Outer Planet Satellites](Fall. 3 credits. Hours to be arranged. J. F. Veverka. A review of our understanding of the internal and external processes that have shaped the surfaces of the satellites of Jupiter, Saturn, and Uranus. The emphasis will be on determining the time sequence of important geologic events from Voyager imaging data.**

**[671 Seminar: Research with the Space Shuttle and Space Station]** Spring. 2 credits. Hours to be arranged. A. Newman. The capabilities of the U.S. space shuttle and space station in performing basic scientific research. Emphasis will be placed on solar system exploration and galactic and extragalactic astronomy from space.

**[672 Seminar: Origin of the Solar System](Fall. 4 credits. Hours to be arranged. D. J. Stevenson. A critical assessment of the physical processes responsible for the formation of the sun and planets, including astrophysical constraints, gravitational instabilities and accretion discs, formation and early evolution of the giant planets and their satellite systems, terrestrial planetary accretion, primary differentiation, outgassing, and thermal evolution of solid bodies.**

**[673 Seminar: Remote Sensing](Spring. 2 credits. Not offered 1986–87.**


**[690 Seminar: Computational Astrophysics (also Physics 681)]** Fall. 3 credits. Not offered 1986–87.

**[699 Seminar: Topics in Theoretical Astrophysics](Fall. 3 credits. Not offered 1986–87.**

**Biological Sciences**

G. W. G. Sharp, director (200 Stimson Hall, 255-5042); H. T. Sinton, associate director and director of undergraduate studies (118 Stimson Hall, 255-5233); K. L. Guests, Biology Center coordinator (Biology Center, G200 Stimson Hall, 255-3535); R. F. Marska, executive staff assistant (118 Stimson Hall, 255-6859). Biology is a popular subject at many universities for a variety of reasons: it is a science that is in an exciting phase of development; it prepares students for careers in challenging and appealing fields such as human and veterinary medicine and environmental sciences; and it deals with the inherently interesting questions that arise when we try to understand ourselves and the living world around us. Many of the decisions we face today deal with the opportunities and problems that biology has put before us.

The program of study in biology at Cornell is offered by the Division of Biological Sciences to students enrolled in either the College of Agriculture and Life Sciences or the College of Arts and Sciences. Student services in the division's office for academic affairs and the Behrman Biology Center are available to students from either college.

The biology major is designed to enable students to acquire necessary scientific foundations, to concentrate in a specific area of biology, and to obtain breadth by studying different aspects of modern biology. Areas of concentration include animal physiology and anatomy, biochemistry, botany, cell biology, ecology, systematics, and evolution; genetics and developmental biology; and neurobiology and behavior. Special concentration programs are available for qualified students with particular interest in areas such as biophysics, microbiology, or nutrition. As an alternative to selecting one of the concentration areas, students may choose to complete the Program in General Biology. Students interested in the marine sciences may consult the Cornell Marine Programs Office (G14 Stimson Hall, 255-3770) for academic advice and career counseling. For more details about the biology curriculum see the section in this catalog on the Division of Biological Sciences.

**Chemistry**


The chemistry department offers a full range of courses in physical, organic, inorganic, analytical, theoretical, biorganic, and biophysical chemistry. In addition to their teaching interests, chemistry faculty members have active research programs. The courses provide the basis for significant work in the link between teaching and research is a vital one in a continuously evolving scientific subject; it ensures that students will be provided with the most advanced information and perspectives.

**The Major**

The chemistry major at Cornell is not an easy option; it requires conceptual skills in mathematics and logical thinking, practical and laboratory skills, and creativity in the design of experiments. In recent years chemistry majors have gone on to graduate study in chemistry, medicine, law, and business management, as well as directly into positions with chemical, pharmaceutical, and other industrial companies. A major in chemistry can provide the basis for significant work in related areas such as molecular biology, chemical physics, geochemistry, chemical engineering, and solid state physics. A major in chemistry permits considerable flexibility in the detailed planning of a course program. The required courses can be completed in three years, leaving the senior year open for advanced and independent work under the supervision of a professor.

The courses are arranged as a progression, with some courses (including mathematics and physics) prerequisite to those that are more advanced. During the first year, the student should normally register for general chemistry (preferably but not necessarily Chemistry 215), mathematics, a Freshman Seminar course, a foreign language if necessary, or, in some instances, physics. Although Chemistry 215–216 is preferred, students may begin their programs with Chemistry 207–208. Chemistry 215–216 is limited to those students with good preparation and a strong interest in chemistry. Students who do not know if their preparation is adequate should consult the instructor. In the second year the student should complete calculus and take physics and organic chemistry. Chemistry 359–360 is preferred to Chemistry 357–358. The second-year laboratory courses include 300, Quantitative Chemistry, if needed, and 301.
Experimental Chemistry I; 389–390, Physical Chemistry I and II; and 302–303. Experimental Chemistry II and III, which should be completed in the third year. Advanced work in chemistry and related subjects can be pursued in the fourth year and, to some extent, in the earlier years as well. The opportunity for independent research is also available. All students with operating laboratory sessions are encouraged to consult the chairperson of the Department of Chemistry or the chairperson’s representative. Entering students who are exceptionally well prepared may receive advanced placement credit for Chemistry 207–208 and proceed to a more advanced program.

Prerequisites for admission to a major in chemistry are:
1. Chemistry 215–216 or 207–208 plus 300, 302, 303, 359–360 (or, if necessary, 357–358 may be substituted), and 389–390
2. Mathematics 112 plus 213; or 122 plus 221, 222; or 192 plus 233, 294
3. Physics 208

Potential majors electing to take mathematics 213 are strongly urged to do so in their sophomore year to avoid scheduling conflicts with Chemistry 389 in their junior year.

This sequence is a core program in chemistry. It is anticipated that students will, through elective courses, extend it substantially in whatever direction suits their own needs and interests. It is particularly important that those planning work in chemistry recognize that these requirements are minimal, and such students are strongly urged to supplement their programs, where possible, with Chemistry 405, 410, 605, 606, 668, and 681 and German or Russian. Even students not planning graduate work in chemistry should consider advanced work in physics and mathematics, courses in the biological sciences, and advanced work in chemistry as possible extensions of the basic program.

Honors. The honors program in chemistry offers superior students an opportunity to study independently in seminars and to gain additional experience by engaging in research during the senior year. It is particularly recommended to those who plan to graduate work in chemistry. Prospective candidates should consult the introductory organic chemistry and physical chemistry sequences by the end of the junior year. However, failure to have completed those courses in the junior year does not in itself disqualify a student from the honors program. Completion of the program at a high level of performance leads to the degree of Bachelor of Arts with honors in chemistry. Students will be admitted to the program by invitation of the department. Selection will be based on a superior cumulative average, including chemistry grades, and good performance in a prior research program.

Prospective candidates should discuss their plans with advisers by March 1 of their junior year. Participants are notified by early January of their senior year. To be awarded honors, candidates must show outstanding performance in at least 8 credits of undergraduate research such as is offered in Chemistry 421, 433, 461, or 477. In addition, superior performance, including the writing of a thesis, in the honors seminar (Chemistry 498) is expected.

Laboratory Course Regulations

Students registered for laboratory courses who do not appear at the first meeting of the laboratory will forfeit their registration in that course.

Students and members of the teaching staff are required to wear safety goggles in all chemistry laboratories. Students are reminded to take their goggles to the laboratory session. Students who fail to cooperate with the safety program will be asked to leave the laboratories.

Students are required to pay for glassware and any other items broken or missing from their laboratory desks at the close of each semester. Students who fail to inventory their desks at the appointed time in the presence of their instructor are charged a $10 fee in addition to charges for any breakage.

Courses

Preliminary examinations for all courses may be given in the evening.

103–104 Introduction to Chemistry 103, fall or summer; 104, spring or summer. 3 credits each term. Enrollment limited. Prerequisite for Chemistry 104: Chemistry 103. Recommended for students who have not had high school chemistry and for those needing a less mathematical course than Chemistry 207–208. Not recommended for those planning to do further work in chemistry subsequent to Chemistry 104. Lecs, M W T R 11:10–12:20; lab, T R 8–9; or T R 9:05–10:10; or M W F 1:25–4:25; Prelims: 7:30–9 p.m., Oct. 7; Nov. 11; March 5; April 16. Fall: A. C. Albrecht, G. G. Hammes; spring: D. Usher. An introduction to chemistry, with emphasis on the important principles and facts of inorganic and organic chemistry.

207–208 General Chemistry 207, fall or summer; 208, spring or summer. 4 credits each term. Enrollment limited. Recommended for those students who will take further courses in chemistry. Prerequisite for Chemistry 207: high school chemistry. Prerequisite for Chemistry 208: Chemistry 207 or 103–104. Lecs, fall: T R 9:05, 10:10, or 12:20; spring, T R 9:05, 10:10–11:10; Lab. fall: T R 8–9; lab, T R 9:05–10:10; M W T R or F 1:25–4:25; spring, M W T R or F 12:20–4:25 or S 8–12. Prelims: 7:30–9 p.m., Sept. 30, Nov. 4, March 3, April 23, Fall: J. C. Clardy, P. T. Wolczanski; spring: K. H. Theopold. The important chemical principles and facts are covered, with considerable attention given to the quantitative aspects and to the techniques important for further work in chemistry. Secondary-term laboratory includes a systematic study of qualitative analysis.

Note: Entering students exceptionally well prepared in chemistry may receive advanced placement credit for Chemistry 207–208 by demonstrating competence in the advanced placement examination of the College. Entrance Examination Board or in the departmental examination given at Cornell before classes start in the fall.

122 Arts and Sciences

301 Experimental Chemistry I Spring. 4 credits. Prerequisite: Chemistry 216 or 300, and 253 or 367 or 389. Concurrent registration in Chemistry 253 is not recommended.
An introduction to synthesis and the separation and handling of materials, including applications of many types of chromatography, simple and fractional distillation, crystallization, extraction, and others.

302 Experimental Chemistry II Fall. 4 credits. Enrollment limited; preference given to chemistry majors. Prerequisite: Chemistry 301.
Synthesis and quantitative analysis of both inorganic and organic compounds; instrumental methods, including optical spectroscopy, atomic absorption, NMR, mass spectroscopy, gas chromatography, GCMS, and electrochemical methods, are surveyed. Trace element analysis.

303 Experimental Chemistry III Spring. 4 credits. Each lab limited to 24 students. Prerequisites: Chemistry 302, 389, 390; coregistration in the latter is permissible.
An introduction to the techniques of vacuum line construction and operation; the principles and assembly of electronic measuring devices, optics, and kinetics.

357–358 Introductory Organic Chemistry 357, fall; 358, spring. 3 credits each term. Prerequisite for Chemistry 357: Chemistry 208 or 216 or advanced placement; recommended: concurrent registration in Chemistry 251. Prerequisite for Chemistry 358: Chemistry 357; recommended: concurrent registration in Chemistry 351.
Lecs, M W F 9:05; optional rec may be offered. J. Meinwald.
A systematic study of the more important classes of carbon compounds—reactions of their functional groups, methods of synthesis, reactions, and uses.
Note: Because of duplication of material, students are not permitted to earn both 4 credits for Chemistry 253 and 3 credits for Chemistry 357. In special situations (consult instructor for details), students should take Chemistry 255 for 4 credits after having earned 3 credits for Chemistry 357. Students will not be permitted to take Chemistry 358 after completing Chemistry 253.

359–360 Organic Chemistry I and II 359, fall; 360, spring. 4 credits each term. Recommended for students who intend to specialize in chemistry or closely related fields. Enrollment limited. Prerequisites: Chemistry 216 with a grade of B or better, Chemistry 208 with a grade of A or better, or permission of instructor. Prerequisite for Chemistry 360: Chemistry 359. Recommended: coregistration in Chemistry 300–301–302.
Lecs, M W F 9:05; makeup lecs, W 7:30 p.m. Fall: B. Ganem; spring: J. C. Grady.
A rigorous and systematic study of organic and organometallic compounds, their structures, the mechanisms of their reactions, and the ways they are synthesized in nature and in the laboratory.

389–390 Physical Chemistry I and II 389, fall; 390, spring. 4 credits each term. Prerequisites: Mathematics 213 or, ideally, 221–222; Physics 208; Chemistry 208 or 216 or permission of instructor. Prerequisite: Chemistry 389.
Lecs, M W F 10:10; rec and makeup lecs, W 7:30 p.m. Prelims: 7:30–9 p.m., Sept. 23, Oct. 21, Nov. 18, Feb. 17, March 12, April 7, May 7. Fall: H. A. Scheraga, L. Glasser; spring: R. E. Porter.
The principles of physical chemistry are studied from the standpoint of the laws of thermodynamics, kinetic theory, and quantum chemistry.

405 Techniques of Modern Synthetic Chemistry Spring. 6 credits. Enrollment limited. Prerequisite: Chemistry 302 or permission of instructor. Selection of students will be based on grades in Chemistry 301 and 302. With permission of the instructor, graduate students may perform a minimum of three two-week experiments on a prearranged schedule.
Lab time required: 16 hours each week, including at least two 4-hour sessions in 2 sections (M W 1:25 or T R 1:25). First meeting will be at 4:30 on first class day of semester. Last first week only, at times to be arranged. J. M. Burtich.
The syntheses of complex organic and inorganic molecules are carried out with emphasis on the following techniques: vacuum line, high pressure, high-temperature solid state, inert atmosphere, nonaqueous solvents, radioactive labeling, photochemical and electrochemical methods, solid phase peptide synthesis, and macro and micro techniques.
Elementary glassblowing.

410 Inorganic Chemistry Spring. 4 credits. Prerequisites: Chemistry 358 or 360, and 389.
A systematic study of the synthesis, structure, and reactivity of inorganic and organometallic compounds.

421 Introduction to Inorganic Research Fall or spring. 2–4 credits. Prerequisites: Chemistry 303 and 390, or Chemistry 287–288, and Chemistry 289–300 with an average of B– or better, or permission of instructor.
Selected faculty.
Research in inorganic chemistry involving both laboratory and library work, planned in consultation with a faculty member.

433 Introduction to Analytical Research Fall or spring. 2–4 credits. Prerequisites: Chemistry 303 and 390 with an average of B– or better or permission of instructor.
Selected faculty.
Research in analytical chemistry involving both laboratory and library work, planned in consultation with a faculty member.

461 Introduction to Organic Research Fall or spring. 2–4 credits. Prerequisites: Chemistry 303 or 360 with a grade of B– or better or permission of instructor.
Selected faculty.
Research in organic chemistry involving both laboratory and library work, planned in consultation with a faculty member.

477 Introduction to Research in Physical Chemistry Fall or spring. 2–4 credits. Prerequisites: Chemistry 289 with an average of B– or better or permission of instructor.
Selected faculty.
Research in physical chemistry involving both laboratory and library work, planned in consultation with a faculty member.

498 Honors Seminar Spring. No credit. Admission by departmental invitation. Additional prerequisite or corequisite: outstanding performance in either (1) two coherent 4-credit units of research in a course such as Chemistry 421, 433, 461, or 477; or (2) one 4-credit unit in a course such as Chemistry 421, 433, 461, or 477 and summer research equivalent to at least 4 credits in the same subject.
W 2:30–4: W. D. Cooke.
Informal presentations and discussions of selected topics in which all students participate. Individual research is on advanced problems in chemistry under the guidance of a faculty member, culminating in a written report.

600–601 General Chemistry Colloquium 600, fall; 601, spring. No credit. Required of all graduate students except those majoring in organic or biochemical chemistry. Juniors and seniors are encouraged to attend.
R 4.

A series of talks representative of all fields of current research interest in chemistry other than organic chemistry as given by distinguished visitors and faculty members.

605 Advanced Inorganic Chemistry I: Symmetry and Structure Fall. 4 credits. Prerequisite: Chemistry 389–390 or equivalent or permission of instructor.
Lecs, M W F 11:15, R. C. Fay.
This is the first of a three-term sequence. Group theory at the level of Cotton’s Chemical Applications of Group Theory, Schonland’s Molecular Symmetry, and Hall’s Group Theory and Symmetry in Chemistry. Applications include molecular orbital theory, hybridization, molecular vibrations, and ligand field theory. Readings are suggestions and units covering elements at the level of Cotton and Wilkinson’s Advanced Inorganic Chemistry.

606 Advanced Inorganic Chemistry II: Synthesis and Reactivity of Inorganic and Organotransition Metal Compounds Fall. 4 credits. Lecs, M W F 10:10, K. H. Theopold.
Synthesis, structure, and reactivity of organometallic complexes. Emphasis on mechanistic considerations of fundamental processes. An overview of homogeneous catalysis and applications of organometallics in organic synthesis is included. Readings at the level of Collman and Hegedus’s Principles and Applications of Organotransition Metal Chemistry.

607 Advanced Inorganic Chemistry III: Structure and Properties Spring. 4 credits. Prerequisite: Chemistry 605 or permission of instructor.
Lecs, M W F 9:05, F. J. DiSalvo.
The third of a three-term sequence. Introduction to ligand field theory and solid-state structure and properties, at the level of Figgis’s Introduction to Ligand Fields, Kreb’s Fundamentals of Inorganic Crystal Chemistry, and Sach’s Solid State Theory. Readings in transition metal chemistry at the level of Cotton and Wilkinson’s Advanced Inorganic Chemistry.

622 Chemical Communication (also Biological Sciences 623) Fall. 3 credits. Limited to 30 students. Prerequisites: Chemistry 358, Biological Sciences 102, and Biochemistry 231. Intended primarily for research-oriented students. Offered alternate years. Not offered 1986–87.
Lecs, M W F 1:25, J. Meinwald.
The production, transmission, and reception of chemical signals in communicative interactions of animals, plants, and microorganisms. Communication involving insects is emphasized. Specific topics are treated, with varying emphasis on chemical, biochemical, neurobiological, ecological, and evolutionary principles.

625 Advanced Analytical Chemistry I Fall. 4 credits. Prerequisite: Chemistry 288 or 390 or equivalent.
Lecs, M W F 8; exams, T 7:30 p.m. W. D. Cooke, F. W. McLafferty.
The application of molecular spectroscopy to chemical problems. Topics in infrared, NMR, Raman, and mass spectroscopy are discussed.

627 Advanced Analytical Chemistry II Spring. 3 credits. Primarily for graduate students. Prerequisite: Chemistry 288 or 390 or equivalent. Not offered 1986–87.
Lecs, T R 10:10; problem sessions and exams, T 7:30 p.m. F. W. McLafferty.
Modern analytical methods, including electron, Mossbauer, and Fourier spectroscopy; mass spectrometry; methods applicable to macromolecules; information theory.

628 Advanced Analytical Chemistry III Spring. 3 credits. Primarily for graduate students. Prerequisite: Chemistry 288 or 390 or equivalent.
Lecs, T R 10:10, G. H. Morrison.
Modern classical and surface methods of analysis,
Principles of equilibrium thermodynamics.
Thermodynamic functions; First and Second Laws; gases and condensed phases; solutions; phase equilibrium; chemical equilibrium; surface thermodynamics; electrolytes; statistical thermodynamics and the Third Law.

681 Physical Chemistry III Fall. 4 credits. Prerequisites: Chemistry 288 or 390; Mathematics 212 and Physics 232, or equivalents.
Lecs. M W F 10:10 and occasionally W 7:30 p.m. R. F. Porter.
An introduction to the principles of quantum theory and statistical mechanics, atomic and molecular spectra, and electron and nuclear structure theory. At the level of Quantum Chemistry, by Levine.

686 Physical Chemistry of Proteins Spring. 4 credits. Primarily for graduate students.
Prerequisites: Chemistry 288 or 390 or equivalents.
Offered alternate years.
Lecs. M W F 8, and occasionally W 7:30 p.m. H. A. Scheraga.
Chemical constitution, molecular weight; and structural basis of proteins; thermodynamic, hydrodynamic, optical, spectroscopic, and electrical properties; protein and enzyme reactions; statistical mechanics of helix-coil transition in biopolymers; conformation of biopolymers; protein folding.

700 Baker Lectures Spring, on dates to be announced. No credit.
Distinguished scientists who have made significant contributions to chemistry present lectures for periods varying from a few weeks to a full term. This year's lecturer: Allen J. Bard, University of Texas, Austin.

710—712 Introductory Graduate Seminar in Analytical, Inorganic, and Physical Chemistry Fall, 4 credits. Primarily for graduate students.
Prerequisites: Chemistry 288 or 390 or equivalents.
Lecs. M W F 8, 9:05 and occasionally W 7:30 p.m. A. C. Albrecht.
Modern techniques of synthesis, applications of organic reaction mechanisms to the problems encountered in natural multistep synthesis, with particular emphasis on modern developments in synthetic design.

765 Special Topics in Biophysical and Bioorganic Chemistry Spring. 3 credits. Not offered 1986–87.
Lecs, T R 11:15.
Topics vary from year to year.

789 X-ray Crystallography Fall; offered only when sufficient registration warrants. 4 credits. Prerequisite: Chemistry 288 or 390 or permission of instructor.
A beginning course in the application of X-ray crystallography to structural chemistry. Topics include symmetry properties of crystals, diffraction of X-rays by crystals, interpretation of diffraction data, and refinement of structures. The chemical information available from a diffraction experiment is stressed, and theoretical aspects are illustrated by conducting an actual structure determination as a classroom exercise. At the level of Ladd and Palmer's Structure Determination by X-ray Crystallography.

792 Molecular Collision Theory Spring. 3 credits.
How to be arranged. G. S. Ezra.
The concepts and methods of scattering theory are described with particular emphasis on applications to problems of chemical interest at the level of Child's Molecular Collision Theory and Taylor's Scattering Theory.

793 Quantum Mechanics II Fall. 4 credits.
Prerequisites: Chemistry 681, coregistration in Mathematics 421, and Physics 431 or equivalents or permission of instructor.
Schrodinger's equation, wave packets, uncertainty principle, WKB theory, matrix mechanics, orbital and spin angular momentum, exclusion principle, perturbation theory, variational principle, Born-Oppenheimer approximation. At the level of Bohm's Quantum Theory.

794 Quantum Mechanics II Spring. 4 credits.
Prerequisites: Chemistry 793 or equivalent and coregistration in Physics 432 and Mathematics 422, or permission of instructor.
Lecs, M W F 9:05. A. C. Albrecht.
Time-dependent phenomena in quantum mechanics and interaction with radiation. Group theory and applications in molecular spectroscopy and electronic structure of atoms and molecules. At the level of Weissbuch's Atoms and Molecules.

796 Statistical Mechanics (also Physics 562) Spring. 4 credits. Primarily for graduate students.
Prerequisite: Chemistry 793 or equivalent.
Microstates, ensembles, partition functions, and phase-space averaging. Thermodynamic functions and equations of state. Chemical equilibria. Scattering probes, correlation functions, and fluctuations. Quantum statistical mechanics, Fermi-Dirac and Bose-Einstein distributions; Bose-Einstein condensation. Ideal crystals. Virial expansion; simulation methods; metallic and insulating liquids; phase transitions. Density matrix, response methods, and transport. Lattice gases and spin systems; Ising model and critical exponents; melting; freezing; and the wetting of interfaces. At the level of Statistical Mechanics, by Pathria, and Statistical Mechanics, by McQuarrie.

762 Organic and Organometallic Chemistry Seminar Fall, 65, 66, 665, spring. No credit. Required of all graduate students majoring in organic or bioorganic chemistry.
Juniors and seniors are encouraged to attend.
M 4.
A series of talks representative of all fields of current research interest in organic and organometallic chemistry, given by research associates, faculty members, and distinguished visitors.

650 Advanced Organic Chemistry Fall. 4 credits. Primarily for graduate students and upperclass undergraduates. Prerequisites: Chemistry 253 or 358 or 360, and 390 or equivalents or permission of instructor.
Lecs. M W F 12:20; make-up lectures and exams, 7:30 p.m. C. F. Wilcox.
A survey of reaction mechanisms and reactive intermediates in organic chemistry. Applications of qualitative molecular orbital theory are emphasized.

665 Synthetic Organic Chemistry Spring. 4 credits. Primarily for graduate students and upperclass undergraduates. Prerequisites: Chemistry 665 or permission of instructor.
Modern techniques of synthesis, applications of organic reaction mechanisms to the problems encountered in rational multistep synthesis, with particular emphasis on modern developments in synthetic design.

688 Chemical Aspects of Biological Processes Fall. 4 credits. Prerequisites: Chemistry 358 or 360, and 390 or 289 or equivalents. Not offered 1986–87.
Lecs, M W F 10:10. B. A. Baird.
Biochemical systems, bioenergetics, enzymes, metabolic pathways, chemical evolution. This course forms the chemical basis for the graduate program in molecular biology.

672 Enzyme Catalysis and Regulation Spring. 4 credits. Primarily for graduate students in chemistry and biochemistry. Prerequisites: Chemistry 358 or 360, and 390 or equivalents, and a course in general biochemistry. Not offered 1986–87.
Lecs, M W F 10:10. B. A. Baird.
Principles of equilibrium thermodynamics.
Thermodynamic functions; First and Second Laws; gases and condensed phases; solutions; phase equilibrium; chemical equilibrium; surface thermodynamics; electrolytes; statistical thermodynamics and the Third Law.

681 Physical Chemistry III Fall. 4 credits. Prerequisites: Chemistry 288 or 390; Mathematics 212 and Physics 232, or equivalents.
Lecs. M W F 10:10 and occasionally W 7:30 p.m. R. F. Porter.
An introduction to the principles of quantum theory and statistical mechanics, atomic and molecular spectra, and electron and nuclear structure theory. At the level of Quantum Chemistry, by Levine.

686 Physical Chemistry of Proteins Spring. 4 credits. Primarily for graduate students.
Prerequisites: Chemistry 288 or 390 or equivalents.
Offered alternate years.
Lecs. M W F 8, and occasionally W 7:30 p.m. H. A. Scheraga.
Chemical constitution, molecular weight; and structural basis of proteins; thermodynamic, hydrodynamic, optical, spectroscopic, and electrical properties; protein and enzyme reactions; statistical mechanics of helix-coil transition in biopolymers; conformation of biopolymers; protein folding.

700 Baker Lectures Spring, on dates to be announced. No credit.
Distinguished scientists who have made significant contributions to chemistry present lectures for periods varying from a few weeks to a full term. This year's lecturer: Allen J. Bard, University of Texas, Austin.

710—712 Introductory Graduate Seminar in Analytical, Inorganic, and Physical Chemistry Fall, 4 credits. Primarily for graduate students.
Prerequisites: Chemistry 288 or 390 or equivalents.
Lecs. M W F 8, 9:05 and occasionally W 7:30 p.m. A. C. Albrecht.
Modern techniques of synthesis, applications of organic reaction mechanisms to the problems encountered in natural multistep synthesis, with particular emphasis on modern developments in synthetic design.

765 Special Topics in Biophysical and Bioorganic Chemistry Spring. 3 credits. Not offered 1986–87.
Lecs, T R 11:15.
Topics vary from year to year.

789 X-ray Crystallography Fall; offered only when sufficient registration warrants. 4 credits. Prerequisite: Chemistry 288 or 390 or permission of instructor.
A beginning course in the application of X-ray crystallography to structural chemistry. Topics include symmetry properties of crystals, diffraction of X-rays by crystals, interpretation of diffraction data, and refinement of structures. The chemical information available from a diffraction experiment is stressed, and theoretical aspects are illustrated by conducting an actual structure determination as a classroom exercise. At the level of Ladd and Palmer's Structure Determination by X-ray Crystallography.

792 Molecular Collision Theory Spring. 3 credits.
How to be arranged. G. S. Ezra.
The concepts and methods of scattering theory are described with particular emphasis on applications to problems of chemical interest at the level of Child's Molecular Collision Theory and Taylor's Scattering Theory.

793 Quantum Mechanics II Fall. 4 credits.
Prerequisites: Chemistry 681, coregistration in Mathematics 421, and Physics 431 or equivalents or permission of instructor.
Schrodinger's equation, wave packets, uncertainty principle, WKB theory, matrix mechanics, orbital and spin angular momentum, exclusion principle, perturbation theory, variational principle, Born-Oppenheimer approximation. At the level of Bohm's Quantum Theory.

794 Quantum Mechanics II Spring. 4 credits.
Prerequisites: Chemistry 793 or equivalent and coregistration in Physics 432 and Mathematics 422, or permission of instructor.
Lecs, M W F 9:05. A. C. Albrecht.
Time-dependent phenomena in quantum mechanics and interaction with radiation. Group theory and applications in molecular spectroscopy and electronic structure of atoms and molecules. At the level of Weissbuch's Atoms and Molecules.

796 Statistical Mechanics (also Physics 562) Spring. 4 credits. Primarily for graduate students.
Prerequisite: Chemistry 793 or equivalent.
Microstates, ensembles, partition functions, and phase-space averaging. Thermodynamic functions and equations of state. Chemical equilibria. Scattering probes, correlation functions, and fluctuations. Quantum statistical mechanics, Fermi-Dirac and Bose-Einstein distributions; Bose-Einstein condensation. Ideal crystals. Virial expansion; simulation methods; metallic and insulating liquids; phase transitions. Density matrix, response methods, and transport. Lattice gases and spin systems; Ising model and critical exponents; melting; freezing; and the wetting of interfaces. At the level of Statistical Mechanics, by Pathria, and Statistical Mechanics, by McQuarrie.
Selected Topics in Physical Chemistry
Spring. 3 credits. Prerequisite: Chemistry 793 or equivalent; Chemistry 794 recommended but not essential. Lect. T R 8:30-10. M. E. Fisher. Topics vary. In spring 1987 the topic will be surfaces and interfaces.

Chinese
See Departments of Asian Studies and Modern Languages, Literatures, and Linguistics.

Classics
Sir Kenneth Dover, A. D. White Professor-at-Large; M. Dettelen, Townsend Lecturer
Cornell University has long recognized the importance of studying civilizations of ancient Greece and Rome. Especially in an age of increasing specialization, study of the Classics is vital. They are viewed as a means of acquiring a liberal education; at Cornell, we are deeply interested in the continuing humanistic values contained in the literature of the ancient world and in gaining a fuller understanding of these important cultures and their imprint upon subsequent ages.

The Department of Classics at Cornell is one of the oldest and largest in the country. With sixteen faculty members, together with professors of related interests in the departments of History, Philosophy, Comparative Literature, History of Art, Architecture, Modern Languages and Linguistics, and Near Eastern Studies and in the Medieval Studies program, the range of opportunities for study is very large, including not only the traditional study of language, literature, and ancient history, but also newer developments in the field, such as comparative study of Mediterranean civilizations and modern literary theory.

Although Classics, like other areas of humanistic study, does not aim at providing specific preprofessional training, over the years majors from the Classics Department have gone on to a wide variety of careers: in law, teaching, medicine, archaeology, diplomacy, management, educational administration, government, and many others.

The department offers courses in Bronze Age and Classical archaeology and is active in field archaeology in Classical lands. It recently sponsored an archaeological excavation at Alambra, in Cyprus, which served as a field training school for Cornell undergraduate and graduate students, and plans are under way for further excavation projects. On campus there are also collections of ancient artifacts, reproductions of ancient sculpture, and one of the few laboratories in the world that concentrate on the tree-ring dating of ancient monuments from Greece, Cyprus, and Turkey. The archaeology courses may be used to satisfy some of the requirements for the intercollegiate program in archaeology or for the major in Classical Civilization. They require no knowledge of either Greek or Latin. Similarly, the department offers a variety of courses in English on such subjects as Greek mythology, Greek and Roman mythology, early Christianity, and Roman law, as well as ancient epic, tragedy, history, and philosophy. For those whose interest in things Greek and Roman extends no further than a desire to understand the English language a little better, the department offers a course in the Greek and Latin elements that make up well over half of modern English vocabulary, and

programs in Latin and Greek at the elementary level; another course deals with Greek and Latin elements in bioscientific vocabulary. For the more ambitious there are courses involving the reading, in the original, of Greek and Latin classics from Homer to St. Augustine and Bede and, periodically, the Latin works of Dante, Petrarch, and Milton. The department makes every attempt to adapt its program to the needs of each student. If there is a Classical writer you would like to study, the department will do its best to help you do so whether you are a major in the department or not.

Majors
The Department of Classics offers majors in Classics, Greek, Latin, and Classical civilization.

Classics
Those who major in Classics must complete 24 credits in advanced courses in Greek or Latin (courses numbered 201 or above) and 15 credits in related subjects selected after a conference with the adviser.

Classical Civilization
Those who major in Classical civilization must complete (a) a qualification in Latin and Greek or proficiency in either; (b) 24 credits selected from the courses listed under Classical civilization. Classical civilization, Latin, and Greek are major requirements in the civilizations selected in conference with the adviser.

Greek
Those who major in Greek must complete 24 credits of advanced courses in Greek and 15 credits in related subjects (including Latin). One or more courses offered by the Department of Comparative Literature may be counted towards the required 24 credits of Greek if the student obtains the prior approval of the major adviser.

Latin
Requirements for the major in Latin parallel those of the major in Greek.

Honors. Candidates for the degree of Bachelor of Arts with honors in Classics, Greek, Latin, or Classical civilization must fulfill the requirements of the appropriate major study as given above and must also complete successfully the special honors courses 370, 471, and 472. Credit for honors courses may be included in the credits required for the major study. Students who wish to become candidates for honors, who have a cumulative average of B + or better, and who have demonstrated superior performance in Classical courses (Greek, Latin, and Classical civilization), submit an outline of their proposed honors work to the honors committee during the first month of their fifth semester. The chairman will appoint a committee of three faculty members for each candidate, and the committee will be responsible for evaluating the proposal of the candidate and subsequently supervising his or her work. At the completion of the honors thesis, which must demonstrate knowledge of the main bibliographical sources, give promise of scholarly talents, and show a creative mind, the committee will determine the level of honors to be awarded.

Study Abroad
Cornell participates in the Intercollégiate Center for Classical Studies in Rome, which offers courses in Latin, Greek, ancient history, art, archaeology, and Italian. Cornell is a member institution of the American School of Classical Studies at Athens, whose Summer Program is open to graduate students and qualified undergraduates. The American Academy in Rome, of which Cornell is also a member institution, offers regular and summer programs for qualified graduate students. For both undergraduate and graduate students the Department of Classics offers a few travel grants each year from the Townsend Memorial Fund.

Detailed information on these programs is available in the Department of Classics Office, 120 Goldwin Smith Hall.

Placement in Latin
Placement of first-year students in Latin courses is determined by an examination given by the Department of Classics. If necessary, in the second half of the fall term.

Classical Civilization

100 Word Power: Greek and Latin Elements in the English Language
Fall or summer. 3 credits. M W F 9:05. G. M. Messing. This course gives the student with no knowledge of Classical languages an understanding of how the Greek and Latin elements, which make up over half our English vocabulary, operate in both literary and scientific English usage. Attention is paid to how words acquire their meaning and to enlarging each student's working knowledge of vocabulary and grammar.

102 Word Power for the Biological Sciences
Spring or summer. 3 credits. M W F 11:15. M. Cook. This course teaches the Greek and Latin word elements that combine to form most of the specialized terms in the biological sciences. The student who learns the meanings of these elements and the rules of word formation will usually recognize the basic meaning of any unfamiliar word in this field. Attention will also be paid to misformations, common errors, and words still in use that reflect scientific theories since rejected.

120 Freshman Seminar in Latin Literature
Fall. 3 credits. Staff. By examining some of the great works of Roman literature, this class hopes to achieve an understanding of Classical culture and its influence upon the modern world. Emphasis on close reading of individual texts and on sharply focused writing assignments.

121 Freshman Seminar in Classical Archaeology
Fall or spring. 3 credits. Staff. Archaeological research illuminates both the great achievements and the daily lives of the ancient Greeks and Romans. This course considers the methods, history and results of archaeological research through the examination of a number of specific topics, which vary somewhat from year to year. Such topics may include Minoan and Mycenaean civilizations, archaeology and Homer, Greek and Roman architecture, sculpture and painting, and burial practices in various periods.

150 Freshman Seminar in Greek and Roman Myths
Fall or spring. 3 credits. Staff. An introductory course on the myths of Greece and Rome for students interested in acquiring a basic background in Greek and Roman myths and legends as they occur in ancient literature and art. It should serve as a foundation for those interested in pursuing various theories as well as those seeking to improve their grasp of mythical motifs in later European and American literature. The primary purpose will be to acquaint the student with the stories themselves.

211 The Greek Experience
Fall. 3 credits. M W F 2:30. M. Cook. An introduction to the literature and thought of ancient Greece. Topics will include epic and lyric poetry, tragedy and comedy, and historical, political, philosophical, and scientific writings. Some attention will also be given to the daily life of ordinary citizens, supplemented by slides of ancient art and architecture.

[212 The Roman Experience ]
217 Initiation to Greek Culture Fall. 4 credits. This course, and 218 in the spring (see below), is intended especially for freshmen: a few exceptionally motivated sophomores or upperclassmen may be accepted. Apply in writing to the Chairman, Department of Classics, 120 Goldwin Smith Hall. Limited to 18 students.

Knowledge of Greek or Latin is not necessary, since all texts are in translation. What is necessary is the willingness to participate in three one-hour seminars each week and also a supplementary one-hour (occasionally two-hour) session, during which the class will audit and discuss Greek or Latin plays (on videotape), produce readings of works like Platonic dialogues, tragedies, comedies, satire, and courtroom speeches; visit museums; and participate in workshops with specially invited guests.

The Archaic Age of Greece saw the flowering of Greek poetry and the birth of Western science and philosophy: in no other period were questions about the nature and limits of poetic truth and the foundations and possibility of rational thought raised with such intensity as in the 6th century B.C. The purpose of this course is to introduce to the student to the vast range of ancient Greek thought as its theme "The Lyre of Truth: Early Greek Poetry and Philosophy." We will read selections from the poets and philosophers of the Archaic Age—Homer, Hesiod, the lyric poets, and pre-Socratic philosophers—in order to explore the complex relationship between poetry and the emerging concept of rational truth. We also will study the influence of the thought of the early Greeks such as Aeschylus, Herodotus, and Plato.

218 Initiation to Roman Culture Spring. 4 credits. M T W Th F 11:15. F. Ahl.
See the description of 217 above. Topics to be announced.

222 The Individual and Society in Classical Athens Spring. 3 credits. Prerequisite: Classics 211 or 220 or History 461 or 265 or permission of instructor. Not offered 1986–87.

From Classical Athens (fifth and fourth centuries B.C.) come many of the most outstanding achievements in Western civilization, art, philosophy, historical writing, and the sciences. This course will survey Athenian daily life and discuss Athenian society with a view to isolating aspects that facilitated the development of the individual and individual achievement. Topics will include family life, education, economics, government, material culture, religion, and social structure. Political and military history, while not totally disregarded, will not be of primary concern.

224 Greek Philosophy Fall. 3 credits. Not offered 1986–87
An introduction to the pre-Socratic philosophers and Plato.

225 Hellenistic and Roman Philosophy Spring. 4 credits.
An introduction to late Greek and Roman philosophy, including Epicureans, Stoics, and Skeptics. Topics include philosophy of language and epistemology, materialism, personal identity, free will and necessity, and ethical naturalism.

235 Modern Greek Poetry and Politics (also Comparative Literature 336) Fall. 3 credits. M W F 1:25. G. Holst-Warhaft.
Modern Greece has one of the richest traditions of poetry in Europe. Kavafy, Kazantzakis, and the two Nobel prizes from Saffo to Sikelianos belong to a grand flourishing of letters that began in Greece before the Second World War. In this course, the first course of its kind taught at Cornell, the work of the modern Greek poets will be studied in the context of modern Greek politics from 1821 onwards. The survival of ancient Greek myths in modern Greek poetry will be discussed, and the course will examine the use of poetry in modern Greek political and protest songs, particularly those of Theodorakis. Recent works by Greek women writers will also be included.

236 Greek Mythology (also Comparative Literature 236) Fall. 3 credits. TR 8:40–9:55. Staff.
A survey of the Greek myths, with emphasis on the myths themselves, that have entered the pastochanical Western tradition. Of the aspects of mythology to be studied the following will be among the most important: what "myth" meant to the Greeks; the factors and influences involved in the creation of myths; and the significance of myths in daily life, religion, and thought. Comparison and contrast to Roman myths will also be included.

237 Greek and Roman Mystery Religions Spring. 3 credits.
The development and character of Mystery cults from the original Mysteries of Demeter and Persephone to the Christian Mysteries. The cults include the Kabiroi, the Great Gods of Samothrace, Dionysus, Osiris, and other cults of Asia Minor and the Near East. Investigation will focus on the distinctive features of the Mystery cults that contributed to their success.

238 The Ancient Epic Fall. 3 credits. Not offered 1986–87.
A close reading of the Homeric epics and Vergil's Aeneid. The Iliad and the Odyssey will be considered as oral poetry and in terms of their place in a traditional society but with reference to modern interpretations. The Aeneid will be read as a major rewriting of Homer designed for a new audience.

245 Greek and Roman Historians Spring. 3 credits.
TR 2:30–3:45. J. Ginsburg.
Study of historical writing in antiquity through selected readings in translation from the Greek and Roman historians. Among topics to be examined are the historian's task as understood by the ancients; the method, narrative technique, and accuracy of the Greek and Roman historians; and their attitudes toward the events that they relate.

300 Greek and Roman Drama: Greek Tragedy (also Comparative Literature 300) Spring. 4 credits. Not offered 1986–87.
M W F 2:30. K. Clinton.
The tragedies of Aeschylus, Sophocles, and Euripides, read in translation. The main emphasis will be on the form of the dramas and on their meaning in the fifth century B.C. and today. Consideration will also be given to the development of the Greek theater (illustrated with slides) and the origins of tragedy.

333 Latin Foundations of Western Literature (also Comparative Literature 333) Spring. 4 credits. Not offered 1986–87.

334 The Pastoral World (also Comparative Literature 334) Spring. 4 credits. M W F 2:30. N. Krevans.
A study of pastoral, beginning with Theocritus and Vergil and tracing the development of the genre in the English and continental traditions. All reading will be available in translation. Among the questions to be considered will be the origins of pastoral, pastoral and pastoral religious violence, and the role of the city in the pastoral world. In addition, the course will pay particular attention to the problem of genre as exemplified in pastoral poetry. Is pastoral a genre? How is it related to epic? What is its role in the development of late classical literature? Post-Classical readings will include works by Spenser, Milton, Shakespeare, Petrarch, Cervantes, and Ronsard.

336 Foundations of Western Thought (also Comparative Literature 336) Fall. 4 credits. Not offered 1986–87.
The Greeks and Romans first raised many of the central questions that have long preoccupied Western thinkers: Is belief in a god rational or just a matter of faith? Are there objective ethical and political values? Are we responsible for our actions if everything in the world is causally determined? What is the relation of science and politics, and how is scientific thinking distinguished from myth? We will examine the cultural, political, and religious contexts in which such questions first arise and assess the distinctively Greek and Roman responses given by Classical tragedians, historians, philosophers, and religious thinkers. Authors examined will include Homer, Heraclitus, Aeschylus, Sophocles, Thucydides, Plato, Aristotle, Epicurus, the Stoics, St. Paul, and Augustine.

337 Ancient Philosophy of Science Spring.
Hours to be arranged. M. Cook.
The development of scientific method by the ancient Greeks; the pre-Socratic philosophers, Aristotle, the ancient atomists, and the medical writers (Hippocrates, Galen, and the empiricists).

339 Ancient Witt: An Introduction to the Theory and Form of Comic and Satiric Writing in Greece and Rome (also Comparative Literature 339) Fall. 4 credits. Not offered 1986–87.
F. Ahl.
The aim is not only to provide an introduction to the comedy, satire, and other humorous writing in Greek and Roman literature, but to discuss the ancient works in light of modern theories of comedy and laughter. Discussion of the nature of laughter itself is in light of both ancient and modern scholarship on the subject, from Plato's Philebus but with reference to modern interpretations. The Aenid will be read as a major rewriting of Homer designed for a new audience.

340 Ancient Greek Constitutions Fall. 3 or 4 credits (3 credits for the Tuesday seminar in translation; an additional credit for the Thursday section for those who can read Greek). Prerequisite: one of the following: survey of Greek history, a course in Greek civilization, ability to read Greek, or permission of instructor.
The Greek word politeia means "constitution," but not a single written document. It means the form of political life within a state. This course will survey briefly the variety of forms of political life in ancient Greece from the time of Homer to the classical fourth-century Athenian democracy. The majority of time will be devoted to the history, functioning, and assessment of the Athenian democracy and Athenian law. The second major topic will be the constitution of Sparta and its role as the alternative to democracy. As each constitution is studied, the role of women and ideas of justice within the state will be considered. Required readings will be in translation. For those who can read Greek, an additional hour will be arranged each week to study selected documents in the original.

L. Abel, J. Ginsburg.
In this course students will examine the evidence about the social and political position of women in ancient Greece and Rome. The purpose will be to trace the origins of some Western attitudes about women and to address the long standing questions about evidence and problems in using literature and historical writing to assess social roles.

465–466 Independent Study in Classical Civilization, Undergraduate Level 465, fall; 466, spring. Up to 4 credits. Hours to be arranged. Staff.
126 Arts and Sciences

[610 Language of Myth (also Anthropology 610) Spring. 4 credits. Not offered 1986–87
P. Pucci. An analysis of the theories on language leading to Levi-Strauss and Derrida.]

[681 Patristic Seminar: Graduate Fall or spring. 4 credits. Not offered 1986–87]

711–712 Independent Study for Graduate Students in Classical Civilization 711, fall; 712, spring. Up to 4 credits. Hours to be arranged. Staff.

Greek

101 Greek for Beginners Fall or summer. 4 credits. MT W F 12:20. M. Cook. Introduction to Attic Greek. Designed to enable the student to read the ancient authors as soon as possible.

103 Attic Greek Fall, spring, or summer. 4 credits. Prerequisite: Classics 101 or equivalent. MT W F 12:20. Fall: A. Nussbaum; spring: A. Mitsis. A continuation of Classics 101.

104 Intensive Greek Spring. 6 credits. MT W F 9:05 and TR 8:40–9:55. Staff. This course combines in one term Classics 101 and 103.

[111–112 Modern Greek 111, fall; 112, spring. 3 credits each term. Not offered 1986–87
MT W F 9:05. G. M. Messing.]

201 Attic Authors Fall. 3 credits. Prerequisite: Classics 103 or equivalent. MT W F 1:25. R. Thomas. Euripides’ Medea and selected readings from Plato and other prose writers.

203 Homer Spring. 3 credits. Prerequisite: Classics 103 or equivalent. MT W F 9:05. P. Pucci. Readings in the Homeric epic with emphasis on formulaic style.

[204 Plato Spring. 3 credits. Prerequisite: Classics 103 or equivalent. Not offered 1986–87
MT W F 1:25. Staff. Selected readings from Plato.]

[209 Greek Composition Fall. 3 credits. Prerequisite: Classics 203 or equivalent. Not offered 1986–87
TR 10:10–11:25. Staff.]

210 Greek Composition Spring. 3 credits. Prerequisite: Classics 209 or equivalent. Not offered 1986–87

[301 Greek Historians Fall. 4 credits. Prerequisite: Classics 203 or equivalent. Not offered 1986–87
MT W F 1:25. M. Cook. Topic varies. Most recently the course consisted of reading (in Greek) and study of selected passages from Herodotus.]

302 Greek Tragedy Fall. 4 credits. Prerequisite: Classics 203 or equivalent. TR 10:10–11:25. P. Pucci. During this course we will study one play of Sophocles and two of Euripides. We will analyze the typical forms and conventions of tragic language and the specific styles of Sophocles and Euripides.

[303 Readings in Greek Rhetoric Fall. 4 credits. Not offered 1986–87
MT W F 9:05. P. Mitsis. An examination of the development of Greek rhetorical theory and practice from Antiphon to Dinarchus. Consideration will be given not only to the methods and techniques of Attic oratory but also to its legal and political context. These texts will also be studied as important sources for the Greeks’ views on such ethical questions as the nature of responsibility, moral obligations between citizens, and the morality of war.]

[305 Attic Comedy Fall. 4 credits. Prerequisite: Classics 203 or 204 or equivalent. Not offered 1986–87
MT W F 2:30. P. Mitsis.]

[306 Greek Melic, Elegiac, and Bucolic Poetry Spring. 4 credits. Prerequisite: Classics 203 or 204 or equivalent. Not offered 1986–87

308 New Testament Greek Fall. 4 credits. Prerequisite: at least one year of college-level Greek or permission of instructor. TR 8:40–9:55. G. Messing. Selected readings from the Gospels and other New Testament writings will be aimed at giving students the ability to translate Koine Greek with relative ease.

310 Greek Undergraduate Seminar: Aeschylus’s Oresteia Spring. 4 credits. Prerequisite: one 300-level course in Greek or permission of instructor. TR 10:10–11:25. K. Clinton. A study of Aeschylus’s great trilogy: reading of the text and discussion of Aeschylus’s literary art and the meaning of the plays.

340 Ancient Greek Constitutions Fall. 4 credits. Prerequisite: at least one of the following: survey of Greek history, a course in Greek civilization, ability to read Greek, or permission of instructor. TR 12:20–1:25, R. 12:20–1:10. L. Abel. See description under Classical Civilization.

401–402 Independent Study in Greek, Undergraduate Level 401, fall; 402, spring. Up to 4 credits. Hours to be arranged. Staff.

417 Advanced Readings in Greek Literature Fall. 4 credits. Intended for advanced undergraduates and graduate students. Prerequisite: two terms of 300-level Greek or permission of instructor. TR 12:20–1:35. P. Pucci. We will read the whole Odyssey and analyze the themes of return, polytropy, metis, and mythologeuein.

418 Advanced Readings in Greek Literature Spring. 4 credits. Intended for advanced undergraduates and graduate students. Prerequisite: two terms of 300-level Greek or permission of instructor. Hours to be arranged. M. Cook.

419 Advanced Greek Composition Spring. 3 credits. Prerequisite: Classics 209–210 or equivalent. TR 8:40–9:55. G. Messing.

[442 Greek Philosophy Fall or spring. 4 credits. Not offered 1986–87]

[605–606 Graduate Survey of Greek Literature 605, fall; 606, spring. 4 credits each term. Prerequisite: linguistic proficiency to be determined by instructor. Not offered 1986–87; next offered 1987–88. 3 hours per week, to be arranged. Staff. A survey of Greek literature in two semesters. Classics 605: Greek literature from Homer to the mid-fifth century. Classics 606: Greek literature from the late fifth century to the Empire.]

671 Seminar in Greek (Hellenistic Poetry): Graduate Fall. 4 credits.

672 Seminar in Greek: Graduate Spring. 4 credits.

701–702 Independent Study for Graduate Students in Greek 701, fall; 702, spring. Up to 4 credits. Hours to be arranged. Staff.

Latin

105 Latin for Beginners Fall or summer. 4 credits. MT W F 10:10. F. Ahl; MT W F 2:30, K. Clinton; MT W F 1:25, staff. An introductory course in the essentials of the Latin language, designed for rapid progress toward reading the principal Latin writers.

106 Elementary Latin Fall. Spring, or summer. 4 credits. Prerequisite: Classics 105 or placement by departmental examination. MT W F 9:05, D. Simpson; Spring: MT W F 8, 11:15, or 1:25.

A continuation of Classics 105, using readings from various authors.

107 Intensive Latin Spring. 6 credits. MT W F 9:05 and TR 8:40–9:55. A. Nussbaum. This course combines in one term Classics 105 and 106.

205 Intermediate Latin Fall. 3 credits. Prerequisite: Classics 106 or 105 or placement by departmental examination. MT W F 10:10, N. Krevans; MT W F 1:25, J. Ginsburg.

207 Catullus Spring. 3 credits. Prerequisite: Classics 106 or 105 or one term of 200-level Latin. MT W F 10:10. N. Krevans. Readings from Catullus’s poetry, with emphasis on the traditions of love poetry, the poet’s relation to his society, and other literary topics.

208 Roman Drama Spring. 3 credits. Prerequisite: Classics 106 or 105 or one term of 200-level Latin. Not offered 1986–87.

216 Vergil Spring. 3 credits. Prerequisite: one term of 200-level Latin. MT W F 10:10. N. Krevans.

241 Latin Composition Fall. 3 credits. Prerequisite: Classics 106 or 105 or one term of 200-level Latin. M W F 2:30–3:45. J. Ginsburg.

242 Latin Composition Spring. 3 credits. Prerequisite: Classics 241 or equivalent. Not offered 1986–87.

[312 Latin Undergraduate Seminar Fall or spring. 4 credits. Prerequisite: two terms of 200-level Latin or permission of instructor Not offered 1986–87]

314 The Augustan Age Fall. 4 credits. Prerequisite: two terms of 200-level Latin or permission of instructor. MT W F 1:25. D. Mankin.
Horace’s Odes and Epodes. We will read selections from the Odes and Epodes and focus especially on the historical context and literary background of these works.

315 Roman Satire Spring. 4 credits. Prerequisite: two terms of 200-level Latin or permission of instructor. MT W F 12:20. D. Mankin.
Horace’s Satires. We will read selections from Horace’s Satires as well as his Ars Poetica. Special attention will be paid to Horace’s contribution to the development of satire as a literary genre.
Anatolia, Greece, and the Near East; the rise of civilization in Egypt; the Bronze Age states of Syria-Palestine (Ebla, Ugarit, Byblos, etc.); Cyprus, copper, and the Allassa question; the Hittites and Bronze Age Anatolia; the early Bronze Age in Greece: Minoans, Mycenaenians, and their eastern and western contacts; the Bronze Age in the western Mediterranean; and ancient ships and trade in the late Bronze Age.

220 Introduction to Classical Archaeology (also History of Art 220) Spring. 3 credits. M.W.F. 9:05. A. Ramage. The sculpture, vase painting, and architecture of the ancient Greeks are studied from the Geometric period through the Hellenistic, and the art of the Romans from the early Republic to the late Empire.

233 Archaeology in Action II (also Archaeology 233) Spring. 3 credits. Prerequisite: permission of instructor. M.2:30, two labs to be arranged. P.I. Kuniholm. Objects from the Classical, Hellenistic, and Roman periods are "dug" out of Cornell basements, identified, cleaned, restored, catalogued, and photographed and are considered in their appropriate historic, artistic, and cultural contexts.

309 Dendrochronology of the Aegean (also Archaeology 309) Fall or spring. 4 credits. Limited to 10 students. Prerequisite: permission of instructor. M.2:30, two labs to be arranged. P.I. Kuniholm. Participation in a research project of dating modern and ancient tree-ring samples from the Aegean and Mediterranean. Supervised research and laboratory work. A possibility exists for summer fieldwork in Greece or Turkey.

320 Arts and Monuments of Athens (also History of Art 320) Spring. 4 credits. Prerequisite: Classics 220 or permission of instructor. Not offered 1986-87.

321 Archaeology of Cyprus (also History of Art 321) Spring. 4 credits. Prerequisite: Classics 220 or permission of instructor. Not offered 1986-87. Study of Cyprus from its first settlement in the Neolithic period until the end of the ancient world. Special emphasis on the Bronze Age, the acme of Cypriot civilization, and the neighboring civilizations. Lectures and oral reports by students. Students will have the opportunity to examine and study original unpublished material from the Cornell-Harvard excavations at Alambra and study the collection.

322 Greeks and Their Eastern Neighbors (also History of Art 322) Fall. 4 credits. Prerequisite: Classics 220 or 221, or permission of instructor. M.W.F. 12:20. A. Ramage. A study of the archaeological and other evidence for the interaction between Greek civilization and the eastern and western Mediterranean from the thirteenth to the fourth centuries B.C.E. The course will focus on Greek relationships with Phoenicia and the rest of the Levant, Cyprus, Anatolia, and the Etruscans in the post-Bronze Age period.

323 Painting in the Greek and Roman World (also History of Art 323) Spring. 4 credits. Not offered 1986-87.

325 Greek Vase Painting (also History of Art 325) Spring. 4 credits. Not offered 1986-87.


350 Arts of the Roman Empire (also History of Art 350) Spring. 4 credits. M.2:30. J. Coleman. The visual arts in the service of the first world state. The course starts with the Etruscan and Roman period but concentrates on monuments of the imperial era in Italy and the provinces until the time of Constantine.

356 Field Methods in Archaeology (also Archaeology 356) Spring. 4 credits. Prerequisite: one previous course in archaeology. TR 10:10-11:25. J. Coleman. Methods and techniques of archaeological survey and excavations and the study and recording of artifacts. The theoretical foundations will be considered as well as a wide variety of illustrative issues and problems. Special emphasis on the Mediterranean. Recommended for students who want to participate in the Cornell field project at Halai in Greece in summer 1987.

423 Ceramics (also History of Art 423) Spring. 4 credits. Prerequisite: permission of instructor. Not offered 1986-87.

431 Greek Sculpture (also History of Art 431) Fall. 4 credits. Not offered 1986-87.

432 Sardis and the Cities of Asia Minor (also History of Art 432) Spring. 4 credits. Prerequisite: permission of instructor. T-R 10:10-11:25. J. Coleman. The growth and interaction of the Greek and Roman cities and their art will be studied using the finds and conclusions from the Cornell-Harvard excavations at Sardis as a focal point. The magnificent works of art and architecture will be set beside domestic remains and objects of daily life. We shall examine local themes in the context of the history, topography, and the larger political and economic scene in Asia Minor. Topics will range over a long period, from the late Bronze Age to the early Byzantine era.
Honors Courses

370 Honors Course Spring. 4 credits. To be taken in the junior year.
A program of reading and conferences centered on an author or topic chosen in accordance with the special interests of the student and instructor.

471 Honors Course Fall. 4 credits. To be taken in the senior year.
A continuation of Classics 370, with change of author or topic.

472 Honors Course: Senior Essay Spring. 4 credits. For students who have successfully completed Classics 471.
Topics must be approved by the student's honors committee at the end of the first term of the senior year.

Related Courses in Other Departments
See listings under:
Archaeology Program
Comparative Literature
English
History
History of Art
Medieval Studies
Modern Languages and Linguistics
Near Eastern Studies
Philosophy
Society for the Humanities
Women's Studies

Comparative Literature


The Department of Comparative Literature provides a wide range of courses in European as well as non-European literatures. Courses vary significantly in level and type. The departmental offerings reflect current interdisciplinary approaches to literary study, hermeneutics, rhetorical analysis, semiotics, deconstruction, Marxism, reception aesthetics, feminism, formalism, and psychoanalysis.

The Major
The major enables students to develop an integrated knowledge of Western literature, to strengthen their reading and writing abilities, and to prepare for careers demanding analytical, interpretive, and evaluative skills. Prospective majors should consult with the director of undergraduate studies. After declaring a major, a student chooses an adviser from the department's faculty. The requirements for the major are designed to allow each student to follow a course of study that combines intellectual rigor with personal interests. The specific contours of such a program are worked out in consultation between student and adviser.

Requirements for the Major
1) Five courses in Comparative Literature at the 200 level and above, including the core course listed below. A student may include up to two literature courses from other departments.

2) One core course in Comparative Literature for 1986-87 the core courses are Comparative Literature 430 [fall] and Comparative Literature 431 [spring], to be taken by all majors in either the spring term of their junior year or the fall term of their senior year.

3) Five courses in literature or other areas of the humanities at the 200 or higher level, to be taken in one or more foreign literature departments. Texts must be read in the original language. A student may offer one language course (conversation, composition).

4) A senior essay (Comparative Literature 493-494) of roughly fifty pages, to be written during the senior year under the direction of the student's adviser.

The department also encourages:
1) A program that includes broad historical coverage (e.g., Comparative Literature 201-202, Great Books), intensive study of a single genre (e.g., Comparative Literature 363-364, The European Novel, and Comparative Literature 352, Classic and Renaissance Drama); analysis of problems in literary theory (e.g., Comparative Literature 295, Introduction to Semiotics; Comparative Literature 381, Marxist Cultural Theory, and Comparative Literature 403, History of Literary Theory);
2) A second foreign language, especially for those students interested in graduate work in literature.

Honors
A student who completes the requirements for the major is eligible for the degree of Bachelor of Arts with honors in comparative literature. The department bases its decision on the student's achieving grades of at least B+ in the senior essay and in course work for the major, and on overall academic performance at Cornell.

Freshman Seminars
Any 100-level course may be used toward satisfying the Freshman Seminar requirements. Full descriptions of Freshman Seminar Program offerings may be found in the program's listings in the section "Special Programs and Interdisciplinary Studies."

Courses

201-202 Great Books Fall: 4 credits. To be taken in the fall term of the student's junior year or the spring term of their junior year or the fall term of their senior year.

201-202 Great Books Spring: 4 credits. To be taken in the spring term of the student's junior year or the fall term of their senior year.

235 Modern Greek Poetry and Politics (also Classics 235) Fall. 3 credits.
Modern Greece has one of the richest traditions of poetry in Europe. Kavafy, Kazantzakis, Seferis, and Eliot all belong to a flourishing of letters that began in Greece before the Second World War. In this, the first course of its kind taught at Cornell, the work of the modern Greek poets will be studied in the context of modern Greek politics from 1821 onwards. The survival of ancient Greek myths in modern Greek poetry will be discussed, and the course will examine the use of poetry in modern Greek political and protest songs, particularly those of Theodorakis. Recent works by Greek women writers will also be studied.

236 Greek Mythology (also Classics 236) Fall. 3 credits.
A survey of the Greek myths, with emphasis on the myths that have entered the postclassical Western tradition. Literature and mythology to be studied, the following will be among the most important: what "myth" meant to the Greeks; the factors and influences involved in the creation of myths; and the significance of myths in daily life, religion, and thought. Comparison and contrast to Roman myths will also be included.

270 The Reading of Fiction (also English 270) Fall, spring, or summer. 3 credits. Each section limited to 15 students. May be used to satisfy either the Freshman Seminar requirement or the distribution requirement in the humanities, but not both. Upperclassmen students admitted as space permits.


Forms of modern fiction, with emphasis on the short story and novelia. Critical study of works by English, continental, and American writers from 1860 to the present—Bellow, Borges, Chekhov, Conrad, Faulkner, Joyce, Kafka, Mann, Weyt, and others.

302 Literature and Theory (also English 302) Fall. 4 credits.

This introductory course in contemporary literary theory will investigate assumptions behind current approaches to literature while surveying recent writing in what is called "theory." In addition to discussing competing views of the nature of literature and of critical method, we will consider the impact on literary study of such theoretical movements as structuralism, deconstruction, Marxism, and feminism, and the relations between literary study and other disciplines, such as anthropology, linguistics, philosophy, historiography, and psychoanalysis, whose theoretical writings have frequently stimulated work in literary studies. Lectures will attempt to elucidate different theoretical texts by such authors as Barthes, Derrida, De Man, Foucault, and Lacan. There will be a midterm, a paper, and a final examination.

326 Christianity and Judaism Spring. 4 credits. Not open to freshmen.


328 Literature of the Old Testament Fall. 4 credits. Not open to freshmen.


Analysis of selected material in translation.

329 The Spanish Civil War in Literature and the Visual Arts (also Spanish 329) Fall. 4 credits.


Focusing on the international response to the Spanish Civil War as reflected in fiction, poetry, painting, and film, this course will examine such issues in literary and visual representation as the conjunct and contrast between documentary and fictional techniques and the rhetoric of images. Writers and artists whose works will be considered include Orwell, Mauxa, Hemingway, Spender, Neruda, Picasso, and Saura.

334 The Pastoral World (also Classics 334) Spring. 4 credits.

N. Krevans.

A study of pastoral, beginning with Theocritus and Virgil and tracing the development of the genre in the English and continental traditions. All reading will be available in translation. Among the questions to be considered will be the origins of pastoral, pastoral as political/religious allegory, and the role of the city in the pastoral. In addition, the course will pay particular attention to the problem of genre as exemplified in pastoral poetry. Is pastoral a genre? How is it related to epic or drama? Post-Classical readings will include works by Spenser, Milton, Shakespeare, Petrarch, Cervantes, and Ronsard.

334 Medieval Literature Fall. 4 credits.


Reading the classical interpretation of Beowulf; the Nibelungenlied; Njalssaga; Chretien's Yvain; Wolfram's Parzival, and Sir Gawain and the Green Knight. Midterm and final exam and a 2,500-word paper.

344 Dante's Divine Comedy (also Italian 334) Fall. 4 credits.


Intensive study of textual and poetic in relation to the culture and history of medieval Europe. Major topics: Dante and premordem theories of autobiography, theology and poetics in the Comedy. Dante and the natural sciences. Analysis of classical epic (Virgil, Lucan Stalianus), and the Comedy and Dante's minor works. Conducted in English, and readings are in translation.

352 Classic and Renaissance Drama (also Theatre Arts 325) Spring. 4 credits.

M W F 1:25. A. Caputi.

A study of the major traditions in Western drama from the beginnings among the Greeks to the Renaissance in England and Spain. The work will consist of both lectures and discussions focusing primarily on a close reading of the plays. But we shall also give attention to the theoretical background of production and to social and political contexts. Among the authors to be read will be Aeschylyus, Sophocles, Euripides, Antonphanes, Marlowe, Shakespeare, and Lope de Vega.

353 European Drama, 1660 to 1900 (also Theatre Arts 326) Fall. 4 credits.


Reading, from major dramatists from Corneille to Chekhov, including such authors as Molieres, Congreve, Marlowe, Goldoni, Gozzi, Schiller, Kletz, Gogol, Ostrovsky, and Iosif.

354 Modern Drama (also Theatre Arts 327) Spring. 4 credits.


A study of the major currents of modern drama against the background of modern culture. Readings in major twentieth-century European dramatics from Claudel and Pirandelto to Beckett and Muller.

356 Literature of the European Renaissance Fall. 4 credits.


An introduction to Renaissance literary texts with some attention to cultural, social, and political history. Readings from Machiavelli, Erasmus, Rabelais, Shakespeare, Cervantes, and others.

363–364 The European Novel Fall. 363, Fall. 4 credits. Comparative Literature 363 and 364 may be taken independently of each other.


Close reading of European and Continental novels from 1600 to 1950. 363: Cervantes to Dostoevsky. 364: Tristoy to Gide. The novels to be studied include Voltaire, Scott, Stendhal, Balzac, Goethe, Flaubert, Hardy, Mann, and Nabokov. Analysis of novelistic subgenres: picaresque fiction, historical novel, moral tale, recit, detective story, and Bildungsroman.

370 Poetry of the late Eighteenth and Nineteenth Century Spring. 4 credits.


A study of German classicism (Goethe, Holderlin), English romanticism (Wordsworth, Coleridge), and French symbolism (Baudelaire, Rimbaud), with attention to problems of literary classification and periodization. Foreign texts may be read in translation.

381 Marxist Cultural Theory (also German 381) Fall. 4 credits.


A historical survey of leading European Marxist thinkers, offering a critical perspective on culture, particularly in relation to ideology. Mainly a close reading of selected texts, but with consideration of historical contexts as well. Some emphasis on aesthetics and especially literary theory. Readings from Marx, Engels, Lukacs, Gramsci, Brecht, Benjamin, Horkheimer, Adorno, Marcuse, Sartre, Althusser, and Williams.

387 Teaching and Learning: Ideas of Education in the Western Tradition (also Russian Literature 387) Spring. 4 credits.

M W 2:30–4:30 plus one hour to be arranged. P. Carden and guest lecturers. Education is a central theme in our cultural tradition. What makes a person educated? Should a child be taught to benefit society or to benefit some notion of his own good? What makes a good teacher? Should we have schools and, if so, what kind? What role should the state play in determining what to teach and how it should be taught? These and other questions are fundamental to our philosophical discourse from Plato to Rousseau. Fiction takes school and learning as primary subjects, and narrative has developed under the influence of the pedagogical discourse. Public policy is shaped by the debate over teaching and learning. Writing shapes education, both as a vehicle of pedagogical discourse and as a necessary practice at every level of education. These topics will be the focus of our discussion as we look at a number of texts from the philosophical, literary, and public policy discourse.

388 Ideas and Form in Novels of Social Inquiry (also Russian Literature 388) Fall. 4 credits.

M W 9:05. G. Gibian.

From the French Revolution to the present. Literary representations of conflict between political ideologies (ideology of revolution, justice, nationalism) and private needs (art, nature, love, order). Marx, Flaubert, Dostoevsky, Conrad, Henry James, Trotsky, Lenin, V. S. Naipaul, Solzhenitsyn, and Kundera. Some poetry will also be included.

400 The Japanese Noh Theatre (also Asian Studies 400) Fall. 4 credits.


Several weeks will be spent in studying the literary, performance, and aesthetic aspects of the noh theater. Emphasis will be on noh as a performance system, a total theater which music, dance, and mask and prop interact to create the total effect. Then attention will turn to modern theater people who have reacted to noh in some creative way. Choice of dramatists will depend partly on student interests but will probably include West, Brecht, Britten, Claudel, Giraudoux, and Mishima. All readings may be read in English translation.

401 The Afro-American Literary Tradition (also African Studies and English 401) Fall. 4 credits. Limited to 15 students with strong preparation in literature.

TR 12:20–1:35. H. Gates.

This course explores the emergence and formal development of the Afro-American literary tradition from the eighteenth to the twentieth century. Close reading of the principal texts in the tradition, and their structural and historical relationships, will be stressed. Authors include Phillis Wheatley, Frederick Douglas, Harriet Jacobs, Booker T. Washington, James Weldon Johnson, Jean Toomer, Richard Wright, Zora Neale Hurston, Ralph Ellison, Toni Morrison, Alice Walker, Gloria Naylor, Amiri Baraka, Gwendolyn Brooks, and others.

402 Theories of Rhetoric (also Comparative Literature 602) Fall. 4 credits.


Reading and discussion of theories about rhetoric and its relation to literature and other forms of discourse. Texts by Plato, Longinus, Nietzsche, Derrida, and others.

409 Freud as Imaginative Writer and Reader (also English 409) Fall. 4 credits.

TR 12:20–1:35. C. Chase.
How is the dominant theory of mind in the modern period marked by its origins in Freud's involvement with imaginative writing? In this seminar we will explore the forms and consequences of this involvement, including the nature of Freud's own writing—case histories that read like novels, theoretical works that read like speculations on the origins of language—and his readings into the Sophocles' Oedipus and E. T. A. Hoffmann's story "The Sandman." We will question how and why Freud's writing focuses on sexuality and on fantasy as the basic conditions of mind. Reading for this seminar will include the case histories of Dora, the Wolf Man, and Little Hans; Beyond the Pleasure Principle; and The Interpretation of Dreams: An interpretation of one of your own dreams may be one of several short papers for the course. No exam; one longer final paper.

410 Semiotics and Language (also Linguistics 406) Spring. 4 credits. Prerequisites: some background in linguistics, philosophy, psychology, anthropology, or literary theory, or permission of instructor.
An introduction to the study of semiotics in general and to particular semiotic theories (for example, those of Saussure, Peirce, Jakobson) and to language as a semiotic system.

418 Pedagogy and the Nineteenth-Century Novel (also Russian Literature 418) Fall. 4 credits. M. W. 2:30–4:30, plus one hour to be arranged.

P. Caplan.
Platonic thought affirms basic philosophical questions to pedagogy. How do we know? How do we learn? What education will produce worthy citizens and rulers? Rousseau's Emile took up the high philosophical tradition of pedagogy and recast it as a myth and as an incipient novel. In so doing, he opened the way to what we can call the great pedagogical novels of the nineteenth century. In this seminar we will examine the principles of a pedagogy designed to encompass the whole of life, as it is set forth in such works as Plato as Meno, Phaedo, Symposium, and Republic. We will also be introduced into the mainstream of philosophical thought by Rousseau's Emile and Schiller's Letters on Aesthetic Education. Then we will turn to several novels of the nineteenth century, among them Tolstoy's War and Peace, Dostoevsky's Notes from Underground, and D. H. Lawrence's A Sentimental Education, to see how the presuppositions of a philosophical pedagogy rooted in Platonic thought were tested by authors who found in the novel a vehicle for philosophical and pedagogical myths or for their debunking.

419–420 Independent Study 419, fall; 420, spring. Variable credit. Comparative Literature 419 and 420 may be taken independently of each other. Hours to be arranged. Staff.

421 Old Testament Seminar Fall. 4 credits. Limited to 20 students.
T 2:30–4:25. C. M. Carmichael.
The book of Genesis.

426 New Testament Seminar Spring. 4 credits. Limited to 20 students.
T 2:30–4:25. C. M. Carmichael.

429 Readings in the New Testament Fall. 4 credits. Limited to 25 students.
M W F 1:15. J. P. Bishop.
Close readings of representative texts from the New Testament in modern scholarly editions, with the help of appropriate introductory, introductory and specialized. The focus in 1986 will be the synoptic gospels, Mark, Matthew, and Luke. All readings will be in English, but repeated reference to the Greek original will be made. Group discussions will be held with students from other colleges who are interested in the material should not feel inhibited from enrolling. The approach will be primarily exegetical; that is, we will try to find out what the texts say and what they mean by what they say. Thus we can hope to stay open to scholarly and religious issues alike.

430 Poetry, Language, Politics Fall. 4 credits. Prerequisites: literature courses at the 200-level or above.
The aim of this seminar is to situate the American modernist and postmodernist poetics of Stevens, Ashbery and Bachelin, among and as against the nonrepresentational, language-oriented French poetic tradition of Mallarmé and Césaire and the self-consciously political orientation in German poetry represented by the generation of the nineteen thirty and the nineteen nineteen critics. Attention will be given to the question of mimesis and to problematic assumptions in the way we tend to conceive of relationships between language and perception and language and reality, as well as to the ideological and utopian situation of poetry in the twentieth century. Critical readings will include texts by Adorno, Bachelin, Derrida, Danto, Easthope, Jauss, and Rifaterre. All foreign-language texts may be read in translation.

431 Isms: General Concepts in Modern Cultural History (also Romance Studies 431) Spring. 4 credits.
An attempt to define humanism, baroque, classicism, romanticism, realism, Marxism, symbolism, surrealism, existentialism, structuralism, and poststructuralism. The meaning of general terms in the language of literary criticism. Literary criticism and literary history.

471 The Prose Poem Spring. 4 credits.
The twentieth century, and especially since 1945, the prose poem has emerged as a genre of international interest. Beginning with a close investigation of the rise of the prose poem in the nineteenth century, this seminar will explore the genre's characteristic features, development, and literary historical significance in France, Germany, and the United States. Readings will include works by Baudelaire, Rimbaud, Brecht, Eich, Bl, and Merwin and critical theoretical texts by Jameson, Bakhin, B. Johnson, and R. Tideman. Foreign-language materials may be read in translation.

493–494 493; fall, 494, spring. 3 credits. Hours to be arranged. Staff.

496 Fascism and Culture: Seminar on Fascist Modernism (also Italian 497) Fall. 4 credits.
The problem of Fascist modernism approached from within an interdisciplinary framework: (a) as a problem in the relation of politics and ideology to modern and postmodern culture; (b) in relation to contemporary theories of the avant-garde; (c) as an issue in twentieth-century poetics, mythology, and narrative; and (c) in relation to the larger problem of interpreting the Fascist movement as a whole. Major topics: Nietzsche, Sorel, and Fascism; Nietzsche of the individual and the mass subject; Fascism and futurism; Fascism and decadence; Fascist hermeneutics; and the Fascist ritualization of violence. Major authors: D'Annunzio, Marinetti, Celine, Pound, Riefenstein, and W. Lewis.

Dostoevsky, Mann, and Gide (also French 498) Fall. 4 credits.
The development of the novel form and of certain important themes as illustrated in some of the chief works of these three representative authors. Among others, Notes from the Underground, The Brothers Karamazov, Faustian, Lolita, and Adventures, and The Counterfeiter will be discussed.

602 Theories of Rhetoric (also Comparative Literature 402) Fall. 4 credits.
For description see Comparative Literature 402.

605 Introduction to Modern German Literary Theory with an Emphasis on Contemporary Criticism (also German Literature 605) Fall. 4 credits.
This seminar will offer a survey of German criticism from 1900 to the present. Emphasis will be on the period from 1968 to the present, and on the tendency to familiarize incoming graduate students with the main currents of German criticism. Readings will be taken from Heidegger, Staiger, Kalte Hamburger, Szondi, Adorno, Jauss, and others.

619–620 Independent Study 619, fall; 620, spring. Variable credit. Comparative Literature 619 and 620 may be taken independently of each other. Hours to be arranged. Staff.

630 Language, Knowledge, and Human Nature in the Eighteenth Century (also English 630) Spring. 4 credits.
Readings by Locke, Hume, Condillac, Rousseau, Oderot, and others. Reading knowledge of French will be assumed, although the French texts are available in English translation.

682 Afro-American Literature: Black Women and Their Fictions (also English 682 and Africana Studies 682) Fall. 4 credits.
This course intends to define the precise shape and contours of the tradition of Black women's writing in English. How do Black women use language to represent their experiences? How does their writing resemble or diverge from the Black male tradition? How does Black feminist theory differ from white feminist theory? Readings by Harriet E. Wilson, Frances Harper, Anna Julia Cooper, Nella Larsen, Zora Neale Hurston, Gwendolyn Brooks, Ann Petry, Paule Marshall, Toni Morrison, Toni Cade Bambara, Gayle Jones, Alice Walker, Gloria Naylor, and Jamaica Kincaid.

Computer Science


The Department of Computer Science is in both the College of Arts and Sciences and the College of Engineering. A student in either college can major in computer science. The following describes the College of Arts and Sciences major.

The Major

The major has three components: a core (a minimum of 42 credits), a group of electives in computer science and related fields (a minimum of 10 credits), and a concentration outside computer science (a minimum of 14 credits). The core focuses on the central topics within computer science: the logical design of programs, data structures, and algorithms. The remaining components of the major—the related electives and the outside concentration—provide a flexible extension to the core program. Students are expected to choose in consultation with their advisers the electives and the outside concentration that best suit their graduate and career plans.

Students interested in pursuing an advanced degree in theoretical computer science should concentrate in mathematics. Students preparing for advanced work in scientific computation should take Computer Science 621 (instead of Computer Science 222) and Computer Science 622 (a two-quarter sequence). Students interested in a branch of applied mathematics. Qualified students are encouraged to concurrently major in mathematics.
Admission

The prerequisites for admission to the major are:
1) completion of Computer Science 100–211–280 (or equivalent);
2) completion of Mathematics 111–122–221 or Mathematics 191–192–293;
3) a 2.75 grade-point average in all computer science and mathematics courses;
4) acceptance by the department's admissions committee.

After admission, students are expected to maintain at least a 2.75 grade-point average in their major courses. Any grade below C– in a core course or related elective is not acceptable.

Core

The core consists of the following courses:
1) calculus and linear algebra: Mathematics 111–122–221–222 or 191–192–293–294;
2) programming and systems: Computer Science 100, 211, 310, and 314;
3) theory of computation: Computer Science 280, 381, and 382. (One of the following may be substituted for Computer Science 280: Mathematics 332, 381, or 432.)
4) numerical analysis: Computer Science 222 or 421.

Related Electives

The related electives requirement consists of three courses. One must be a computer science course or course/laboratory combination numbered above 400 that includes a substantial programming project, for example, Computer Science 412, 414/415, 417, or 432/433; the other two are to be selected from the following:

- Electrical engineering courses numbered 230 or higher
- Operations research courses numbered 260 or higher
- Mathematics courses numbered 381 or higher
- Computer Science courses numbered 400 or above (except Computer Science 415, 433, and 600 and seminar courses)

Students are expected to select related electives that complement their concentration.

Concentration

This component encourages the student to study some discipline outside of computer science in reasonable depth. The concentration consists of an approved sequence of four courses (at least 14 credits) numbered 200 or higher in some field related to the theoretical or practical aspects of computing. A list of approved concentrations is available in the Computer Science Office, 405 Upson Hall. Students may also design their own concentrations, subject to the approval of their advisor. The concentration requirement is waived for students who concurrently major in a related field such as mathematics, linguistics, or psychology.

Other Requirements

Computer science majors must also satisfy the College of Arts and Sciences and University requirements. In particular, the spirit of the 15-credit elective requirement will be strictly followed. This requirement helps insure breadth of education, and consequently no computer- or mathematics-related course can be used toward its fulfillment. In general, no courses may be used to fulfill more than one requirement. There are two exceptions: first, appropriate core courses may be used to satisfy the group IV distribution requirement, and second, in the case of a double major, the same course may be applied to both majors.

Probability and statistics courses. Computer science majors are encouraged to include at least one course in the field of probability and statistics in their program of study. Although there is no formal department of statistics at Cornell, the Department of Mathematics and the School of Operations Research and Industrial Engineering offer a wide range of probability and statistics courses suitable for computer science majors, including the following introductory two-course sequences:

- Math 471: Basic Probability
- Math 472: Statistics
- ORIE 260, Introductory Engineering Probability
- ORIE 370, Introduction to Statistical Theory with Engineering Applications

A less rigorous but satisfactory one-semester introduction to probability and statistics is given in either of:

- Math 370, Elementary Statistics
- ORIE 270, Basic Engineering Statistics

Honors. A student may be granted honors in computer science upon the recommendation of the Computer Science Academic Affairs Committee. The committee guidelines will generally be the following:

1) an overall grade-point average of not less than 3.25
2) a grade-point average for all computer science courses of not less than 3.5
3) satisfactory completion of at least two computer science courses numbered above 600 or satisfactory completion of a significant special investigation (Computer Science 490).

Courses

For complete course descriptions, see the computer science listing in the College of Engineering section.

100 Introduction to Computer Programming (also Engineering 100) Fall, spring, or summer. 4 credits. Students who plan to take both Computer Science 101 and 102 and must take 101 or 102 first:
2 lecs; 1 rec (optional). 3 evening exams.

101 The Computer Age Spring or summer. 3 credits. Credit is granted for both Computer Science 100 and 101 only if 101 is taken first.
2 lecs; 1 rec. 1 evening exam.

102 Introduction to Microcomputer Applications (also Agricultural Engineering 102) Fall. 3 credits. Each lab section limited to 16 students. May be taken only for out-of-college credit by students in the College of Arts and Sciences. Not open to students in the College of Engineering or to students who have taken any prior computer courses at Cornell.
2 lecs, 1 rec, 1 lab. 2 evening exams.

211 Computers and Programming (also Engineering 211) Fall, spring, or summer. 3 credits. Prerequisite: Computer Science 100 or equivalent programming experience.
2 lecs, 1 rec. 2 evening exams.

222 Introduction to Scientific Computation (also Engineering 222) Spring. 3 credits. Prerequisites: Computer Science 100 and Mathematics 112, 122, or 192.
2 lecs. 3 evening exams.

280 Discrete Structures Fall or spring. 4 credits. Prerequisite: Computer Science 211 or permission of instructor.
3 lecs.

305 Social Issues in Computing Fall. 3 credits. Prerequisite: Computer Science 100 or permission of instructor.
2 lecs.

310 Data Structures Fall, spring, or summer. 4 credits. Prerequisite: Computer Science 260 or permission of instructor.
2 lecs. 2 evening exams.

314 Introduction to Computer Systems and Organization Fall, spring, or summer. 4 credits. Prerequisite: Computer Science 211 or equivalent.
2 lecs, 1 rec. 2 evening exams.

381 Introduction to Theory of Computing Fall. 4 credits. Prerequisites: Computer Science 280 or permission of instructor.
3 lecs.

382 Introduction to Analysis of Algorithms Spring. 4 credits. Prerequisites: Computer Science 310 and 381 or permission of instructor.
3 lecs.

400 The Science of Programming Spring. 4 credits. Prerequisite: CS 280 or equivalent.
3 lecs. D. Gries.

405 Science and the Computer Fall. 4 credits. Common Learning Course. Prerequisite: permission of instructor.

411 Programming Languages and Logics Spring. 4 credits. Enrollment limited. Prerequisites: Computer Science 310 and permission of instructor.
2 lecs.

412 Introduction to Compilers and Translators Fall. 4 credits. Prerequisite: Computer Science 314. Prerequisite or corequisite: Computer Science 381. Not offered every year.
3 lecs.

414 Systems Programming and Operating Systems Fall. 3 credits. Prerequisite: Computer Science 314 or permission of instructor.
2 lecs. 2 evening exams.

415 Practicum in Operating Systems Fall. 2 credits. Prerequisite: Computer Science 310. Corequisite: Computer Science 414.
1 lec.

417 Interactive Computer Graphics (also Architecture 374) Spring. 4 credits. Prerequisite: Computer Science 314.
2 lecs. 1 lab.

421 Numerical Solution of Algebraic Equations Fall. 4 credits. Prerequisites: Mathematics 294 or 222, one additional mathematics course numbered 300 or higher, and knowledge of FORTRAN at the Computer Science 222 level.
3 lecs.

432 Introduction to Database Systems Spring. 3 credits. Prerequisite: Computer Science 211 and 310 or permission of instructor. Recommended: Computer Science 314.
2 lecs, 1 rec.

433 Practicum in Database Systems Spring. 2 credits. Corequisite: Computer Science 432. 1 lab.

[484 Introduction to Symbolic Computation Spring. 4 credits. Prerequisites: Computer Science 481 or Mathematics 332 or 432 or permission of instructor. Not offered 1986–87.
2 lecs.]

486 Applied Logic (also Mathematics 486) Spring. 4 credits. Prerequisite: Mathematics 222 or 294, Computer Science 100, and an additional course in mathematics or theoretical computer science.
2 lecs, 1 lab to be arranged.

490 Independent Reading and Research Fall or spring. 1–4 credits.

600 Computer Science and Programming Fall. 1 credit. Prerequisite: graduate standing in computer science or permission of instructor.
1 lec.
132 Arts and Sciences

611 Advanced Programming Languages Fall. 4 credits. Prerequisite: Computer Science 310 or permission of instructor. 3 lecs.

612 Translator Writing Spring. 4 credits. Prerequisites: Computer Science 310 and 381 or permission of instructor. 3 lecs.

613 Concurrent Programming and Operating Systems Principles Winter. 4 credits. Prerequisites: Computer Science 414 and 600 or permission of instructor. 3 lecs.

614 Advanced Operating Systems Spring. 4 credits. Prerequisite: Computer Science 414 or permission of instructor. 2 lecs.

615 Machine Organization Spring. 4 credits. Prerequisite: Computer Science 314 or permission of instructor. Not offered 1986–87.

616 VLSI Algorithms Spring. 4 credits. Prerequisite: permission of instructor. 2 lecs.

621 Matrix Computations Fall. 4 credits. Prerequisites: Computer Science 421 and Mathematics 411 and 431 or permission of instructor. 3 lecs.

622 Numerical Optimization and Nonlinear Algebraic Equations Spring. 4 credits. 3 lecs.

632 Database Systems Fall. 4 credits. Prerequisites: Computer Science 310 and either Computer Science 432 or permission of instructor. 2 lecs.

635 Automatic Text Processing and Information Retrieval Spring. 4 credits. Prerequisite: Computer Science 310 or equivalent permission of instructor. 2 lecs.

643 Design and Analysis of Computer Networks Fall. 4 credits. Prerequisite: Computer Science 414 or permission of instructor. Not offered every year. 2 lecs.

652 Sparse Matrix Theory: Combinatorial Algorithms and Numerical Computation Spring. 4 credits. Prerequisites: Computer Science 621 and 681 or permission of instructor. Not offered every year. 2 lecs.

655 Mathematical Foundations for Computer Modeling and Simulation (also Mathematics 655) Fall. 4 credits. Prerequisite: Mathematics 431 and 432, or the equivalent in both content and level of mathematical sophistication or permission of instructor. 3 lecs.

661 Robotics Fall. 4 credits. Prerequisites: Computer Science 611 and 681 or permission of instructor. Not offered every year. 3 lecs.

662 Robotics Laboratory Fall 1 credit. Prerequisite: graduate standing or permission of instructor. 1 lab.

671 Introduction to Automated Reasoning Fall. 4 credits. Prerequisites: Computer Science 611 and 681 and Mathematics 581. 3 lecs.

681 Analysis of Algorithms Fall. 4 credits. Prerequisites: Computer Science 381 or permission of instructor. 3 lecs.

682 Theory of Computing Spring. 4 credits. Prerequisite: Computer Science 381 or permission of instructor. 3 lecs.

709 Computer Science Graduate Seminar Fall or spring. 1 credit. S-U grades only. For staff, visitors, and graduate students interested in computer science.

711 Topics in Programming Languages and Systems Spring. 4 credits. Prerequisites: Computer Science 381 and 611 or permission of instructor. Not offered every year. 2 lecs.

712 Topics in Programming Languages and Systems Spring. 4 credits. Prerequisite: Computer Science 612. Not offered every year. 2 lecs.

713 Seminar in Operating Systems Fall or spring. 4 credits. Prerequisite: Computer Science 613 or permission of instructor. Not offered every year.

714 Distributed Computing 4 credits. Prerequisites: Computer Science 414 and an advanced systems course (e.g., Computer Science 613, 614, 632, or 643). Not offered every year. 2 lecs.

715 Seminar in Programming Refinement Logics Fall or spring. 4 credits. Prerequisite: permission of instructor.

719 Seminar in Programming Fall or spring. 4 credits. Prerequisite: Computer Science 611 or permission of instructor. S-U grades only.

721 Topics in Numerical Analysis Fall. 4 credits. Prerequisite: Computer Science 621 or 622 or permission of instructor. Not offered every year. 2 lecs.

722 Topics in Numerical Analysis Fall or spring. 4 credits. Not offered every year. 2 lecs.

729 Seminar in Numerical Analysis Fall or spring. 4 credits. Prerequisite: permission of instructor. S-U grades only.

733 Selected Topics in Information Processing Not offered 1986–87.

734 Seminar in File Processing Fall. Credit to be arranged. Prerequisite: Computer Science 733 or permission of instructor. Not offered 1986–87.

739 Seminar in Text Processing and Information Retrieval Fall or spring. Credit to be arranged. Prerequisite: Computer Science 635 or permission of instructor. S-U grades only.

749 Seminar in Systems Modeling and Analysis Fall or spring. 4 credits. Prerequisite: permission of instructor. Not offered every year.

781 Topics in Analysis of Algorithms and Theory of Computing Fall. 4 credits. Prerequisites: Computer Science 681 and 682 or permission of instructor. S-U grades only. Not offered every year. 2 lecs.

782 Topics in Analysis of Algorithms and Theory of Computing Spring. 4 credits. Prerequisites: Computer Science 681 and 682 or permission of instructor. S-U grades only. Not offered every year. 2 lecs.

789 Seminar in Theory of Algorithms and Computing Fall or spring. 2–4 credits. Prerequisite: permission of instructor. S-U grades only.

790 Special Investigations in Computer Science Fall or spring. Prerequisite: permission of a computer science adviser.

890 Special Investigations in Computer Science Fall or spring. Prerequisite: permission of a computer science adviser. S-U grades only.

990 Special Investigations in Computer Science Fall or spring. Prerequisite: permission of a computer science adviser. S-U grades only.

Dutch

See Modern Languages, Literatures, and Linguistics.

Economics


The study of economics provides an understanding of the way economies operate and insight into public issues. The department offers a broad range of undergraduate courses in such fields as money and banking; international and comparative economics; econometrics; theory; history; growth and development; and the organization, performance, and control of industry.

The Major

Students who wish to major in economics must have completed Economics 101–102 or equivalent courses and Mathematics 111 or its equivalent with grades of C or better. Prospective majors should apply at the department office. Students considering a major in economics should take Economics 313 and 314 instead of Economics 311 and 312.

The requirements for a major are (1) Economics 319, 313, and 314 and (2) 20 credits of other economics courses listed by the Department of Economics, except that Economics 399 will not count toward the 20-credit requirement. With the permission of the major adviser, one or (in exceptional cases) two economics courses offered outside the College of Arts and Sciences may be applied to fulfill this requirement. Also with the major adviser’s permission, a statistics course offered by another department may be substituted for Economics 319.

An honors program is currently being offered. Students should consult the director of undergraduate studies before May in their junior year for more information.

Students planning graduate work in economics or business are strongly encouraged to prepare themselves well in mathematics and econometrics.

Courses

101 Introductory Microeconomics Fall, spring, or summer. 3 credits. Economics 101 is not a prerequisite for 102.

Lec. and disc. Explanation and evaluation of how the price system operates in determining what goods are produced, how goods are produced, and who receives income, and how the price system is modified and influenced by private organizations and government policy.
102 Introductory Macroeconomics Fall, spring, or summer. 3 credits. Economics 101 is not a prerequisite for 102.

Economics 311

Lect and disc.

Analysis of aggregate economic activity relative to the level, stability, and growth of national income. Topics discussed may include the determination and effects of unemployment, inflation, balance of payments deficits, and economic development, and how these may be influenced by monetary, fiscal, and other policies.

301 Economics of Market Failure Fall. 4 credits. Prerequisites: Economics 101–102.

The course will review briefly the welfare properties of the perfectly competitive market model and will then consider a range of situations in which these properties are modified and where there may be a case for some form of government intervention. The cases to be considered will include (a) the presence of externalities, pollution, and the economics of the environment; (b) the provision of public goods, the free-rider problem; (c) uncertainty and imperfect information, an analysis in the context of labor and insurance markets, and the market for medical care; (d) the regulation of natural monopoly and public utility pricing; (e) the failure of the market to achieve desired redistributal objectives; (f) direct and indirect taxation as instruments of redistribution.

302 The Impact and Control of Technological Change (also Government 302 and City and Regional Planning 440) Spring. 4 credits.

Examines social, environmental, and economic implications of technological change in the United States. The context of possible policies and strategies of control. Several specific cases will be considered in detail, followed by a broader investigation of the problems of a modern technological society. Alternative political-economic solutions will be explored.

303 Positive and Normative Theories of Income Distribution Spring. 4 credits. Enrollment limited. Prerequisite: Permission of instructor. Cannot be applied to the major.

After examining the distinction between the terms positive and normative as used in economics, this course will explore three main questions: (1) Why is income distributed the way it is? (2) How should income be distributed? (3) What is the relationship between income and consumption?

304 Economics and the Law Fall. 4 credits. Prerequisite: Economics 311 or 313 or permission of instructor.

An examination, through the lens of economic analysis, of legal principles drawn from a variety of legal fields, including contracts, property, torts, and procedure. No legal training is required.

306 Economics of Defense Spending Spring. 4 credits. Prerequisites: Economics 101–102.

The economic aspects of defense spending are analyzed. Emphasis is on the procurement of weapons systems. Topics covered include an overview of the defense budget, special characteristics of the defense industry, and the economic behavior of defense firms.

307 Introduction to Peace Science Fall. 4 credits. Prerequisites: Economics 101–102 or permission of instructor.

Introduction to theories and research on conflict resolution. Topics include conflict, its role and impact upon society, theories of aggression and altruism, causes of war: game theory, conflict management procedure and other analytical tools and methods of peace science; alternatives to war.

308 Economic Analysis of Government (also Civil and Environmental Engineering 322) Spring. 4 credits. Prerequisites: calculus plus Economics 313 or Civil and Environmental Engineering 321.

Analysis of economic bases for government intervention in a market economy. Topics include public goods, cost-benefit analysis, public finance, environment regulation and risk management, and macroeconomic topics.

309 Capitalism and Socialism (also Industrial and Labor Relations 347) Fall. 4 credits. Prerequisite: permission of instructor.

311 Intermediate Microeconomic Theory Fall, spring, or summer. 4 credits. Prerequisites: Economics 101–102 or permission of instructor.

The pricing processes in a private enterprise economy are analyzed under varying competitive conditions, and their role in the allocation of resources and the functional distribution of national income is considered.

312 Intermediate Macroeconomic Theory Fall, spring, or summer. 4 credits. Prerequisites: Economics 101–102 or permission of instructor.

The theory of national income determination and economic growth in alternative models of the national economy is introduced. The interaction and relation of aspects of these models of empirical aggregate economic analysis is examined.

313 Intermediate Microeconomic Theory Fall, spring, or summer. 4 credits. Prerequisites: Economics 101–102 and calculus.

For description see Economics 311.

314 Intermediate Macroeconomic Theory Fall, spring, or summer. 4 credits. Prerequisites: Economics 101–102 and calculus.

For description see Economics 312.

315 History of Economic Thought Fall. 4 credits. Prerequisites: Economics 101–102 or permission of instructor.

Selected readings from the works of Adam Smith, T. Malthus, D. Ricardo, J. S. Mill, L. Walras, J. A. Schumpeter, A. Marshall, and J. M. Keynes.

317 Intermediate Mathematical Economics I Fall. 4 credits.

Introduction of calculus and matrix algebra; problems of maximization of a function of several variables. Economic examples are used to illustrate and teach the mathematical concepts.

318 Intermediate Mathematical Economics II Spring. 4 credits.

Advanced techniques of optimization and application to economic theory.

319 Introduction to Statistics and Probability Fall or summer. 4 credits. Prerequisites: Economics 101–102 and calculus (Mathematics 111 or equivalent).

This course provides an introduction to statistical inference and to principles of probability. It includes descriptive statistics, principles of probability, discrete and continuous distributions, and hypothesis testing (of sample means, proportions, variance). Regression analysis and correlation are introduced.

320 Introduction to Econometrics Spring. 4 credits. Prerequisites: Economics 101–102, 319, or equivalent, and calculus.

Introduction to the theory and application of econometric techniques. How econometric models are formulated, estimated, used to test hypotheses, and used to forecast; understanding economists' results in studies using regression model, multiple regression model, and introduction to simultaneous equation models.

323 American Economic History Fall. 4 credits. Problems in American economic history from the first settlements to early industrialization are surveyed.

324 American Economic History Spring. 4 credits. Prerequisites: Economics 101–102 or permission of instructor.

A survey of American economic history from the Civil War to World War I.

325 Economic History of Latin America Fall. 4 credits. Open to upperclassmen with some background in economics or history, or with permission of instructor.

326 History of American Enterprise Fall. 4 credits. Prerequisites: Economics 101–102 or equivalents.

History of the changing structure of American business from 1800 to the present, with major emphasis upon developments after the Civil War. The focus of the course will be the changing structure of challenges (for example, the rise of unions, development of a national capital market, changing role of government) and the various responses of business organizations and entrepreneurs to those challenges.

329 Eastern Europe Today: Economics, Government, Culture (also Government 326 and Russian 329) Spring. 4 credits. Economics majors cannot use this course to fulfill major requirements.

Introductory interdisciplinary survey of Poland, Hungary, Czechoslovakia, and Yugoslavia since World War II, with emphasis on contemporary development. The goals of the course are to examine differences (the variety of backgrounds) among East European countries, the common elements (for example, political relations with the USSR), domestic situations, the economy, and culture.

330 The Soviet Union: Politics, Economics, and Culture (also Government 330 and Russian 330) 4 credits. Economics majors cannot use this course to fulfill major requirements.

Introductory interdisciplinary survey of the USSR since the Revolution, with emphasis on contemporary developments.

331 Money and Credit Spring or summer. 4 credits. Prerequisites: Economics 101–102.

A systematic treatment of the determinants of the money supply and the volume of credit. Economic analysis of credit markets and financial institutions in the United States.

333 Theory and Practice of Asset Markets Fall or summer. 4 credits. Prerequisites: Economics 311 or 313, and 312 or 314.

The theory and decision making in the presence of uncertainty and the practical aspects of particular asset markets are examined.

335 Public Finance: The Microeconomics of Government Fall. 4 credits. Prerequisites: Economics 101–102, one semester of calculus, or permission of instructor.

The role of government in a free market economy is analyzed. Topics covered include public goods, market failures, allocation mechanisms, optimal taxation, effects of taxation, and benefit-cost analysis. Current topics of an applied nature will vary from term to term.

336 Public Finance: Resource Allocation and Fiscal Policy Spring. 4 credits. Prerequisites: Economics 101–102, one semester of calculus, or permission of instructor.

A continuation of Economics 335 covering macroeconomic and special topics. Subjects covered include the federal debt, the budget, and government regulation and transfers, as well as problems like local public goods, the hierarchy of governmental structure, plus a variety of applied problems.

338 Macroeconomic Policy Fall. 4 credits. Prerequisite: Economics 312 or 314.

The use of fiscal and monetary policies for achieving full employment, price-level stability, and appropriate economic growth are studied.
341 Labor Economics Fall. 4 credits. Prerequisites: Economics 101—102.

342 Problems in Labor Economics (also Industrial and Labor Relations 343) Fall. 4 credits. Prerequisites: Economics 311 or 313 or Industrial and Labor Relations 240. The theory and empirical analysis of labor markets and their applications to policy issues are considered in depth. Specific topics vary each semester. The course is designed to increase each student's competence in applying microeconomics, labor theory, and econometrics to policy issues through an econometric research project.

347 Economics of Evaluation 4 credits. An introduction to the methodologies used by economists to evaluate social and public programs and legislation. General evaluation methodology, cost-benefit analysis, and econometrics are discussed. Case studies are considered to illustrate the uses of these techniques, to acquaint the student with major current government programs and legislation, and to estimate these programs' economic impacts. Throughout, the primary analytic framework used by the instructor is microeconomics.

351 Industrial Organization Fall. 4 credits. Prerequisites: Economics 311 or 313 or permission of instructor. An examination of the ways in which markets in a modern industrial economy differ from the atomistically competitive model, the consequences of those deviations, and (if appropriate) the cures for them. The course covers the economic theories of monopoly and oligopoly, including issues involving mergers and vertical integration, and analyzes efforts of the United States, primarily through its antitrust laws, to deal with perceived shortcomings in the behavior of the American economy.

352 Advanced Topics in Industrial Organization Spring. 4 credits. Prerequisites: Economics 311 and 351 and some knowledge of calculus. This course examines some of the major issues raised in the industrial organization literature. Major topics include perfect competition, imperfect competition, OPEC, after World War II, and oligopoly, including issues involving mergers and vertical integration, and analyzes efforts of the United States, primarily through its antitrust laws, to deal with perceived shortcomings in the behavior of the American economy.

354 Economics of Regulation Spring. 4 credits. Prerequisites: Economics 313 or Civil and Environmental Engineering 321. Explores technological bases for government intervention in the private market economy, which include decreasing cost industries (natural monopolies) and technical externalities (pollution and risk). The economic implications of regulating electric, gas, and communications and transportation utilities, including pricing, service quality, efficiency incentives, and long-range planning issues, are examined in detail. Topics on environmental protection and societal risk management are also explored.

355 Politics and Markets Fall. 4 credits. Prerequisites: Economics 311 or 313, and 312 or 314, or equivalents. The course uses the tools of applied price theory to examine the tension between individual and collective goods in the modern welfare state. Topics covered include theories and policies related to income redistribution, regulation of the labor contract, paternalism, and the left's critique of capitalism.

357 Economics of Imperfect Information Spring. 4 credits. Prerequisites: Economics 101—102 and calculus. This course covers a variety of topics in the economics of uncertainty, including basic decision theory, search theory, risk insurance, and equilibrium price dispersion.

358 Current Economic Issues Fall. 3 or 4 credits. (A research paper will be required if the 4-credit option is chosen.) Prerequisites: Economics 101—102. The emphasis will be on the application of simple microeconomics and industrial organization concepts to the formulation of public policy in the present and recent past. Among the topics likely to be covered will be issues related to energy, communications, and transportation; the financing and delivery of medical care, public utility, and other kinds of regulation; and the economics of inflation.

361 International Trade Theory and Policy Fall. 4 credits. Prerequisites: Economics 101—102 or permission of instructor. The principles that have guided the formulation of international trade and commercial policy are surveyed. The evolution of the theory of international trade, principles and practices of commercial policy, problems of regional integration and customs unions, and institutions and practices of state trading are considered.

362 International Monetary Theory and Policy Spring or summer. 4 credits. Prerequisites: Economics 101—102 or permission of instructor. The principles that guided the formulation of international financial policies are surveyed. The evolution of the theory of balance of payments adjustment, international standards, international capital movements, economic aid, international monetary institutions, and proposals for international monetary reforms are considered.

366 The Economy of the Soviet Union Fall. 4 credits. Prerequisites: Economics 101—102. A survey of the Soviet economic system and Soviet economic development since 1917. Both institutional and theoretical aspects will be considered. Emphasis will be on current developments, including East-West economic and military competition, economic relations with the Eastern Bloc and with Western Europe, and foreign trade.

367 Comparative Economic Systems: Soviet Union and Europe Fall. 4 credits. Prerequisite: Economics 311—312 or permission of instructor. Discussion of approaches to comparison of economic systems. Consideration of abstract models (market economy, central planning, decentralized socialist market as well as planning systems) in the economies (France and Sweden, Yugoslavia, and Soviet Union). Possibility of convergence of economic systems is explored.

368 Comparative Economics: United States, Europe, and the Soviet Union Spring or summer. 4 credits. Prerequisites: Economics 101—102. Intended for students who are not majoring in economics. European and Soviet economics after the Second World War are surveyed. The European countries studied include France, Sweden, and Italy in the West, and Yugoslavia plus another country in the East. A descriptive and institutional approach is used and designed for nonmajors.

369 Selected Topics in Socialist Economics Fall. 4 credits. Prerequisites: Economics 101—102. Selected topics on the contemporary economic situation in the Soviet Union and Eastern European countries. Evolution of East-West economic relations. Special emphasis on Poland and the implications of its current crisis. The application of formal economic models to the analysis of these countries' economic problems (economic growth, business cycles, inflation, technology factor, etc.).

370 Issues in Poverty and Development Spring. 4 credits. The course will introduce current issues and controversies in the development economics. Questions to be discussed will include What are the obstacles to development according to the different schools of thought? Which countries have made significant progress in the last three decades and why? What are the policies that have been pursued, and how successful have they been? The required readings will be supplemented with outside speakers and film presentations.

371 Economic Development Fall. 4 credits. Prerequisites: Economics 311, 313, and 320 and calculus. Study of the problem of sustaining accelerated economic growth in less-developed countries. Trade-offs between growth, welfare, and equity; the legacy of colonialism; relevance of history and economic theory; problems of capital formation, economic planning and international specialization; and the interaction of industrialization, agricultural development, and population change are emphasized.

372 Applied Economic Development Spring. 4 credits. Prerequisites: Economics 311 or 313.

373 International Specialization and Economic Development Spring. 4 credits. Prerequisites: Economics 101—102 or permission of instructor. The assessment of the gains and risks and the appropriate role for specialization and trade in economic development; management of the external disequilibrium attending serious efforts to accelerate economic development; and the processes, institutions, and opportunities for innovation in transferring income from the relatively developed countries to those less developed.

374 National and International Food Economics (also Nutritional Sciences 457) Spring. 3 credits. Prerequisites: a college course in economics and junior standing or permission of instructor. Examination of individual components essential for an understanding of the United States and world food economies. Analysis of the world food economy. Review and analysis of (a) the major economic factors determining the demand for food, the composition of food consumption, and nutritional intake, and (b) the major economic factors affecting food production and supply. Examination and evaluation of the effectiveness of various food policies and programs in altering food consumption patterns. Principles of nutritional planning in developing countries within the context of the process of economic and social development.

378 Economics, Population, and Development Fall. 4 credits. The economic aspects of population and the interaction between population change and economic change are introduced. Particular attention is paid to economic views of fertility, migration, and integration, and to the impact of population growth on economic growth, development, modernization, resources, and the environment.

381 Economics of Participation and Workers' Management Fall. 4 credits. Prerequisites: Economics 311 or 313, and 312 or 314. After a historical survey of the ideas and practices of self-management and worker's cooperation, the main economic issues relating to the participatory firms and economies will be studied. Special attention will be given to the outcome of the decision-making process at the level of the enterprise. The relationship between these outcomes with national plans, and the policies used to implement them. Examples will be drawn from the Yugoslav experience and, depending on student interest, the discussion will cover other foreign experiences such as Algeria, the Basque region, Chile, West Germany, Israel, Peru, and others. A considerable emphasis will be given to the new developments and new possibilities of implementing democratic, worker-owned and worker-managed enterprises in the United States. Drawing on theoretical analysis developed in the course, appropriate institutions and legal forms of self-management in the United States will be examined.

382 The Practice and Implementation of Self-Management Spring. 4 credits. The various forms of labor participation in the world
today are described, and how producer cooperatives and labor-managed firms and systems can be created is explained. Extensive use is made of the theory of labor-managed systems. The history of various doctrines and self-managed experience is considered.

416 Intertemporal Economics Fall. 4 credits. Prerequisites: Economics 311 or 313 and calculus. This course is intended for advanced economics majors who are specially interested in economic theory. Topics to be covered: (a) Review of the one good Ramsey problem; (b) discounted capital accumulation; conditions for intertemporal efficiency in production; comparative dynamics and sensitivity analysis; (b) some earlier models of capital accumulation; the roles of present value and internal rate of return in guiding investment decisions; (c) growth, exhaustible resources; pollution and conservation: discussion of the trade-offs facing a society.

419 Economic Decisions under Uncertainty Fall. 4 credits. Prerequisites: Economics 319 and calculus. This course provides an introduction to the theory of decision making under uncertainty with emphasis on economic applications of the theory.

445 Topics in Microeconomic Analysis—Markets and Planning Fall. 4 credits. Prerequisites: Economics 311, 313, and one term of calculus. This is a course of economic theory designed for upperclass undergraduates. Course contents may vary from year to year. Issues that may be examined here include (1) how economic activities can be efficiently organized through the market mechanism; Why is the presence of many traders essential to efficiency? (2) What can be done if the indivisibility in production processes becomes an important hindrance to competitive pricing? (3) How can economic planning be decentralized efficiently? This course serves two purposes: (1) to introduce concepts that are novel to undergraduates and relevant to public policy but which are covered in courses in analytic tooling up, and (2) to illustrate the deductive approach of modern economic analysis — how to define concepts unambiguously, how to form propositions in clear-cut fashion, and how to follow up logical implications sequentially to the conclusion.

446 Topics in Macroeconomic Analysis—Is Keynesianism Dead? Spring. 4 credits. Prerequisites: Economics 312 or 314, and one term of calculus. The coverage of this course may vary from term to term. Presently the content of the course deals with the range of criticisms against Keynesian theory by the New Classical Economics, alias the Equilibrium School, alias the Rational Expectations School. Despite the fact that almost all intermediate macroeconomic textbook authors are Keynesian in perspective, clearly Keynesian economics is currently at bay. We shall review critically critiques to Keynesian theory.

473 Economics of Export-led Development Spring. 4 credits. Prerequisites: Economics 313 and 314. This course will examine the phenomenon of export-led development from both the theoretical and empirical points of view. Concentration will be on experiences within the West Pacific Rim.

481 Economic Effects of Participation and Labor-managed Systems Spring. 4 credits. Prerequisites: Economics 311 or 313, and 320, 381, and calculus. The course approach is economic theory to analyze the performance of firms in which employees either participate in the decision-making process or make all the important decisions. Numerous empirical studies are examined with particular emphasis on how economists actually model the relevant institutions and test the resulting theoretical predictions with appropriate econometric methods.

482 Practical Aspects of Business Management of Worker Enterprises Spring. 4 credits. Prerequisites: Economics 311 or 313, and 312 or 314. May be taken concurrently with or following Economics 382/582. This course is designed to further and deepen undergraduate and graduate students' knowledge of workers' self-management and cooperation, especially in view of actual formation of democratic enterprises. It will be based primarily on Freirean dialogue and participants' own presentations of their research in relevant areas such as cooperative business law, finance, accounting, or internal work organization. The instructor will act primarily as a coordinator and resource person, together with occasional invited speakers practically involved in the area of workers' management and cooperation. Students who have taken all three courses, Economics 382/582, 482, and 483, both graduate and undergraduate, are welcome to participate as teacher-student interns. They may receive additional independent study credits for this work.

483 The Technological and Product Base of Worker Enterprises, with Special Emphasis on Ecology and Solar Energy Applications Spring. 4 credits. Prerequisites: Economics 311 or 313, and 312 or 314. May be taken concurrently with or following Economics 382/582. This course is designed to further and deepen undergraduate and graduate students' knowledge of workers' self-management and cooperation, especially in view of actual formation of democratic enterprises. Students who have taken all three courses, Economics 382/582, 482, and 483, both graduate and undergraduate, are welcome to participate as teacher-student interns. They may receive additional independent study credits for this work. We will discuss the relationships between technology and choice of products on the one hand and socioeconomic systems on the other, especially the formation of democratic enterprises. Each student will be able to construct his or her own solar water pump using the Venek patents pending and work on several other related concrete projects. The students will also be invited to form worker cooperatives based on the experiences and results of Economics 382/582, 482, and 483.

Graduate Courses and Seminars

503 Nonparametric Methods for Peace Scientists and Regional Scientists Fall. 4 credits. Topics to be covered include advantages and disadvantages of parametric and nonparametric methods; problems involved in measurement; nonparametric methods based on one sample and many samples; nonparametric methods requiring only nominal measurement, and those requiring only ordinal measurement; nonparametric measures of association; procedures for nonnormal distributions.

504 Economics and the Law Fall. 4 credits. For description see Economics 304.

505 Interdependent Decision Making Fall. 4 credits. The basic elements in interdependent decision-making situations are examined. Situations where decision makers have different sets of objectives that they wish to achieve and employ different criteria for evaluating performance are focused on. The use of maximizing incremental procedures, game theory, and diverse methods of establishing priorities and cooperative action as well as reactive, interactive approaches to resolve conflict are considered. Coalition theory and related topics are covered.

509 Microeconomic Theory I Fall. 4 credits. Topics in consumer and producer theory.

510 Microeconomic Theory II Spring. 4 credits. Topics in consumer and producer theory, equilibrium models and their application, externalities and public goods, intertemporal choice, simple dynamic models and resource depletion, choice under uncertainty.

513 Macroeconomic Theory: Static Income Determination Fall. 4 credits.

514 Macroeconomic Theory: Dynamic Models, Growth, and Inflation Spring. 6 credits.

516 Applied Price Theory Fall. 4 credits. The course emphasizes the applications of the principles of price theory to a variety of problems taken from concrete, practical settings.

517 Intermediate Mathematical Economics I Fall. 4 credits.

518 Intermediate Mathematical Economics II Spring. 4 credits.

519 Econometrics I Fall. 4 credits. Prerequisites: Economics 319–320 or permission of instructor. This course gives the probabilistic and statistical background for meaningful application of econometric techniques. Topics to be covered are (1) probability theory; (2) probability spaces, random variables, distributions, moments, transformations, conditional distributions, distribution theory and the multivariate normal distribution, convergence concepts, laws of large numbers, central limit theorems, Monte Carlo simulation; (2) statistics: sample statistics, sufficiency, exponential families of distributions. Further topics in statistics will be considered in Economics 520.

520 Econometrics II Spring. 4 credits. Prerequisite: Economics 519. This course is a continuation of Economics 519 (Econometrics I) covering (1) statistics: estimation theory, least squares methods, method of maximum likelihood, generalized method of moments, theory of hypothesis testing, asymptotic test theory, and nonnested hypothesis testing and (2) econometrics: the general linear model, generalized least squares, specification tests, instrumental variables, dynamic regression models, linear simultaneous equation models, nonlinear models, and applications.

523 American Economic History Fall. 4 credits. For description see Economics 333.

524 American Economic History Spring. 4 credits. For description see Economics 324.

525 Economic History of Latin America Fall. 4 credits. For description see Economics 325.

535 Public Finance: Resource Allocation and Fiscal Policy Fall. 4 credits. For description see Economics 335.

536 Public Finance: Resource Allocation and Fiscal Policy Spring. 4 credits. For description see Economics 336.

551 Industrial Organization Fall. 4 credits. For description see Economics 351.

552 Public Regulation of Business Spring. 4 credits. For description see Economics 352.

554 Economics of Regulation 4 credits. For description see Economics 354.

555 Politics and Markets Fall. 4 credits. For description see Economics 355.
557 Economics of Imperfect Information Fall. 4 credits. Prerequisites: Economics 509 and statistics. The purpose of the course is to consider some major topics in the economics of uncertain information. Although the specific topics covered will vary from year to year, subjects such as markets with asymmetric information, signalling theory, sequential choice theory, and search theory will be discussed.

561 International Trade Theory and Policy Fall. 4 credits. For description see Economics 361.

562 International Monetary Theory and Policy Spring. 4 credits. For description see Economics 362.

565 Economic Problems of Latin America Spring. 4 credits.

567 Comparative Economic Systems: Soviet Union and Europe Fall. 4 credits. For description see Economics 367.

571 Economic Development Spring. 4 credits. For description see Economics 371.

572 Applied Economic Development Spring. 4 credits. For description see Economics 372.

573 International Specialization and Economic Development Spring. 4 credits. For description see Economics 373.

578 Economics, Population, and Development Fall. 4 credits. For description see Economics 378.

581 Economics of Participation and Worker Management Fall. 4 credits. For description see Economics 381.

582 The Practice and Implementation of Self-Management Fall. 4 credits. For description see Economics 382.

599 Readings in Economics Fall or spring. Variable credit. Independent study.

603 Seminar in Peace Science Fall. 4 credits. Among topics to be covered at an advanced level are game theory, coalition theory, bargaining and negotiation processes, cooperative procedures, microbehavior models, macrosocial processes, and general systems analysis.

605 Advanced Social Theory for Peace Scientists Spring. 4 credits. Prerequisites: Economics 505 and knowledge of microeconomic theory. Study of diverse social science hypotheses and theories as they relate to, and can be synthesized within, multiregional, multinational, and generally multigroup conflict and cooperative frameworks. Particular attention will be given to developments stemming from microeconomics and general systems theory. Dynamic analyses will be emphasized.

610 Stochastic Economics: Concepts and Techniques Spring. 4 credits. Prerequisites: Economics 509, 510, 513, 514, 519, and 520. This course will review a number of techniques that have been useful in developing stochastic models of economic behavior. Among these are (a) discrete-time Markov processes, (b) dynamic programming under uncertainty, and (c) continuous-time diffusion processes. Examples of economic models will be drawn from recent literature on optimal capital accumulation and optimal savings and portfolio selection problems; permanent income hypothesis; dynamic models of price adjustment, etc. Advanced graduate students contemplating work in economic theory and econometric theory will be able to get some exposure to current research.

611 Advanced Microeconomic Theory Fall. 4 credits.

612 Advanced Macroeconomic Theory Fall. 4 credits.

617 Mathematical Economics Fall. 4 credits.

618 Mathematical Economics Spring. 4 credits.

619 Advanced Topics in Econometrics I Fall. 4 credits. Prerequisites: Economics 519–520 or permission of instructor. Advanced topics in econometrics, such as asymptotic estimation and test theory, robust estimation, Bayesian inference, advanced topics in time-series analysis, errors in variable and latent variable models, qualitative and limited dependent variables, aggregation, panel data, and duration models.

620 Advanced Topics in Econometrics II Spring. 4 credits. Prerequisites: Economics 519–520 or permission of instructor. For description see Economics 619.

623 American Economic History Fall. 4 credits.

624 American Economic History Spring. 4 credits.

626 Methods in Economic History Spring. 4 credits.

631 Monetary Theory and Policy Fall. 4 credits.

632 Monetary Theory and Policy Spring. 4 credits.

635 Public Finance: Resource Allocation and Fiscal Policy Fall. 4 credits.

636 Public Finance: Resource Allocation and Fiscal Policy Spring. 4 credits.

637 Location Theory and Regional Analysis Fall. 4 credits. Prerequisites: Economics 509 and 517 and Econometrics. Economic principles influencing the location of economic activity, its spatial equilibrium structure, and dynamic forces. Topics include spatial pricing policies, price competition, and relocation by firms; residential location patterns; patterns of regional growth and decline; and patterns of urbanization.

638 Public Finance: Local Government and Urban Structure Fall. 4 credits. An integration of urban economics and location theory with local public goods and state and local public finance topics. Both equilibrium models and dynamic analyses are explored.

641 Seminar in Labor Economics Fall. 4 credits.

642 Seminar in Labor Economics Spring. 4 credits.

644 The Labor Market and Public Policy: A Comparative View Spring. 4 credits.

647 Economics of Evaluation (also Industrial and Labor Relations 647) Spring. 4 credits. For description see Industrial and Labor Relations 647.

648 Issues in Latin America Spring. 4 credits.

651 Industrial Organization and Regulation Fall. 4 credits.

652 Industrial Organization and Regulation Spring. 4 credits.

653 Public Policy issues for Industrial Organizations Spring. 4 credits. Prerequisites: Economics 509, 510, and 651. The course takes an in-depth view of the interaction between the government and business, Methods of business control, including antitrust, price regulation, entry regulation, and safety regulation. Emphasis will be not only on the economic effects on business, but on the economics of selecting and evoking the method of control.

661 International Economics: Pure Theory and Policy Fall. 4 credits.

662 Seminar in International Economics Spring. 4 credits. Prerequisites: Economics 661, acquaintance with conventional trade analysis, or permission of instructor. The course will cover advanced topics in international economics normally covered in International Economics 661.

664 International Economics: Balance of Payments and International Finance Spring. 4 credits.

670 Economic Demography and Development Fall. 4 credits.

671 Economics of Development Fall. 4 credits.

672 Economics of Development Fall. 4 credits. Prerequisites: Economics 509 and 520. The course is concerned with theoretical and applied works that seek to explain economic development, or lack thereof, in countries at low-income levels. Specific topics vary each semester.

674 Economic Systems Spring. 4 credits.

678 Economic Growth in Southeast Asia Spring. 4 credits.

679 Theory of Quantitative Economic Policy Spring. 4 credits.

681 Economics of Participation and Self-Management Fall. 4 credits. The theory of labor-management economies is developed systematically, and literature on that and related subjects is surveyed. Theories of the participatory firm, industry, and general equilibrium are covered together with a microeconomic theory and analysis of special dimensions of the system. Efficient decision-making processes within the firm are also studied. Illustrative references to Yugoslavia and other real instances of labor participation are made throughout.

682 Seminar on Economics of Participation and Labor-managed Systems Fall. 4 credits.

684 Seminars in Advanced Economics Fall and spring. 4 credits.

English

Visiting professors and postdoctoral fellows: D. Ackerman, A. F. Avi-Ram, M. McFee, P. West, S. Youn.

The Department of English offers a wide range of courses in English and American literature as well as in creative writing and expository prose. Literature courses focus variously on close reading of texts, on study of particular authors and genres, on the relationship of literary works to their historical periods, and on questions of critical theory and method. The department not only stresses the development of analytical reading and lucid writing but, through the study of major literary texts, teaches students to think about the nature and value of human experience.

Students who major in English develop their own programs of study in consultation with their advisers. Some focus on a particular historical period or major literary genre (poetry, drama, or the novel). Others pursue special interests in such areas as women’s literature or creative writing. Students may also concentrate in medieval studies or American studies.

The Major

Any student considering a major in English should see the department’s director of undergraduate studies to discuss the major and be assigned a major adviser. Copies of a brochure containing suggestions for English majors and prospective English majors are available in the department office, 252 Goldwin Smith Hall.

The Department of English requires students to prepare themselves for the major by taking at least one of the following prerequisite courses: The Reading of Fiction (English 270), The Reading of Poetry (English 271), Introduction to Drama (English 272), The American Language (English 276), or Creative Writing (either English 280 or 281). These courses focus on the skills basic to the English major and to much other academic work: responsive, sensitive reading and lucid English. English 270, 271, and 272, which may be used to satisfy the Freshman Seminar requirement, are open to all second-semester freshmen. First-term freshmen with a score of 700 or above given by such departments and programs as the Advanced Placement Examination in English may also fulfill these requirements by taking at least one of the above courses at an approved college or university.

Advanced Placement Examination in English may also enroll in English 270, 271, and 272 as space permits, and students interested in majoring in English are especially encouraged to do so.

English majors are required to complete six credits of foreign language study (preferably in literature) in courses for which qualification is a prerequisite. Advanced placement credit does not fulfill this requirement, nor does the study of foreign language in translation. Majors are urged to complete this requirement by the end of their sophomore year, and those who enter Cornell without sufficient preparation should begin their language study at once.

English 201 and 202, a survey of major British writers, though not required for the major, are strongly recommended for majors and prospective majors, since they afford an overview of the history of English literature. English 201 surveys Old English poetry, Chaucer, and the Middle Ages; English 202 surveys literature from Shakespeare, for instance, counts toward the pre-1800 requirement and toward concentrations in drama or in Renaissance literature. In fulfilling these requirements, students may count toward the English major a maximum of 12 credits in literature and creative writing courses at the 300 level or above given by such departments and programs as Comparative Literature, Theater Arts, foreign languages, the Africana Studies and Research Center, and the Society for the Humanities. In addition, double majors may count toward the English major courses taken in their other major if such courses are approved by their English department adviser as relevant to the study of literature.

Honors. Prospective candidates for the degree of Bachelor of Arts with honors in English should consult the English 201-202 Honors Committee during the spring term of their sophomore year or early in their junior year. Honors candidates will take one or two honors seminars (English 491 or 492) during their junior year, as well as an independent study in which they plan to work during their senior year. The work of the senior year is a yearlong tutorial (English 493 and 494) on a special topic of the candidate’s choosing, culminating in the writing of a scholarly honors thesis of approximately fifty pages, or a book-length work of high quality in creative writing completed for English 480-481. More information about the program may be found in the department’s brochure for honors candidates.

Courses for Nonmajors

For students not majoring in English, the department makes available a variety of courses at all levels. Some courses at the 200 level are open to qualified freshmen, and all of them are open to sophomores. Courses at the 300 level are open to juniors and seniors and to underclass students with permission of the instructor. The suitability of courses at the 400 and 600 levels for nonmajors will vary from topic to topic, and permission of the instructor is required.

Courses for Freshmen

As part of the Freshman Seminar Program, the Department of English offers many one-semester courses concerned with various forms of writing (narrative, biographical, expository), with the study of specific areas in English and American literature, and with the relation of literature to culture. Students may elect any two of these courses during their first year to satisfy the Freshman Seminar requirement. Descriptions of Freshman Seminar offerings may be found in the Freshman Seminar Program listings in the section “Special Programs and Interdisciplinary Studies.”

Courses for Sophomores

Although courses numbered in the 200s are primarily for nonmajors, some of them are open to qualified freshmen and to upperclass students. Courses approved for the major are English 201 and 202 and all courses numbered 300 or above except English 496. In addition to English 201—202, students may count up to two 200-level courses toward the major from “Courses Approved for the Major,” listed below.

201—202 The English Literary Tradition

201, fall; 202, spring. 4 credits each term. Open to all undergraduates. English 201 is not a prerequisite to 202.

Courses Primarily for Nonmajors

205—206 Readings in English and American Literature

205, fall; 206, spring. 3 credits each term. Open to all undergraduates. English 205 is not a prerequisite to 206.

Courses for Majors

205, 206 The English Literary Tradition

205, fall; 206, spring. 3 credits each term. Open to all undergraduates. English 205 is not a prerequisite to 206.

W F 11:15. Fall: W. Wetherbee, spring: M. Abrams, P. Sawyer.

Interpretation of major works ranging from Beowulf through Yeats. English 201 surveys Old English poetry, Chaucer, medieval romances, Spenser, Shakespeare, Donne, and Milton. English 202 covers Swift, Pope, Samuel Johnson, Blake, Jane Austen, the major Romantic and Victorian poets, and Yeats. The course will be conducted by a combination of lectures and intensive seminars in special topics.

Courses for Majors

205—206 Readings in English and American Literature

205, fall; 206, spring. 3 credits each term. Open to all undergraduates. English 205 is not a prerequisite to 206.


205: An introduction to the works of major figures from the beginning through the eighteenth century. The first week will be devoted to reading from Chaucer’s The Canterbury Tales, as samples of early yet readily understandable literature. Readings from other authors include Shakespeare, Jonson, Marlowe, Donne, Pope, Swift, and Johnson. 206: Covers literature since the mid-nineteenth century. Novels by such authors as Emily Bronte, Conrad, Hardy, Hemingway, Faulkner, Ellison, Vonnegut, and others; poems by Browning, Hardy, Eliot, and Frost; plays by Shakespeare, Swift, Pope, Samuel Johnson, Blake, Jane Austen, the major Romantic and Victorian poets, and Yeats. The course will be conducted by a combination of lectures and intensive seminars in special topics.

208 Forms of Poetry

Spring. 3 credits.


This is an introductory course for which no previous literary training is assumed. The aim of the course is to develop the students’ skills in reading and talking about poetry through the close study of a wide range of short poems. Inquirers into the implications of Wallace Stevens’s claim that “All poetry is experimental poetry,” will explore how poets make rules for themselves in order to break them and create poetic traditions by transgressing against traditional forms. Not a historical survey, Forms of Poetry surveys various forms and styles of poetry and the poetic devices and formal patterns they share. From time to time throughout the course, questions of poetic form will be studied through dialogues from painting, architecture, and popular culture. Poets to be read include Shakespeare, Herbert, Pope, Blake, Keats, Poe, Whitman, Dickinson, Frost, Williams, Bishop, Merwin, and Ammons. Requirements: two brief (two to three pages) papers, an in-class midterm examination, and a final examination.

210 Medieval Romance: The Voyage to the Otherworld

Fall. 3 credits.

W M F 11:15. C. Kaske.

The course will survey some representative medieval narratives concerned with voyages to the otherworld or with the impinging of the otherworld upon ordinary experience. The syllabus will normally include some
representative Old Irish otherworld literature; selections from the Mabinogion; selections from the Lais of Marie de France; Chaucer's The Nun's Priest's Tale, The Tale of a Pilgrim, and The Owl and Lancelot; and the Middle English Sir Orifro and Sir Gawain and the Green Knight. We will finish by looking at a few later otherworld romances, such as selections from Spenser’s The Faerie Queen, Neat’s La Belle Dame sans Mercie, and Tolkien’s The Hobbit. All readings will be in modern English. Requirements: three brief (two to three typed pages) papers and a final exam designed to test the students’ reading.

227 Shakespeare Fall or spring. 3 credits. Each section limited to 25 students. Prerequisite: completion of, or current enrollment in, another course in the humanities or expressive arts. S/U grades with permission of instructor.

The course helps students strengthen reading and writing skills valuable in all disciplines and particularly appropriate to the humanities. It also encourages them to ask what they are doing when they read, interpret, and move about works of literature, philosophy, religious scripture, and the visual arts. Using such materials, the course takes up problems of technique in writing (audience, topic choice, organization, critical method, use of secondary materials) and explores some of the larger questions to which they point: How does good critical and interpretative writing shape as well as find its audience? How does commentary change as we move from literature to philosophy, religious writing, art, and film? What counts as knowledge in these domains, and how is it formed by the media of its expression? What relevance to our study have historical data and theoretical speculation? Students in the course write (and often revise) roughly thirty pages (eight to ten papers) and confer often with the instructor.

Fall: M W F 11:15 or T R 10:10. S. Davis. Spring: hours to be arranged.

Writing done in the humanities makes a strong claim to understanding its material while commenting on it. The course begins with short works that provoke commentary by challenging our understanding and moves on to consider works that pit literary, philosophical, or historical understanding against its supposed competitors: the humanities, art, inspiration, madness, the divine, and the will to power. Readings/views include Leonardo's Mona Lisa; Manet’s Olympia; parables by Borges, Kafka, St. Matthew, and J. M. Coetzee; Mann’s Death in Venice; Plato’s Gorgias; Nietzsche’s Birth of Tragedy: Euripides’ The Bacchae; and Peter Weiss’s Marat/Sade, the film and the play.

Fall: M W F 12:20. S. Goodhart. Spring: hours to be arranged.

A list of primary works will include Kafka’s Metamorphosis, selections from Plato’s Republic, Euripides’ The Bacchae, Nietzsche’s The Birth of Tragedy: paintings by Velasquez and Magritte (with Foucault’s commentary on each), the biblical story of the binding of Issac, and Kurosawa’s film RASHOMON. An introduction to some forms of modern biography, traditional and experimental, to see how writers have represented and illuminated character and achievement. Subjects usually range from Leonardo da Vinci and Martin Luther to George Washington and F. Scott Fitzgerald; writers from Freud and Erikson to Lynton Strachey, Virginia Woolf, and Nancy Milford. Consideration of the values of biography, biographical “truth,” the relation of biography to history, psychology, ethics, the novel, and autobiography.


247 Major Nineteenth-Century Women Novelists (also Women’s Studies 248) Fall. 4 credits.

M W F 1:25. J. Blackall.

This course gives particular attention to the biographical and social circumstances surrounding the novels, their critical reception within their own time, and the themes and subject matter that women novelists elected to write about. The reading includes masterworks and certain other works that exerted a major imaginative impact on contemporary readers. Readings are Austen, Persuasion; C. Bronte, Jane Eyre; E. Bronte, Wuthering Heights; Gaskell, Mary Barton; Stowe, Uncle Tom’s Cabin; Eliot, The Mill on the Floss; Gilman, The Yellow Wallpaper; and Chopin, The Awakening. In addition, two twentieth-century works, Jean Rhys’s Wide Sargasso Sea and Edith Wharton’s Ethan Frome, will be approached as imaginative sequels to Jane Eyre and Wuthering Heights, respectively.

251 Twentieth-Century Women Novelists (also Women’s Studies 251) Spring. 4 credits.

M W F 9:05. S. Samuels.

This course will examine questions raised by literature by and about women in twentieth-century narrative fiction, particularly questions about women’s experience, perspective, and language. We will read works by Virginia Woolf, Gertrude Stein, Toni Morrison, Alice Walker, Zora Neale Hurston, and others.

253 The Modern Novel Fall. 4 credits.

A survey of the modern novel with some attention to its social and cultural context. We will read and discuss a selection of the most influential novels written in Europe and America during the first half of this century. Authors include Woolf, Joyce, Mann, Hurston, Gide, and Eliot.


273 Irish Culture Fall. 4 credits.


An interdisciplinary survey of Irish culture from earliest times to the present. Topics include medieval literature and mythology, early Irish social life, land and agriculture, the Irish language, the visual arts, the decline of the Gaelic order, and the corresponding rise of the Anglo-Irish ascendancy. The modern literary revival will receive particular attention, and major works of the 19th century and the present will be studied in relation to historical and political developments from the Young Ireland movement of the 1840s to the Revolution and Civil War of 1899–’23. The course will conclude with a consideration of post-Revolutionary literature and of the continuing Ulster crisis. No prerequisites.

277 Folklore and Literature Fall. 4 credits. Not offered 1986–87.

Courses that Satisfy the Major Prerequisite

270 The Reading of Fiction (also Comparative Literature 270) Fall or spring. 3 credits. Each section limited to 17 students. Recommended for prospective majors in English. Fall: open to freshmen who have received advanced placement in English. Spring: open to other qualified freshmen. Upperclass students admitted as space permits. May be used to satisfy either the freshman seminar requirement or the distribution requirement in the humanities, but not both.

Fall: M W F 11:30, D. Fried; T R 10:10, E. Fogel; T R 2:30, C. Chase. Spring: hours to be arranged.

Designed to sharpen the student’s ability to understand and respond to poetry. Readings in the major periods, modes, and genres of poetry written in English.

272 Introduction to Drama Fall or spring. 3 credits. Each section limited to 17 students. Recommended for prospective majors in English. Fall: open to freshmen who have received advanced placement in English. Spring: open to other qualified freshmen. Upperclass students admitted as space permits. May be used to satisfy either the freshman seminar requirement or the distribution requirement in the humanities, but not both.

Fall: M W F 11:30, D. Fried; T R 10:10, E. Fogel; T R 2:30, C. Chase. Spring: hours to be arranged.

Selected masterworks by such playwrights as Sophocles, Ibsen, and Shaw introduce the chief idioms and styles of Western dramatic tradition. The course work will consist of discussions and papers as well as a special project related to a play being produced by the Department of Theatre Arts. The course will be taught in small sections.

275 The American Literary Tradition Fall or spring. 3 credits. Recommended for prospective majors in American studies.


The problem of an American national literature is explored through the reading, discussion, and close analysis of texts representing the four principal periods in American literary history. Not a survey, this course focuses on the relations of the texts to each other, the role of Americanism in those relationships, and the assumptions about history and language with which critical appreciation must engage. Works by such writers as Franklin, Hawthorne, Twain, Stephen Crane, Wharton, James and Fitzgerald.

280-281 Creative Writing 280, fall; 281, spring. 3 credits each term. Each section limited to 18 students. Recommended for prospective majors in English. Prerequisite for English 281: recommendation from English 280 instructor.

Hours to be arranged. Fall: L. Herrin and staff. Spring: S. Vaught and staff.

An introductory course in the theory and practice of writing narrative prose, poetry, and allied forms.
Courses for Sophomores, Juniors, and Seniors

Courses at the 300 level are open to juniors and seniors and to others with the permission of the instructor. There are no specific prerequisites except as noted for English 382–383 and 384–385.

302 Literature and Theory (also Comparative Literature 360) Fall. 4 credits.
M W F 10:00 (2 lecs, 1 disc). J. Culier.
This introduction to contemporary literary theory will investigate assumptions behind current approaches to literature while situating a recent writing in what is called "theory." In addition to discussing competing views of the nature of literature and of critical method, we will consider the impact on literary study of such theoretical movements as structuralism, deconstruction, Marxism, and feminism and the relations between literary study and other disciplines such as anthropology, linguistics, philosophy, historiography, and psychoanalysis. Lectures will attempt to elucidate difficult theoretical texts by such authors as Barthes, Derrida, De Man, and Seniors and Barbara Johnson. There will be a midterm, a paper, and a final examination.

313 Middle English Literature in Translation
Spring. 4 credits.
Readings from Middle English literature in translation, excluding Chaucer. Though texts vary, a typical selection would be Arthurian romances such as Lancelot’s Brut, the Alliterative Morte Arthure, Sir Gawain and the Green Knight, and Malory’s Morte d’Arthur; Middle English lyrics and plays; and major poems such as Piers Plowman, The Pearl, the other works of the Gawain-poet, Gower’s Confessio Amantis, The Owl and the Nightingale, and The Land of Cockayne.

319 Chaucer
Spring. 4 credits.
The course will center on a close reading of the major Canterbury Tales, Troilus and Criseyde, and some of the minor works. Students will be given ample opportunity to learn Chaucer’s language, so that all dimensions of the poems will be available to them. Prior knowledge of Middle English is neither expected nor required; course participants will be encouraged to follow up their own interests in class reports and papers.

320 The Sixteenth Century: Tudor Culture
Fall. 4 credits. Offered alternate years.
M W F 1:25. C. Levy.
The development of English as an imaginative and persuasive medium, from Wyatt and Ascham through Sidney, Spenser, Marlowe, Shakespeare (the non-dramatic verse), and Hooker. Consideration in particular of lyric verse, pastoral, epic, and epyllion; prose stylistics and rhetorical doctrine; and such early prose fiction as that of Greene, Lodge, and Nashe. Some attention to Elizabethan drama other than Shakespearean and a brief excursion into late Elizabethan court culture.

321 Spenser and Malory

322 The Seventeenth Century
4 credits. Offered alternate years.

327 Shakespeare
Fall. 4 credits.
M W F 9:05. T. Brooks.
An introduction to the works of Shakespeare, based on a selection of plays representative of the stages of his artistic development and the range of his achievement.

329 Milton
Spring. 4 credits.
M W F 9:05. G. Teskey.
An introduction to the poetry of John Milton.

330 Restoration and Eighteenth-Century Literature
Spring. 4 credits.
M W F 2:30. N. Saccamano.
A course in the history of English literature from 1660 to 1790, concentrating on generic development and on the relations between literature and society. Major themes will include the rise of the novel, the nature of satire, the literary characteristics of sentimentalism, the rise of "preromantic" poetry, and the interactions among all these themes. Works by Wycherley, Dryden, Rochester, Swift, Pope, Defoe, Richardson, Fielding, Johnson, Sterne, and Gray.

333 The Eighteenth-Century English Novel
Fall. 4 credits.
The rise of the English novel. We will place the emergence of the novel as a dominant literary genre in the context of other intellectual and cultural developments in eighteenth-century England and will discuss what the novel's changing form can tell us about the nature of fiction and the problems of representation. Novels by Defoe, Richardson, Fielding, Smollett, Sterne, MacKenzee, and Burney.

340 The English Romantic Period
Fall. 4 credits.
M W F 11:15. R. Parnavela.
Readings in verse and prose by major writers, including Blake, Burke, Coleridge, Wordsworth, Byron, Shelley, Keats, and some other related letters and critical writings of the period. Emphasis will be on the French Revolution, narrative and lyric representation, literary influence and originality, and theories of the imagination.

345 The Victorian Period

348 The Female Literary Tradition:
Wollstonecraft to Woolf (also Women's Studies 348)

350 The Early Twentieth Century (to 1920)
Fall. 4 credits.
Critical study of major works by Hardy, Conrad, Lawrence, Joyce, Room, Eliot, Yeats, Hopkins, Wilde, and others. While the emphasis will be upon individual works, some attempt will be made to place the authors and works within the context of literary and intellectual history. The course will seek to define the development of literary modernism in England by reference to these authors' innovations in themes and techniques. These literary works will be examined as part of a transition in British culture that takes place between 1890 and 1920.

351 Modern Literature since 1914
Spring. 4 credits.
A survey of modern English, Anglo-Irish, and Anglo-Welsh fiction, poetry, and drama by Shaw, Lawrence, Joyce, Forster, Woolf, Waugh, Yeats, Eliot, O’Casey, Auden, Beckett, Pinter, and others. The course will be conducted by a combination of lectures and intensive seminars in special topics. Although the emphasis will be upon individual works, the wider context of literary, intellectual, and social history will also be considered. Complementing the text, film versions of certain novels will be shown.

353 Postcolonial Literatures
Fall. 4 credits.
Topic for 1986: fictions of India. In what different ways has the Indian subcontinent been represented in literary and cultural texts in this century? What are the traces, as in Prah, Gayatri’s texts—from E. M. Forster’s A Passage to India to Salman Rushdie’s Midnight’s Children, from Kipling’s popular fiction to V. S. Naipaul’s critical essays, or even from David Lean’s film adaptation of Forster to such popular television serials as The Jewel in the Crown—tell us not only about "India" but, more generally, about the political significance of cultural representation? Focusing on such examples and questions, this course examines the historical construction of race, gender, and "cultural others" in the period. Additional readings in the literature of ideas produced by America’s Puritan and Enlightenment writers: Bradford, Taylor, Edwards, Woolman, Franklin, and Paine. The first achievements of the national literature: Brown, Bryant, Irving, and Poe.

362 The American Renaissance
Spring or summer. 4 credits.
The major literary achievements of Emerson, Thoreau, Hawthorne, Melville, Whitman, and Dickinson—read in themselves and in relation to one another.

363 The Age of Realism and Naturalism
Fall. 4 credits.
T R 10:00. M. Seltzer.
The literary expression of new attitudes toward American society and culture between the Civil War and the early years of the twentieth century. We will read representative works by writers such as Mark Twain, W. D. Howells, Henry James, Edith Wharton, Stephen Crane, Kate Chopin, and Theodore Dreiser.

364 American Literature between the Wars

365 American Literature since 1945
Spring. 4 credits. Limited to 55 students.
M W F 1:25. L. Herrin.
This course will alternate with English 364, which surveys American literature between the two world wars. Most of the writers we will study will still live and write and change. Consequently, the verdict will not be in. Fiction writers will most likely include Bellow, Salinger, Barth, Ellison, Wright Morris, John Hawkes, Susan Sontag, and Donal Barthelemy. From an anthology of contemporary American poetry we will read Robert Lowell, A. R. Ammons, Sylvia Plath, Gary Snyder, Theodore Roethke, and others. If we have time we will look at the personally engaged journalism of Norman Mailer and Joan Didion. Writers will be chosen who will give us as keen and varied and provocative a view of ourselves as possible.

366 The Earlier American Novel: Nathaniel Hawthorne to Henry James

367 The Modern American Novel (through World War II)
Fall. 4 credits.
A reading of some major American novels of the first half of the twentieth century. Works by Wharton, Dreiser, Hemingway, Fitzgerald, Faulkner, Wright, and others. Lectures with some opportunity for discussion. Emphasis will be on the individual works, but some larger patterns will be viewed.

368 The Contemporary American Novel

370 The Nineteenth-Century English Novel
Spring. 4 credits.
A study of representative works by major English novelists from Austen to Hardy. The course will view these works from a number of different perspectives,
A close focus on five masterworks of the nineteenth century—Austen's Pride and Prejudice and Emma, Gaskell's Life of Charlotte Brontë and Wives and Daughters, and Eliot's Middlemarch—with particular regard for the circumstances, biographical and social, from which these works emerged. We will examine these writers' conception of the institution of marriage, their delineation of the problem of attaining self-sufficiency and self-expression within a domestic and rural community, especially for women; and their concepts of a "heroine" and a "hero." Emphasis will be on reading and discussion. Participants will keep journals reflecting their personal responses to the books and their pursuit of chosen topics, the notes leading to one final essay of moderate length.


[450] The History of the Book 4 credits. Limited to 20 students. Prerequisite: permission of instructor. T 7–9 p.m. D. Eddy.

A study of the physical aspect of books printed during the last six centuries. Included are papermaking, typography and printing, bookbinding, and the history of book illustrations; the transmission of manuscripts and bibliographical descriptions of hand-printed and modern trade books. Above all, this is the study of the book as a work of art.
454 Theater and Society (also Theatre Arts 434)  Spring. 4 credits. Prerequisite: some theater history or dramatic literature work at the 300 level or permission of instructor. Not offered 1986–87. M. Hays.)


The course will study the nature of American avant-garde theater, from the mid-sixties to the present. What are the aesthetics, aims, and social attitudes of the avant-garde? How does the avant-garde differ from more traditional American drama? How are the claims of the avant-garde related to the concerns of contemporary political theatre, ethnic theatre, and feminism? The course will also consider the world of performance art and theory. Readings will include texts by Shepard, Rabe, Marernet, Guere, Baraka, Miller, Ward, Wilson, Anderson, Durang. Ideally, we can also arrange a study weekend to see theater in New York City.


458 Masterworks of Modernism (also English 658)  Fall. 4 credits.


Vision and form in major texts from the period between the world wars. An exploration of the search for values in a troubled era and of concomitant formal experiments. The texts will include Lawrence, Women in Love, Joyce, Ulysses (selections); Pound, Hugh Selwyn Mauberley, the Cantos; Eliot, The Waste Land, Four Quartets; Woolf, Mrs. Dalloway, To the Lighthouse; Hemingway, The Sun Also Rises; and Yeats, The Tower, Last Poems.


463 The Political Novel in America  Fall. 4 credits. Limited to 15 students.

T R 1:30–1:45. C. Stratton.

A study of ideas, historical contexts, and methods of politically oriented novels by important writers from after the Civil War to the present. Such figures as Adams, M. C. Johnson, Dos Passos, Hemingway, Wright, Ellison, Cozzenz, and A. Walker will be studied. Previous work in American literature, history, or government recommended.


465 Frost, Eliot, and Stevens  Spring. 4 credits.


There are by common consent five names especially associated with American poetry between the wars: Frost, Williams, Pound, Eliot, and Stevens. In the course of one term it should be possible to read the principle work of at least three of these: the poetry to start with, followed by biography, and fiction. The last eight weeks will be spent on Ulysses. An effort will be made to show how the innovations that each author brings to the novel form derive from the demands of his characteristic themes. Some attention will be paid to theories of reading fiction. There is no final examination.

470 Studies in the Novel  Spring. 4 credits. Limited to 15 students. Prerequisite: permission of instructor.


A critical study of the major fiction of Conrad and Joyce. The last eight weeks will be spent on Ulysses. An effort will be made to show how the innovations that each author brings to the novel form derive from the demands of his characteristic themes. Some attention will be paid to theories of reading fiction. There is no final examination.


475 Telling Lives  Spring. 4 credits. Limited to 20 juniors and seniors. Prerequisite: permission of instructor. A Common Learning course.


A Common Learning course on the problem of narrative understanding and explanation in history, psychological biography, and fiction. In recent years, philosophers, historians, psychologists, and literary critics have debated the nature and status of storytelling as a forum of explanation that is central in the humanities. Controversy focuses on two issues: (1) the literary imagination at work in storytelling by historians, biographers, and psychoanalytic therapists and (2) the referential aspect of fictional stories. At one extreme, currently fashionable, everything becomes rhetoric without a referent; at another, older, extreme, only scientific laws are held to be truly explanatory. This course aims to seek more-useful and tenable ground for humanistic studies by exploring the territory defined by those who dispute this skepticism and dogmatism. Readings will be by philosophers, historians, biographers, analysts, literary critics, and moralists who have a bearing on these issues. Fellow teachers will be drawn from these areas as well.


477 Children's Literature  Fall or summer. 4 credits.

T R 2:30. A. Lorrie.

A survey of classic English and American works for children. Readings will include Lawrence, Women in Love, Joyce, Ulysses (selections); Pound, Hugh Selwyn Mauberley, the Cantos; Eliot, The Waste Land, Four Quartets; Woolf, Mrs. Dalloway, To the Lighthouse; Hemingway, The Sun Also Rises; and Yeats, The Tower, Last Poems.

480–481 Seminar in Writing  480, fall; 481, spring. 4 credits. Limited to 15 students. Students are encouraged to write a short and one long paper. Prerequisite: permission of instructor, normally on the basis of a manuscript. Not offered spring 1986–87.

1. Writing about Literature  Spring. 4 credits.


A Common Learning course on the problem of narrative understanding and explanation in history, psychological biography, and fiction. In recent years, philosophers, historians, psychologists, and literary critics have debated the nature and status of storytelling as a forum of explanation that is central in the humanities. Controversy focuses on two issues: (1) the literary imagination at work in storytelling by historians, biographers, and psychoanalytic therapists and (2) the referential aspect of fictional stories. At one extreme, currently fashionable, everything becomes rhetoric without a referent; at another, older, extreme, only scientific laws are held to be truly explanatory. This course aims to seek more-useful and tenable ground for humanistic studies by exploring the territory defined by those who dispute this skepticism and dogmatism. Readings will be by philosophers, historians, biographers, analysts, literary critics, and moralists who have a bearing on these issues. Fellow teachers will be drawn from these areas as well.

487 American Visions and Revisions  Spring. 4 credits.

T R 2:30. C. Stratton.

This seminar explores several close encounters of mind with mind between writers whose work—whether fictional, political, philosophical, or religious—responds to that of a predecessor and by so doing defines an important American theme and revises it in a new context. Examples involve three issues: the individualism (Emerson, Whitman; H. James, E. Wharton; W. James, D. Riesman); racial equality (Twain, Faulkner), and political religion (Jefferson, Lincoln, Neburth, King).


491 Honors Seminar I  Fall. Prerequisite: admission to the honors program and permission of instructor.


We will read together a good number of the poems of Donne, Jonson, and Marvell. We will read independently, in support of the poetry, some of the prose (in the case of Jonson, the prose or drama) of at least one of them chosen individually by members of the class. We will examine the critical discriminations of those poems made by commentators from Gerson to the modern day, "observing" the modern critical and cultural purposes each has been invoked to serve. We will seek to make clear some of the implications of past criticism, and we will seek to understand our own critical moment.


The four novelists are Dickens, Flaubert, Hardy, and Mann, and the question, as always, is how best to read a handful of texts—in this instance, some eight novels generated between the 1830s and 1950s. Besides, why ought we to read them? Specifically, some of the problems we need to take for an airing have to do with shifting character-definitions, the shifting conceptions of comic and tragic norms in the modern novel, and pressing sociopolitical substances (repressive and domineering, new class alignments, critical historical fall-outs: 1848, the rise of fascism, World War II). Texts: Oliver Twist and Bleak House, Madame Bovary and Sentimental Education; Late Hardy, and "Marx and the Magicians." Doctor Faustus, and Felix Krull. One short and one long paper.

492 Honors Seminar II  Prerequisite: admission to the honors program and permission of instructor.


"A poem, even though it is composed in the language of information, is not used in the language-game of giving information" (Wittgenstein). What happens to words used in ordinary speech (you, this, green), everyday verbal patterns (repetition, conversation, quotation), and other linguistic events (prayers, letters, lists) when they enter the charged context of a poem? We will seek to discover by what techniques, resource, and conventional means poetry derives its expressive power while it uses the wordaday medium of words and sentences. How does poetry refer to the world of the social, of history, and of "information" while playing its own "language game"? With a view to the senior honors thesis, we will seek to investigate the language of critical writings about poetry in the light of poetic language. Readings chiefly from nineteenth- and twentieth-century English and American poets such as Blake, Wordsworth, Dickinson, Whitman, Hardy, Frost, Moore, Williams, and Ammons.


Study and discussion of novels by Faulkner and Patrick White. While, a Nobel Prize winner, is an Australian writer whom many are coming to recognize as one of the major voices of this century. One purpose of the
course is to introduce more readers to White. Another is to view the two voices and visions in relation to one another.

493 Honors Essay Tutorial I Fall or spring. 4 credits. Prerequisite: senior standing and permission of the chairperson of the honors committee. Staff.

494 Honors Essay Tutorial II Fall or spring. 4 credits. Prerequisite: English 493 and permission of the chairperson of the honors committee. Staff.

495 Independent Study Fall or spring. 2–4 credits. Independent study is arranged between students and individual faculty members. A plan of study should be filed with the director of undergraduate study. Independent study should be undertaken only in areas in which the department does not have regular course offerings. Courses Primarily for Graduate Students

Permission of the instructor is a prerequisite for admission to courses numbered in the 600s. These are primarily intended for graduate students, although qualified undergraduates are not excluded. Undergraduates seeking admission to a 600-level course should consult the appropriate instructor. The list of courses given below is illustrative only; a definitive list, together with course descriptions and class meeting times, will be published in a separate department brochure before course enrollment each term.

611 Readings in Old English Fall. 4 credits. R. Farrell.

612 Beowulf Spring. 4 credits. R. Farrell.

613 Middle English Literature Fall. 4 credits. R. Kaske.

614 Middle English: II Spring. 4 credits. R. Kaske.

619 Chaucer Fall. 4 credits. W. Wetherbee.

621 Spenser Spring. 4 credits. C. Kaske.

623 The Metaphysical Poets Fall. 4 credits. D. Novarr.

627 Shakespeare Spring. 4 credits. S. McMillin.

629 Milton Fall. 4 credits. M. Radowicz.

630 Language, Knowledge, and Human Nature in the Eighteenth Century (also Comparative Literature 630) Spring. 4 credits. J. Culler.

641 Reading Romantic Narratives Fall. 4 credits. R. Parker.


645 Victorian Poetry Fall. 4 credits. P. Sawyer.

657 Twentieth-century Feminist Narrative Spring. 4 credits. M. Hite.

458/658 Masterworks of Modernism Fall. 4 credits. P. Marcus.

663 The Culture of Realism: Bodies and Machines Fall. 4 credits. M. Seltzer.

664 Recent American Poetry Fall. 4 credits. A. Ammons.

665 Hawthorne and James Spring. 4 credits. D. McCail.

666 Stevens, Moore, and Crane Spring. 4 credits. S. Siegel.

667 Topics in American Poetry Fall. 4 credits. D. Fried.

670 Realism Spring. 4 credits. H. Shaw.

675 Close Readings for Writers: Fiction Spring. 4 credits. J. McConkey.

682 Black Women and Their Fiction (also Comparative Literature 682) Fall. 4 credits. H. Gates.

693 Modernism and Marxist Theory Spring. 4 credits. S. Mohanty.

702 Introduction to Theory and Criticism Fall. 2–4 credits. J. Culler.


757 Ulysses Fall. 4 credits. D. Schwarz.

762 Melville Spring. 4 credits. M. Colacurcio.

780.1 M.F.A. Seminar: Poetry Fall. 5 credits. P. Janowitz.

780.2 M.F.A. Seminar: Fiction Fall. 5 credits. D. McCall.

781.1 M.F.A. Seminar: Poetry Spring. 5 credits. A. Ammons.

781.2 M.F.A. Seminar: Fiction Spring. 5 credits. W. Stoloff.

Related Courses in Other Departments

In addition to courses offered by the Department of Comparative Literature, the Women’s Studies Program, and the Africana Studies and Research Center, the following courses will be of particular interest to English majors and graduate students in English.

Comparative Literature

Great Books (Comparative Literature 201–202)

Medieval Literature (Comparative Literature 343)

The European Novel (Comparative Literature 363–364)

Poetry of the Late Eighteenth and Nineteenth Century (Comparative Literature 370)

Poetry, Language, Politics (Comparative Literature 430)

The Prose Poem (Comparative Literature 471)

French

See Modern Languages, Literatures, and Linguistics.

Freshman Seminar Program

See pp. 222–228.

Geological Sciences


As an intercollege unit, the Department of Geological Sciences has degree programs in both the College of Arts and Sciences and the College of Engineering.

Within the past few years, studies of the earth have become increasingly important. The need for increased understanding of plate tectonics, limited energy and mineral reserves, awareness of natural hazards such as earthquakes and volcanic eruptions, and an increasing concern for our environment encourage studies of the earth by geologists. Consequently, interest in geology courses and the employment of geologists have greatly increased. There are sixteen faculty members, including Cornell's president, in the department, and forty undergraduate majors. A variety of courses provides our students with a broad and solid foundation. The department is particularly strong in geophysics, petrology and geochemistry, structural geology, and tectonics. Students study the deeper parts of the earth's crust using many techniques but concentrating on seismic methods. High-pressure, high-temperature mineralogy research uses the diamond anvil and Cornell's synchrotron as research tools. Undergraduates have served as field assistants for faculty and graduate students who work in Greenland, British Columbia, the Aleutian Islands, Scotland, Barbados, the South Pacific, South America, and various parts of the continental United States. Undergraduates are encouraged to participate in research activities, sometimes as paid assistants. Students who major in geological sciences are encouraged to take courses appropriate to their interests in the other sciences and mathematics. In order to develop skills in observing the natural earth, geology majors attend a six-week summer field camp, usually during the summer following their junior year. Cornell has recently established a joint summer field camp with Harvard and Yale in the Sierra Madre of Wyoming.

The Major

The prerequisites for admission to a major in geological sciences in the College of Arts and Sciences are two two-semester sequences, Mathematics 191–192 and Physics 112–113, or their equivalents, and an additional semester course in chemistry or biological sciences, such as Chemistry 207. Geological Sciences 101–102 or 201 are recommended, but a student with a strong foundation in mathematics and science may be accepted as a major without completion of 101–102 or 201.

 Majors take the five core courses in geological sciences, a summer field geology course, 6 credits of additional course work from geological sciences courses numbered 300 or 400, plus an additional course in mathematics, physics, chemistry, or biology at an intermediate or advanced level.
Courses
For course descriptions see the Geological Sciences listing in the College of Engineering.

101 Introductory Geological Sciences Fall, spring, or summer. 3 credits.
2 lecs, 1 lab, field trips, evening exams in the fall term. Fall: T. E. Jordan, A. L. Bloom; spring: W. B. Travers.
In order to better harmonize human endeavor with the natural earth, we need to know what is natural on earth. This course teaches observation and understanding of landscape, including coasts, rivers, valleys, and glaciated regions; the genesis of earthquakes, volcanoes, and mountains; evidence for the drifting of continents and its consequences; and the origin, discovery, and development of mineral and water resources. The lab teaches use of topographic and geologic maps and recognition of minerals and rocks and includes field trips to Cascadilla Gorge, Fall Creek, and Enfield Glen.

102 Introduction to Historical Geology
107 Frontiers of Geology I
108 Frontiers of Geology II
201 Introduction to the Physics and Chemistry of the Earth
210 Introduction to Field Methods in Geological Sciences
212 Intersession Field Trip
214 Western Adirondack Field Course
262 Mineral and Energy Resources and the Environment
326 Structural Geology
345 Geomorphology
355 Mineralogy
356 Petrology and Geochemistry
375 Sedimentology and Stratigraphy
388 Geophysics and Geotectonics
410 Field Geology
412 Experiments and Techniques in Earth Sciences
424 Petroleum Geology
431 The Earth's Crust: Structure, Composition, and Evolution
432 Digital Processing and Analysis of Geophysical Data
434 Interpretation of Seismic Reflection Data
442 Glacial and Quaternary Geology
453 Modern Petrology
455 Isotope Geology
456 Chemical Geology
461 Mineral Deposits
462 Mineral Exploration
474 Modern Depositional Systems
476 Sedimentary Basins: Tectonics and Mechanics
479 Paleobiology
487 Geophysical Prospecting
489 Earthquakes and Tectonics
490 Senior Thesis
491–492 Undergraduate Research
600–699 Seminars and Special Work
621 Tectonic and Stratigraphic Evolution of Sedimentary Basins
622 Advanced Topics in Structural Geology
623 Marine Geology
625 Rock and Sediment Deformation
631 Plate Tectonics and Geology
641 Advanced Geomorphology Topics
651 Petrology and Geochemistry
653 Mineralogy and Crystallography, X-Ray Diffraction, Microscopy, High-Pressure/Temperature Experiments
655 Advanced Topics in Petrology and Tectonics
662 Advanced Topics in Petroleum Exploration
671 Advanced Topics in Sedimentology and Stratigraphy
673 Paleoecology
680 Seismic Record Reading
681 Geophysics, Exploration Seismology
683 Earthquakes and Tectonics
685 Exploration Seismology, Gravity, Magnetics
687 Geophysics, Seismology, and Geotectonics
689 Research on Seismic-Reflection Profiling of the Continental Crust
691 Philippine Geology and Tectonics
693 Andes Seminar
695 Computer Methods in Geological Sciences
721 Marine Tectonics
722 Advanced Structural Geology I
724 Advanced Structural Geology II
728 Geology of Orogenic Belts
735 Advanced Geophysics I
737 Advanced Geophysics II
781 Geotectonics
787 Seismology

German Literature
A. Groos, chairman; H. Deinert, director of undergraduate studies; B. Buettner, I. Ezergailis, S. L. Gilman, P. U. Hohendahl, C. A. Martin, L. M. Olschier
The Department of German Literature offers courses in German, medieval German, Yiddish, and Old Icelandic literatures, which reflect the heterogeneous composition of the department. These courses range from close readings of major texts through courses in culture and intellectual history. Major areas of specialization cover the period from the early Middle Ages to the twentieth century, with emphasis on literature since 1750. The department often cosponsors courses with the Departments of Music, History of Art, Theatre Arts, History, Government, and Comparative Literature and with the Medieval Studies and Women's Studies programs.
For information about majors and courses, see Modern Languages, Literatures, and Linguistics.

Government
Government is what Cornell calls a department that elsewhere might be termed political science. The focus of this discipline is power applied to public purposes. Some faculty concentrate on purposes, some on applications. Some engage in the close reading of great texts of political philosophy, while others analyze the behavior of power-wielders and publics in this and other societies. Government is divided into four subfields: United States politics, comparative politics (other nations), political theory (philosophy), and international relations (transactions between nations).
To accommodate new courses or course changes, a supplementary announcement is prepared by the department. Before enrolling in courses or registering each term, students are requested to consult the current supplement listing courses in government, available in 125 McGraw Hall.
The Major
To be admitted to the major, a student must have passed or be currently taking two government courses, one an introductory course, the second any other course offered by the department, including Freshman Seminars.

To complete a major in government, the student must (1) pass three of the four introductory courses; (2) accumulate 24 credits in courses numbered 300 or higher, including one seminar; and (3) complete 12 credits in related fields, again at the 300 level or higher. All courses used to fulfill a government major must be passed with a letter grade. Majors are urged to complete the introductory course requirement early in their stay at Cornell.

Seminars are those courses numbered 400, 490, and 500, plus whatever additional courses the director of undergraduate studies may designate. To be admitted to a seminar, students apply during the course scheduling period held the previous semester. Related fields normally include courses offered by these departments: Anthropology, Economics, History, Psychology, and Sociology. Majors should discuss their selection of related courses with their advisers. When approved by an adviser or by the director of undergraduate studies, courses from still other departments may be used to fulfill this requirement.

Cornell-in-Washington program. Government majors also have an opportunity to apply to the Cornell-in-Washington program, in which students take courses and undertake a closely supervised externship during a fall or spring semester. For further information see p. 10.

European studies concentration. Government majors may elect to group some of their required and optional courses in the area of European studies, drawing from a wide variety of courses in relevant departments. Students are invited to consult Professors P. Katzenstein, Scheinman, and Tarrow for advice concerning course selection, foreign study programs, etc.

International relations concentration. See the description under "Special Programs and Interdisciplinary Studies."

Honors. Each fall a small number of seniors enter the honors program. To apply, junior majors submit applications in May. Along with a fuller description of the honors program, application forms are available in 125 McGraw. The three courses comprising the honors sequence (honors courses) are described below.

Introductory Courses
Students registering for introductory courses should register for the lecture only. Sections will be assigned during the first week of class.

111 The Government of the United States
Spring or summer. 3 credits.
T. J. Lowi, B. Ginsberg.
An introduction to government through the American experience. Concentration on analysis of the institutions of government and politics as mechanisms of social control.

131 Introduction to Comparative Government and Politics
Fall or summer. 3 credits.
M. J. Esman.
A survey of the institutions, processes, and major problems of politics and government in contemporary states. The structures and ideologies of different regimes, the relationships of individuals and groups to the state, the shaping and implementation of public policy, the regulation of political conflict, and the adaptation of political systems to changing conditions. Particular attention is paid to the government and politics in Great Britain, France, the Soviet Union, China, Nigeria, and Mexico.

161 Introduction to Political Theory
Spring or summer. 3 credits.
J. Kramnick.
A survey of the development of Western political thought from Plato to the present. Readings from the work of the major theorists: an examination of the relevance of their ideas to contemporary politics.

181 Introduction to International Relations
Fall or summer. 3 credits.
P. Katzenstein.
An introduction to the basic concepts and practice of international politics.

Freshman Seminars
100 Freshman Seminars
Fall, spring, or summer. 3 credits. Seminars will be offered in both the fall and spring terms. Consult the listings for the Freshman Seminar Program in the section "Special Programs and Interdisciplinary Studies," the supplement issued by the department, and the Freshman Seminar booklet for course descriptions and instructors.

Major Seminars
400 Major Seminars
Fall or spring. 4 credits.
These seminars, emphasizing important controversies in the discipline, cap the majors' experience. Thus preference in admission is given majors over nonmajors and seniors over juniors. Topics and instructors change each semester. To apply, students should pick up a form in 125 McGraw during the course selection period the semester before the seminar is given.

The following courses are open to sophomores, juniors, and seniors without prerequisites unless otherwise indicated.

American Government and Institutions
Government 111 is recommended.

306 Sex Discrimination: Law and Social Policy (also Women's Studies 372 and Sociology 372)
Fall. 4 credits.
C. Bohmer.
This course will cover the current legal and social trends in the area of sex discrimination. The relationship between feminist consciousness and organization and developments in gender-related constitutional law and legislation will be examined. Focusing on such topics as education, employment, gay rights, and reproductive control, the course will analyze the relationship between legal change and sociopolitical change as it affects equal rights.

309 Interpretation of American Politics
Fall. 4 credits.
R. King.
This course shall attempt to move beyond description of specific institutions and policies to initiate a more theoretical discussion of the general characteristics of the polity that exists in America. We will read and discuss major works from various schools of interpretation bearing on the questions, Who rules America, and how is it ruled?

310 Power and Poverty in America
Spring or summer. 4 credits.
R. King.
America, despite egalitarian democratic rights, remains a stratified society conscious for great disparities in the allocation of income and wealth. The purpose of this class is to investigate these disparities, both empirically and normatively, and to assess the impact of government upon them. Topics for discussion will include What do we mean by distributional inequality and by the demand for greater egalitarianism? What is the extent of inequality and of poverty in America today? How does one establish minimum standards for distributional justice? Is the United States currently on the road toward achieving that minimum standard? What is the array of federal welfare programs presently available, and what is their effect? How does one understand the role of the welfare state in advanced capitalism, and what different forms has it assumed in different countries? How do we explain its particular American manifestation? What reforms are currently on the political agenda? Can we imagine a society somewhat like that in America achieving a very different distributional result?

[311 Urban Politics 4 credits. Not offered 1986–87]

312 Urban Affairs Laboratory
Fall or spring. 4 credits. Open to both undergraduate and graduate students. Application required to assure balanced enrollment from different colleges and majors. Applications available in 125 or B29 McGraw Hall. Course fee, $20.
E. W. Kelley.
An interdisciplinary course in urban affairs that emphasizes learning through participation in a complex gaming simulation. Students assume roles of decision makers in a simulated city and test their solutions to environmental, economic, social, and political problems. Issue-related readings and lectures provide complementary theoretical focus.

[313 The Nature, Functions, and Limits of Law
Fall or spring. 4 credits.
K. Clermont and staff.
A general education course for students at the sophomore and higher levels. Law is presented not as a body of rules but as a set of varied techniques for resolving conflicts and dealing with social problems. The roles of courts, legislatures, and administrative agencies in the legal process is analyzed, considering also the constitutional limits on their power and practical limits on their effectiveness. Readings consist mainly of judicial and administrative decisions, statutes and rules, and commentaries on the legal process.


[317 Political Parties and Elections
4 credits. Not offered 1986–87]

318 The American Congress
Fall. 4 credits.
M. Sheller.
The role of Congress in the American political system. Topics to be discussed: the political setting within which Congress operates, the structure of Congress, the salient features of the legislative process, and recent congressional behavior in a number of policy areas.

[321 Public Policy and Public Revenues
4 credits. Not offered 1986–87]

[322 Criminal Justice 4 credits. Not offered 1986–87]

[323 The "Fourth" Branch 4 credits. Not offered 1986–87]

327 Civil Liberties in the United States
Spring. 4 credits.
J. Rabin.
An analysis of contemporary issues in civil liberties and civil rights, with emphasis on Supreme Court decisions. Cases are analyzed in terms of democratic theory and the social and political context in which they arose.

328 Constitutional Politics: The United States Supreme Court
Fall. 4 credits.
J. Rabin.
The course investigates the role of the Supreme Court in American politics and government. It traces the historical development of constitutional doctrine and the institutional role the Court has played in American politics.

[329 Race, Gender, and Politics 4 credits. Not offered 1986–87]
4 credits. Not offered 1986–87

403 Cleavages and Conflicts in Contemporary American Politics 4 credits. Not offered 1986–87


This course will explore the evolution of the welfare state, including the development of its distinctive legal and bureaucratic institutions. It will also trace the continued delegation of public authority to private groups at both national and local levels of government. Patterns of political-economic institutions will be used to explain who receives social and economic goods through the public sector and the repeated occurrence of such problems as “stagnation.”


407 Law, Science, and Public Values Fall. 4 credits. S. Jasanofo.

This course explores the varied interactions between science and the legal process that have developed in recent years as a result of attempts to bring greater public accountability to the use of science and technology. It examines the activities of both legislatures and courts in controlling science and analyzes the values underlying these initiatives. Three major types of science-law interactions form the focus of the course: regulation of new technologies, judicial review of risk-management decisions, and legal control of professional standards in science and technology. Specific topics include the regulation of toxic chemicals and nuclear power, controversies about biotechnology, reproductive technologies and biomedical research, and science fraud.

408 Class, Race, and Interest Groups in U.S. Politics Fall. 4 credits. M. Goldfield.

The dominant model for analyzing U.S. politics at the national level in this country has been the pluralist one. Here, interest groups compete in the governmental arena for their share of the spoils. Yet, it is arguable that business groups or business as a whole, labor unions or labor, and national minorities, especially blacks, do not fit easily into this typology. This course will examine the proposition that our pluralist model and nonpluralist sources, that ruling class domination, working class opposition, white supremacy, opposition to racist oppression are more central to the workings of U.S. politics than is commonly supposed.


412 Size of the State 4 credits. Not offered 1986–87

414 The Administrative State Spring. 4 credits. J. Rubins.

This course will examine the problem of how—or whether—legitimate governmental authority can be distinguished from arbitrary coercion in a modern era of pervasive regulation. It will consider, in turn, several different theoretical approaches to this problem, as illustrated in the works of modern legal and social theorists, in some landmark cases in the history of American administrative law, and in a representative sampling of modern cases. But the course will also look at several case studies of the regulatory process in today's world, suggesting the difficulties of applying—or putting much reliance on—these accepted approaches in actual practice.

418 Labor in American Politics Spring. 4 credits. M. Goldfield.

This course will deal with the nature of American politics. It will begin by examining the various theories of "American exceptionalism." It will consider the arguments that the key to understanding U.S. politics, its main springs, its Soviet system and on of labor's weakness and the degree to which any of the theories of "American exceptionalism" has merit.

422 Selected Topics in Public Policy 4 credits. Not offered 1986–87

423 Labor and the New Deal 4 credits. Not offered 1986–87

424 Political Change in the United States Fall. 4 credits. Prerequisite: permission of instructor. T. L. Lowi.

Government 428 concentrates on history and criticism of U.S. policies and the politics associated with them. Particular attention is given to the origins and character of the regulatory state and the welfare state. Government 429 is an opportunity to pursue further the research begun in 428.

Comparative Government

Government 131 is recommended.


Introductory interdisciplinary survey of Poland, Hungary, Czechoslovakia, and Yugoslavia since World War II, with emphasis on contemporary developments. The goals of the course are to examine differences among East European countries as well as common elements (for example, variety of backgrounds, political relations with the U.S.S.R., domestic situations, and the economies and cultures).


332 Politics and Society in France and Italy Fall. 4 credits. S. G. Tarrow.

A comparative treatment of the political traditions, governmental institutions, and policy problems of two countries with deep social cleavages, vigorous multiparty systems, and special connections to the United States. Special attention is given to problems of economic planning and social policy, the role of the Communist party in each country, and the place of Italy and France in Europe.

333 Government and Politics of the Soviet Union Fall. 4 credits. M. Rush.

The politics of the top leaders, the institutions through which they operate, and the impact of their policies on the Soviet people. Emphasis is also on phases in the development of the Soviet system and on the ways in which the Soviet Union served as the prototype for all subsequent Communist states.


336 The Ethnic Dimension in Politics Fall. 4 credits. J. Bontusson.

The origin, expression, and regulation of political competition and conflicts arising from ethnic, linguistic, racial, and religious pluralism. The political problems of communally divided societies are examined from a comparative perspective to determine what patterns of coexistence are possible in ethnically plural societies. Data are drawn from several countries, including Canada, Malaysia, South Africa, and Israel, as well as the United States.

338 Society and Politics in Britain and Scandinavia Spring. 4 credits. J. Pontusson.

This course provides a general introduction to the politics of Britain, Sweden, Denmark, and Norway. It focuses on the expansion of the welfare state in the postwar period and the current crisis of welfare politics.

339 Formation of European Nation-States Spring. 4 credits. Limited to 50 students. E. Kerworthy.

An introduction to the politics and society of key Latin American nations, combining a conventional overview (readings, examination) with simulations of current crises (research, role-playing).

341 Society and Politics in Central Europe 4 credits. Not offered 1986–87


343 Contemporary European Society and Politics (also History 283) Fall. 4 credits. J. Pontusson, J. Weiss.

An interdisciplinary course in the culture, politics, and contemporary history of Western Europe, with an emphasis on popular culture and community life in particular cultural areas and their development in recent European history. Topics include childhood, education, and youth revolt; religion and social class; community life and politics; the formation of nationality and statehood; movements; and Americanization and European unity.

344 Government and Politics of Southeast Asia 4 credits. Not offered 1986–87

345 Contemporary European Society and Politics (also German Literature 285 and History 285) 4 credits. Not offered 1986–87

346 Politics in Contemporary Japan Spring. 4 credits. T. J. Ohi.

The focus will be on the political, social, and economic delimiters of policy making in postwar Japan, with some particular attention given to ideological conflict, political parties and elections, the bureaucracy, the consumer movement, student protest, defense policy, and economic penetration of Southeast Asia.

347 Chinese Government and Politics Fall. 4 credits. M. Bernal.

An introduction to the main currents in China's domestic politics over the last fifty years. Topics include the Communist Party's revolutionary rise to power, Maoist philosophy, peasants and communes, radical idealism and mass mobilization, bureaucratic politics, and the recent turn toward "market socialism."
146 Arts and Sciences

[348 Politics of Industrial Societies 4 credits. Not offered 1986–87]

349 Political Role of the Military Spring. 4 credits.
B. Anderson.
Comparative study of the political consequences of the global arms spread, since the early nineteenth century of professionally officered, industrially equipped militaries. Case studies of selected European, Asian, African, and American states will investigate the relationships of these militaries to nationalism, imperialism, technological innovation, and munitions industries, as well as class, ethnic, and religious conflict. Special attention will be paid to the peculiarities of the modern military’s organizational structure in shaping its political roles.

350 Comparative Revolutions Fall. 4 credits.
M. Bernal.
An analysis of the French, Russian, and Chinese revolutions, treating their social, cultural, and political origins as well as their ideology and organization. Special emphasis is given to the nature of the state to which they are opposed and the course of the revolutionary struggle.

351 India: Social and Economic Change in a Democratic Polity 4 credits. Not offered 1986–87]

352.1 Political Concepts in the Modern Middle East: Religion and State (also Near Eastern Studies 294) Spring. 4 credits.
A. Susser
The seminar will focus on the problems involved in the application of the "nation-State" concept in the modern Middle East: religious and ethnic minorities and their impact on domestic politics, and the role of resurgent Islam and its impact on the Arab-Israeli conflict.

353 Feminist Movements and Public Policy 4 credits. Not offered 1986–87]

354 America in the World Economy Fall. 4 credits.
P. Katzenstein.
Unemployed auto workers in Detroit and the wood stoves in New England signal an important change in America's relation to the world economy. This course characterizes these changes in a number of fields (trade, money, energy, and technology), explains them as the result of the political choices of a declining imperial power that differ substantially from the choices of other states (Japan, Germany, Britain, France, the small European states, and Korea), and examines their consequences for America and international politics.

355 Contemporary Revolutions Spring. 4 credits. Prerequisite: Government 350 or permission of instructor.
M. Bernal.
The course is a continuation of Government 350. It will be concerned with revolution since 1956 and especially with those in "dependent" countries, that have not been preceded by international war. Particular attention will be paid to the revolutions in Hungary, Cuba, Nicaragua, and Iran. African revolutions and the potential for revolution in South Africa will also be considered.

356 Elites and Society: The Political Economy of Power Spring. 4 credits.
N. T. Uffhoff.
For students who have an interest in the nature and uses of power in politics. Consideration of how power has been treated by earlier political thinkers and by contemporary social scientists. Propositions will be formulated and critiqued about the distribution and consequences of power in America, in other industrialized societies, and in the Third World, and their implications for the making of public policy. A game simulation, Third World Power Play, is undertaken at the end of the course.

357 Political Development in Western Europe 4 credits. Not offered 1986–87]

358 Politics of the Middle East (also Near Eastern Studies 294) Fall or summer. 4 credits.
A. Susser.
An examination of the Middle East conflict, including domestic and foreign determinants or Arab and Israeli policy. The impact of major-power conflict on Middle Eastern politics, the sources of instability in local regimes, and the problem of small-state dependence on the superpowers.

365 Social Movements and Politics in Industrial Societies Fall. 4 credits.
S. G. Tarrow.
Studies of historical and contemporary social movements and left-wing parties in Western Europe and the United States, with an emphasis on the relations between movement strategies, political alliances, and policy outcomes.

[430 The Politics of Productivity: Germany and Japan 4 credits. Not offered 1986–87]

[431 Theories of the State 4 credits. Not offered 1986–87]

432 Labor and Politics Fall. 4 credits.
J. Pontious.
This course explores the dual role of unions as economic and political actors in several advanced industrial countries: Britain, France, Sweden, Japan, and the United States. We will try to determine what labor movements in these countries have in common, as well as how and why they differ.

434 State and Economy in Advanced Capitalism 4 credits. Not offered 1986–87]

446 Comparative Communism Spring. 4 credits.
M. Rush.
This seminar deals with regimes that claim to be committed to the Marxist-Leninist program for the realization of socialism and communism. Similarities and differences among countries of the Soviet bloc, China, and Yugoslavia are investigated.

454 The Herodotean Moment: The Uses and Abuses of "Western Civilization" (also History 454) Spring. 4 credits. Prerequisite: permission of instructor.
M. Bernal, J. Najemy.
The basic premise of the seminar is that the concept of Western civilization is a problematic one in need of critical analysis. The course will examine the historical evolution of the concept as seen in selected moments of actual and perceptual encounter with other civilizations. It will also inquire into the political uses and abuses of the concept, as well as its discursive, psychological, and anthropological dimensions.

[457 Comparative Public Law: Legal Controls on Government in Europe and America 4 credits. Not offered 1986–87]


Political Theory Government 161 is recommended.

361 Modern Ideologies: Liberalism and Its Critics Fall. 4 credits.
U. Mehta.
Since the rise of capitalism, one political ideology has been dominant in the Western world—liberalism. However, its hegemony has been questioned by a series of critics: democracy, socialism, anarchism, conservatism, Freudianism, and feminism. This course will study the tensions between liberalism and these critics and speculate on the possible survival or extinction of this venerable and very American ideology.

362 Directions in Feminist Theory (also Women's Studies 365) 4 credits.
C. A. Martin.
This course is designed to explore developments in contemporary feminist theory with particular attention to feminist critiques, reinterpretations, and uses of Marxist, psychoanalytic, and (post)structuralist thought. We will be concerned throughout the course both with the ways in which radical feminist questions converge with developments in these fields and the ways in which feminist analyses challenge some of the most basic assumptions embedded in these and other social theories. We will consider the approaches of a variety of feminist thinkers to the relations between "patriarchy" and the political, economic, and racial hierarchies that structure various social systems and ideologies.

363 Classics in Political Thought 4 credits. Not offered 1986–87]


366 Feminism, Sexuality, and the Politics of Identity (also Women's Studies 366) 4 credits. Not offered 1986–87]

373 Feminist Political Thought 4 credits. Not offered 1986–87]

375 American Political Thought 4 credits.
Not offered 1986–87
In roughly chronological sequence the following topics will be emphasized: the Declaration of Independence, the Constitution, The Federalist, the Civil War and the political thought of Abraham Lincoln; black political thought; and pragmatism. Consideration will be given not only or even primarily to treatises, but to documents, speeches, and fiction.

376 Marx Fall. 4 credits.
S. Buck-Morss.
The meaning and contemporary relevance of the central concepts of Marxist theory: dialectics, class, ideology, history, social revolution, the state, the family, imperialism, modes of production, the "iron laws" of capitalism, and the communist goal. Readings in the original texts.

379 Freud 4 credits. Not offered 1986–87]

465 Philosophy of Social Science Spring. 4 credits.
M. Goldfield.
This course will examine the general question of the degree to which the study of politics can be scientific. Or, put another way, to what degree are broad theories of society, even ethical theories, necessary in order to understand politics in any meaningful way? The course will focus on discussions about the nature of politics and the nature of the study of politics in the works of both traditional and contemporary philosophers of social science.

[466 The Repressed Feminine in the Writings of Marx (also Women's Studies 466) 4 credits. Not offered 1986–87]

467 Current Topics in Political Philosophy (also Women's Studies 467) 4 credits. Not offered 1986–87]

468 The Theory and Politics of Liberal Feminism (also Women's Studies 468) 4 credits. Not offered 1986–87]

International Relations Government 161 is recommended.

287 Learning about Learning in International Relations 4 credits. A Common Learning course. Not offered 1986–87]

381 The Politics of Defense Spending Fall. 4 credits.
J. Reppy.
An analysis of U.S. military programs and budgets in the post–World War II period. Topics will include an overview of the defense budget process, special characteristics of the defense market, behavior of defense firms, and domestic factors shaping the arms race. There will be occasional guest lectures by visitors to the Peace Studies Program.

382 Integration in the World System

383 Theories of International Relations

384 War and Peace in the Nuclear Age (also Physics 206)
Spring. 4 credits. Staff.

Intended for students wishing to understand the following: the principles, types, and effects of nuclear weapons; existing and proposed arsenals and delivery systems; and the prospects for a stable global system. The course will provide a framework for thought on the proper role of military power and the respective roles of military and civilian leaders in formulating and implementing military strategy on the nuclear powers and the history of nuclear arms control negotiations. Additionally, the course will examine critically the important concepts involved in military strategy and arms control, current issues in military posture and arms control negotiations, and the moral and ethical questions involved.

385 Contemporary American Foreign Policy
Fall. 4 credits. S. Jackson.

An analysis of the dilemmas that have confronted American foreign policy since 1945, both specific problems and more-general questions of capabilities, priorities, and morality.

386 Structure and Process in the Global Political Economy

387 The United States and Asia
Spring. 4 credits. G. McT. Kahn.

The interaction of the United States with the major states of Asia and with those smaller countries (especially Vietnam) with which it has been particularly concerned are analyzed. Attention is also given to the relationship of American policy to the Asian policies of France, Great Britain, and Soviet Russia.

388 War and Society: The Origins of the First World War, 1870–1919 (also History 379)

389 International Law

390 Principles of Strategy
Spring. 4 credits. R. N. Lobeck.

This course will acquaint students with the fundamentals of strategy: that is, with the political uses of military power and the respective roles of military and civilian leaders in formulating and implementing foreign policy. In a broader sense its purpose is to sensitize the student to the complexity of the policy-strategy-making process and to enhance his or her own ability to think strategically. We will analyze historical as well as contemporary strategic problems in order to demonstrate the recurring nature of the questions that have taxed the genius of soldiers and statesmen.

391 U.S. National Security Policy
Fall. 4 credits. M. Heller.

The purpose of this course is to familiarize students with the basic concepts, terminology, and process of American security policy as reflected in both public debate and actual force planning. An introductory survey of the role of force in international relations and the evolution of American strategy since World War II will be followed by a detailed analysis of the current strategic balance between the United States and the Soviet Union. After that, some other issues on the politics-military agenda will be examined. These include arms control, proliferation, the conventional balance in Europe, policy making, and the relationship between security planning and democratic values.

392 International Relations of the Middle East
Spring. 4 credits. M. Heller.

This course will examine patterns of international relations in the Middle East in the twentieth century, with special reference to the Arab-Israeli and Iran-Iraq conflicts. These conflicts will be treated as part of a Middle East system, where other main elements are the interaction between domestic and external politics, inter-Arab relations, and the involvement of regional powers.

397 Accumulation on a World Scale

399 Dependencia and the State

480 International Political Economy
Fall. 4 credits. D. Sylvan.

The differential production of wealth and power in the world. Three principal topics: (1) development of the international division of labor; (2) growth models, the international financial system, and the current "debts crisis"; and (3) hegemony and the possibilities of revolutionary change.

481 Foreign Policy of the U.S.S.R.
Spring. 4 credits. M. Rush.

An analysis of Soviet foreign policy, as it developed out of the revolution and accommodated to the prevailing international system, with a focus on the period since 1945. Particular topics include causes and prospects of the cold war, the impact of nuclear weapons on Soviet defense and foreign policy, sources and goals of Soviet hegemony in East Europe, causes of the dispute with China, and the impact of domestic politics on the formation of foreign policy.

483 Political and Economic Interdependence

484 Defense Strategy


487 Covert Intervention as an Instrument of American Foreign Policy

488 Comparative Capitalism

489 International Law and Regime Development

Honors Courses
Each April a limited number of junior majors are admitted to the honors program, their work to begin the following fall. Application forms and a full description of the program may be obtained in 125 McGraw Hall. Students who have successfully completed Government 490 or 500 or who are taking 490 concurrently.

490 Honors Seminar: Research Methods
Fall. 4 credits. Limited to students admitted to the honors program.

494 Honors Thesis Clarification and Research
Fall. 4 credits. Limited to students who have successfully completed Government 490 or 500 or who are taking 490 concurrently.

499 Honors Thesis: Research and Writing
Spring. 4 credits. Limited to students who have successfully completed Government 494.

Students continue the work of the preceding semester, typically with the same faculty tutor. Research on the thesis is completed and writing begun. The tutorial culminates in a thesis of some sixty to eighty pages. The grade for the tutorial is determined by the faculty tutor, while the degree of honors (if any) awarded the thesis is decided by a committee of faculty members established for that purpose.

Supervised Study
Except under very unusual circumstances, supervised study, Government 499, is open only to government majors doing superior work in the major. The application form may be obtained in 125 McGraw Hall and must be approved by the director of undergraduate studies for credit to be granted. There is no limit established for the total number of credits a government major may take in Government 499 while at Cornell, but he or she may count no more than 4 credits toward fulfilling the major. Students who want to continue taking the course for more than one semester must select a new theme or subject each semester, and applicants must present a well-defined program of study that cannot be satisfied by taking regular courses. Credit can be given only for work that results in a satisfactory amount of writing. Emphasis is on the capacity to subject a body of related readings to analysis and criticism. Permission of the instructor is required.

499 Readings
Fall or spring. 1–4 credits. Staff.

Graduate Seminars
Qualified undergraduates are encouraged to apply for seminars listed with 600 course numbers. Students may consult the supplement that lists graduate courses, available in the department office.

Field Seminars
601 Scope and Methods of Political Analysis
Fall. 4 credits. M. Goldfield.

This seminar offers an overview of the main problem areas and theoretical orientations in the four subfields of contemporary political analysis: political theory, American politics, comparative politics, and international relations. Selected topics, including questions of research design, are treated through a reading of the best contemporary literature. The broad issues of the philosophy of social science or specific techniques of analysis may also be addressed.

602 Field Seminar in Political Methodology
Fall. 4 credits. E. W. Kelley.

Some attention is given to general problems of research design and hypothesis formulation. Emphasis is on measurements and hypothesis testing. Topics to be covered include statistics, both parametric and nonparametric; unidimensional and multidimensional scaling; data theory; and causal modeling.

603 Field Seminar in American Politics
Fall. 4 credits. B. Ginsberg, M. Shaffer.

The basic issues and institutions of American government and the various subfields of American politics are introduced. The focus is on substantive information and theoretical analysis and problems of teaching and research.

604 Field Seminar in Public Policy
Fall. 4 credits. E. W. Kelley.

An introduction to the study of public policy. Various analytical approaches will be presented: models of
public choice and political economy; analysis of bureaucratic politics, executive and political leadership, and interest groups and public opinion; economic analysis of public finance and welfare economics; and organization theory, game theory, and decision theory as these relate to the analysis of public policy formation and applications.

605 Field Seminar in Comparative Politics Fall. 4 credits. S. G. Tarrow.
An introduction to selected theoretical problems in the study of comparative politics and to their application in empirical analysis. Basic problems are social class and politics, authority and legitimacy, participation and mobilization, economic development and democracy, authoritarian and totalitarian politics, corporatism and pluralism, and nation building and political integration.

606 Field Seminar in International Relations Spring. 4 credits. P. Katzenstein.
A general survey of the literature and propositions of the international relations field. Criteria are developed for judging theoretical propositions and are applied to the major findings. Participants will be expected to do extensive reading in the literature as well as research.

607 Field Seminar in Political Thought Spring. 4 credits. Staff.
An introduction to political theory through a reading of selected classics in political thought from Plato to Marx.

American Government and Institutions


Public Policy

628 Politics of Technical Decisions I (also Sociology 515, City and Regional Planning 541, Management NBA 686, and Biology and Society 415) Fall. 4 credits. D. Nekin.
Political aspects of decision making in technical areas. Drawing from recent risk disputes, we will examine the origins and characteristics of "technical politics," the role of experts in government, and the problem of expertise in a democratic system.

629 Politics of Technical Decisions II (also Sociology 516, City and Regional Planning 542, and Management NBA 687) Spring. 4 credits. Prerequisite: Government 628 or permission of instructor. D. Nekin.
Continuation of Government 628. Political aspects of decision making in technical areas. Drawing from recent risk disputes, we will examine the origins and characteristics of "technical politics," the role of experts in government, and the problem of expertise in a democratic system.

Comparative Government


639 Politics of the Soviet Union Fall. 4 credits. M. Rush.
A reading seminar on major works dealing with the Soviet political system, with special emphasis on higher politics, recent foreign policy, extended crises of economic growth, and political succession.


648 Political Economy of Change: Rural Development in the Third World Fall. 4 credits. N. T. Uphoff.
The seminar analyzes strategies for economic, social, and political change, using an approach that integrates economic, social, and political factors into a common framework dealing with policy choices and political action. Attention focuses particularly on developing local capacities for initiative and implementation with broader participation from rural communities.

651 Agrarian Change in South Asia: Politics, Society, and Culture Fall. 4 credits. N. T. Uphoff.
An interdisciplinary examination of the sources and consequences of change in rural societies, particularly India, Nepal, and Sri Lanka. The alternatives of party and nonparty political systems, of efforts to change social relations (like caste) or to accommodate them, and of importing "Western" attitudes and values versus defending "Asian" ones will be considered. Some attention will be given to economic and agricultural matters, but they will not be the main focus of the course.


653 The Plural Society Revisited (also Asian Studies 607) Fall. 4 credits. B. Anderson.
John Fournival's concept, developed forty years ago, posited colonial society as one in which race (and ethnicity), class, occupation, and residence were distributed more or less isomorphically. The seminar will review the utility of the concept in the light of subsequent research on colonial Southeast Asia and its applicability to developments since the achieving of independence. It will also consider the relevance of the concept to (unrecognized) modern Thailand. The core problematic will be the relationship between classification (racing) and power.


659 Politics in Postwar Western Europe Spring. 4 credits. S. G. Tarrow.
This course is a survey of the post-World War II European political systems that will use some major approaches to the politics of advanced industrial democracies to analyze the main periods and problems of postwar European politics. The periods and topics covered are reconstruction, the transition to mass democracy and the growth of the welfare state; mature party-systems, neocorporatism and the "end" of ideology; the resurgence of class conflict, party dealignment and "postindustrial" cleavages; and no-growth politics, realignment, and attacks on the welfare state. Students will prepare critical review essays on particular theoretical problems or on particular countries in Western Europe.


The political, bureaucratic, economic, and technical environments of administration for agricultural and rural development; the various functions involved in administration (personnel management, planning, budgeting, economic analysis, information systems); several major tasks (research, extension services, and infrastructure development); and specific problems of integrating activities, interfacing with rural populations, and utilizing external assistance. Intended primarily for persons who expect to have some future responsibilities in agricultural or rural development administration and Third World countries.

Political Theory


A close textual reading of Thus Spoke Zarathustra and selected other books by Nietzsche. Nietzsche will be studied both "in himself" and as a seminal influence on fascism as well as existentialism.


669 Modern Social Theory I Fall. 4 credits. S. Buck-Morss.
Readings vary, but topics are drawn from the traditions of Marx, Weber, Durkheim, the Frankfurt School, and Freud. They include political economy, the transformation to "modernity," ideology as the legitimation of power, and social institutions as social constraints. The methods of critical theory, structuralism, poststructuralism, and feminism will be considered.

670 Modern Social Theory II Spring. 4 credits. S. Buck-Morss.
Issues will include neo-Marxism, critical theory, poststructuralism, and feminism.

International Relations

680 International Security Spring. 4 credits. R. N. Lebow.
A review of the relevant literature in the field of international security. Special emphasis will be given to different conceptual approaches to understanding security problems and the formulation of national security policies.


687 International Relations of Asia Spring. 4 credits. S. Tarrow.
Studies of the relations of China, Japan, Korea, and the countries of Southeast Asia with one another and with the United States and the Soviet Union, with particular attention to the influence of domestic political factors.
Greek
See Department of Classics.

Hebrew
See Department of Near Eastern Studies.

Hindi-Urdu
See Modern Languages, Literatures, and Linguistics.

History

The popularity of history among Cornell students is due to its usefulness as preparation for graduate, professional, or law school and for any career that requires critical thinking and good writing; the reputation of the faculty for scholarship, teaching, and advising; and most of all, the intrinsic interest of the discipline. A wide variety of introductory and advanced courses is offered. The department is particularly strong in ancient, medieval, and modern European history; in American, Latin American, Chinese, and Southeast Asian history; and in the history of science.

The Major
To complete the history major, a student must fulfill the requirements listed below:
1) Complete the prerequisite requirement by taking either Introduction to Western Civilization in History (151—152) or Introduction to Asian Civilizations in History (190—191) or, alternatively, three courses in European history—one in ancient history; one in medieval, Renaissance, or early modern history; and one in modern history.
2) Take history department courses totaling 36 credits (which may include the prerequisite courses) and complete all these courses with a grade of C or better. Of the 36 credits, a minimum of 20 must be taken in courses numbered 250 and above.
3) Take a minimum of 8 credits in each of two of the following fields: American, European, Asian, or Latin American history or history of science. Alternatively, a student may elect to take a total of 16 credits in three of these fields. Credits taken to fulfill the prerequisite requirement (see item 1, above) do not count toward these requirements.
4) Take at least one course at the advanced (400 or higher) level.
5) Take two courses above the elementary level offered by other departments that relate to the student's area of special interest.
Prospective majors may wish to discuss their projected program with the director of undergraduate studies before formally enrolling with the department.

Honors. History majors with an overall B+ average in all their history courses are eligible to enroll in History 400, Honors Proseminar, which is normally taken in the junior year or at the latest, in the fall of the senior year. (Honors candidates are strongly encouraged to take another 400-level seminar during their junior year.) Upon successful completion of the proseminar, students may become candidates for the degree of Bachelor of Arts with honors in history by submitting to a prospective faculty adviser a written thesis proposal delineating the general area of inquiry for an honors essay and having the proposal approved by the adviser. The proposal should be submitted as soon as possible after the completion of History 400, normally during the junior year or at the beginning of the senior year.

After acceptance of the proposal by an adviser, honors candidates should normally enroll with their advisers in History 401, Honors Research, during the first term of their senior year. History 401 is a 4-credit course that permits honors candidates to conduct research and to begin writing the honors essay. At the end of the first semester of the senior year, as part of the requirements for History 401, the student will submit to his or her adviser a ten-to-fifteen-page overview of the entire thesis and will undergo an oral examination on the broad field of history that the student researched. The examination will be administered by a committee consisting of the student's adviser and one other department member, who will eventually serve as a reader of the thesis. The committee will then recommend whether the student may proceed to enroll in History 402. Honors Thesis, during the final semester of the senior year. History 402 is a 4-credit course that permits honors candidates to complete the honors essay and to prepare both to defend the essay and to demonstrate their understanding of the general historical interests they have pursued with the major.

Students who do not take History 400 in their junior year must submit both the thesis proposal and the prospectus by the end of the fall semester of their senior year in order to be eligible to enroll in History 402 by their final semester.

Honors candidates must complete a minimum of 40 credits in history, 8 of which must be History 400 and 402. The completed thesis will be examined by three readers, including the two faculty members who administered the preliminary oral examination.

The test of the honors essay may not exceed sixty pages except by permission of the chairperson of the honors committee and the student's adviser. Two copies will be due during the third week of April. In May each honors candidate will be given an oral examination administered by the major adviser and one of the essay readers. The examination will focus on the specific issues of the essay as well as the broad field of history in which the student has concentrated his or her research (e.g., Periclean Athens, seventeenth-century science, nineteenth-century America).

To qualify for a Bachelor of Arts degree with honors in history, a student must (1) sustain at least a B+ cumulative average in all history courses and (2) earn at least a cum laude grade on the honors essay and on the oral examination. Students considering the honors program should consult the department during the second term of their sophomore year or early in their junior year.

Freshman Seminars

[104 Communes and Utopias: Alternative Life-Stles in American History Not offered 1986—87]
G. C. Altschuler
This course examines individual and group critiques of American society and experiments with alternative lifestyles. Topics include the Puritans, the Oneida community, the Mormons, Walden, the Ferrer Colony and Modern school, Vedanta monasteries, Walden II, and contemporary communes.

[106 Democracy and Education: History of Learning in America Not offered 1986—87]
G. C. Altschuler
A survey of the history of educational thought and institutions from Puritan times to the present, with emphasis on the nineteenth and twentieth centuries. Topics include the family and church as educational institutions, the democratization of education, the emergence of the university, educational testing, and vocational education. John Dewey and progressive education, "alternate education," student radicalism.

[107 The Family in American History Not offered 1986—87]
M. B. Norton
An examination of the American family in the context of changing times from the seventeenth century to the present day. Readings include both primary and secondary sources. Students research the past experience of their own families as part of the course.

[108 Civil Liberties in the United States Spring 3 credits. Prerequisite: permission of instructor. Not offered 1986—87]
T R 2:30—3:45. R. Polenberg
Freedom of speech and dissent from Jefferson's time to the present, with emphasis on the twentieth century. Topics include Jefferson and Madison; Lincoln and martial law; Holmes, Brandeis, and the Supreme Court; the relocation of Japanese Americans; the cold war and McCarthyism; religious cults; "brainwashing"; censorship and obscenity; John Milton, John Stuart Mill, and the critique of libertarianism.

[112 The North Atlantic Community and the Wider World Not offered 1986—87]
T. H. Holloway
The relationship between the attitudes and values of Europeans and the emergence of the global economic and political network since the Age of Discovery. The voyages of exploration, commercial expansion, and the consolidation and dissolution of modern empires are considered. Texts contemporaneous with these periods will be read and discussed to explore ways members of the North Atlantic community have explained and justified their emerging world influence in religious, racial, technological, and cultural terms.

[158 Education in the Renaissance and Reformation Fall 3 credits. Hours to be arranged. J. L. Carrington]
What role does education have in other historical events and processes, such as political and religious upheaval? This question will be one of the major concerns of the course as we examine topics in late Renaissance ideals of education and their effect on the course of the Reformation.

[171 Revolution and Russian Society Not offered 1986—87]
W. M. Pintner
The state's attempt to maintain stability, and the tension between the dissenting intelligentsia and the mass of the population are examined. Russia before and after the revolution of 1917 is discussed.

[176 Britain and the Second World War 3 credits. Prerequisite: permission of instructor. Not offered 1986—87]
T 3:35, R 2:30—4:30. D. A. Baugh
The aim is to uncover the true facts of Britain's conduct and situation from 1936 to 1946. Emphasis is on the fighting on land, sea, and in the air, but preparedness, economic warfare, diplomacy, and imperial power are considered. Topics include the Battle of Britain, the Battle of the Atlantic, and strategic bombing.

[188 The Viet Nam War Fall or spring 3 credits. Hours to be arranged. J. M. Coyle]
Students in this course will examine the war from the perspective of those who actually experienced it. Readings will be selected from essays, memoirs, and works of fiction written by participants in the war. Among the topics to be discussed are reactions to different types of combat experience, racial and generational conflict within the United States forces, perceptions of the Vietnamese, and problems of readjustment to civilian life.

[192 Japan and the West Fall 3 credits. Not offered 1986—87]
J. V. Koschmann.

[193 China and the West before Imperialism 3 credits. Open to freshmen and sophomores. Prerequisite: permission of instructor. Not offered 1986—87]
C. A. Peterson.
What accounts for the first great passion for things Chinese in the West in the seventeenth and eighteenth centuries and then its recession before the waves of imperialism? This seminar explores this question, tracing the China vogue in thought, literature, art, and the crafts and making reference to actual circumstances in the China of the day.

205 The Growth of Political Democracy in the United States Fall. 3 credits. Limited to 14 students. Prerequisite: permission of instructor. T 2:30–4:30 J. H. Silbey. An examination of the democratization of American political life since the American Revolution. Such topics as the expansion of white, black, and women's suffrage and the changing concepts of participation and leadership in American politics will be explored. A number of books and documents covering the topic will be read and discussed and several short papers written.

[214 Seminar on American Foreign Policy] Fall. 4 credits. Open to freshmen and sophomores. Limited to 14 students; preference will be given to non—history majors. Prerequisite: permission of instructor. Not offered 1986–87. T 2:30–4:25 W. LaFeber.

[219 Freshman Seminar: History of North American Indians] Spring. 3 credits. Limited to 18 students. Not offered 1986–87. T R 10:10–11:25 D. H. Usner. This seminar examines major themes in Native American history from colonial times to the present. Discussions will consider the cultural histories of particular tribes as well as the comparative elements of Indian relations with non-Indians.

Underclass Seminars

[208 Anarchism in America and Europe] Spring. 4 credits. Prerequisite: permission of instructor. Not offered 1986–87. Hours to be arranged: R. Polenberg. Topics include Godwin, Bakunin, and Kropotkin: anarchism and socialism; the libertarian tradition; anarchists in the Russian Revolution; Emma Goldman and Alexander Berkman; the red scare and the Sacco-Vanzetti case; the Spanish civil war; anarchism and education.

209 Political History of Indians in the United States Fall. 4 credits. R 10:10–12:05 D. H. Usner. An investigation of political organization and change among Native American societies. Discussions and assignments examine forms of tribal government, diplomacy, and warfare, as well as political relations with European colonies and the United States. Specific topics include pan-Indian confederacies, Indian policy struggles over sovereignty, and Indian strategies of autonomy and resistance.

210 The Supreme Court and Civil Liberties Fall. 4 credits. Primarily for sophomores. Enrollment limited to 15 students. Prerequisite: permission of instructor. T R 2:30–3:45 R. Polenberg. The development of free speech doctrine from the era of Holmes and Brandeis to the present, with special attention to the controversies over such issues as dissent, libel, and censorship.

[214 Seminar in American Foreign Policy] Fall. 4 credits. Open to freshmen and sophomores. Limited to 14 students; preference will be given to non—history majors. Prerequisite: permission of instructor. Not offered 1986–87. T 2:30–4:25 W. LaFeber.


222 Public Life and Literature in Tudor England Fall. 4 credits. Prerequisite: permission of instructor. M W 9:05 F. G. Marcham. A study of the chief developments in the political, governmental, and religious life of England in the sixteenth century and weekly discussions of a selection of Tudor prose, poetry, and drama.

223 Public Life and Literature in Stuart England Spring. 4 credits. Prerequisite: permission of instructor. M W 9:05 F. G. Marcham. A study of the chief developments in the political, governmental, and religious life of England in the seventeenth century and weekly discussions of a selection of Stuart prose, poetry, and drama.

225 Public Life and Literature in Nineteenth-Century Great Britain Fall. 4 credits. Prerequisite: permission of instructor. T R 9:05 F. G. Marcham. A study of British political, social, and constitutional history is paralleled by the reading of plays. Both history and literature are considered. The development of parliamentary democracy in Great Britain, the consequences for her of the two world wars, the emergence of the welfare state, the application to the economy of nationalization, and Great Britain's withdrawal from imperialism are presented. Among the writers read and discussed are Shaw, Maugham, O'Casey, Sherif, and Osborne.

226 Public Life and Literature in Twentieth-Century Great Britain Spring. 4 credits. Prerequisite: permission of instructor. T R 9:05 F. G. Marcham. A study of British political, social, and constitutional history is paralleled by the reading of plays. Both history and literature are considered. The development of parliamentary democracy in Great Britain, the consequences for her of the two world wars, the emergence of the welfare state, the application to the economy of nationalization, and Great Britain's withdrawal from imperialism are presented. Among the writers read and discussed are Shaw, Maugham, O'Casey, Sherif, and Osborne.

[227 Historical Perspectives on Modern American Sex Roles (also Women's Studies 227)] Spring. 4 credits. Each section limited to 20 students. Intended primarily for sophomores. Not offered 1986–87; next offered 1986–89. Hours to be arranged: M. B. Norton. A reading and discussion course. The class will begin by examining sex roles in the United States in the 1980s, looking at a variety of sources like popular magazines and contemporary commentaries. We will then move backwards in time in an attempt to uncover the roots of current attitudes. The students will help determine which topics the class will investigate in detail.

232 The City in History Spring. 4 credits. Limited to 12 students. R 10:10–12:05 S. Burnin. Reading and discussion of classic interpretations of the rise, role, and character of cities in ancient Greece, medieval Europe, and in the eighteenth- and twentieth-century Europe and America. Further reading on the history of a particular city of the students' own choice. Several short papers.

Comparative History

274 Foodways: A Social History of Food and Eating Spring. 4 credits. T R 2:30–3:45 S. L. Kaplan. An interdisciplinary examination of the validity of the adage "man is what he eats." Among the topics: food and nutrition; food and social structure; the politics of food control; food and modernization; taste making; and food in religion and literature. Cases will be drawn widely across space and time, from Pharaoah's Egypt to the 1960s.


[407 Death in Past Time] 4 credits. Not offered 1986–87. S. L. Kaplan. Every culture has felt an urgent need to deal with death: to disarm, rationalize, and integrate it by giving it a sense. How a culture perceives and propitiates death reveals a great deal about its social and political structure, religious and artistic values, and economic and scientific goals. The nature of death is considered using a wide variety of examples drawn from throughout history.

454 The Herodotean Moment: The Uses and Abuses of "Western Civilization" (also Government 454) Spring. 4 credits. Limited to 20 students. Prerequisite: permission of instructors. W 2:30–4:30 J. H. Weiss. The basic premise of the seminar is that the concept of "Western civilization" is a problematic one in need of critical analysis. The course will examine the historical evolution of the concept, the extent and reasons of actual and perceptual encounter with other civilizations. It will also inquire into the political uses and abuses of the concept, as well as its discursive, psychological, and anthropological dimensions.

History of Science

281–282 Science in Western Civilization Fall and spring. 3 credits each term. 281, fall; 282, spring. History 281 is not a prerequisite to 282. T R 10:10–12:05 L. P. Williams. The dominant feature of world civilization today is modern science. What is it? Where did it come from? How did it develop? Why was it uniquely a product of Western civilization, at least in its mature form? History 281–82 is a course designed to come to grips with these questions. Its purpose is twofold: to make comprehensible to both science majors and students of the humanities the structure and methods of science and to illustrate precisely how science is related to social, political, and economic thought and institutions through the centuries.

287–288 History of Biology (also Biological Sciences 201–202 and Biology and Society 287–288) Fall, 287; fall, 288; spring. 3 credits each term. Prerequisite: one year of introductory biology. 287 is not prerequisite to 288. T R 10:10–11:25 W. Provine. An examination of the history of biology, emphasizing the interaction of biology and culture. Original writings of biologists constitute the bulk of reading assignments. The fall semester covers the period from classical antiquity to 1900. The spring semester is devoted entirely to twentieth-century biology.

[380 Social History of Western Technology] Fall. 4 credits. Not offered 1986–87. M W F 1:25; disapproved J. H. Weiss. Studies in the interaction between technological changes and social changes in Western Europe and America since the eighteenth century. Readings, lectures, and debates will deal with the concept of social transformation that accompanied technological changes and with the role of technology in sociocultural and cultural expression. Course gives special attention to the British role in bringing the Industrial Revolution, America in the nineteenth century, and America during the Vietnam War.
443 History of the Agricultural Sciences Fall. 4 credits. One-time offering by visiting professor. Hours to be arranged. M. Rossiter. This seminar will survey the major themes in the development of the agricultural sciences (e.g., soil science, economic entomology, horticulture, nutrition, and plant pathology), including the role of particular individuals (such as Luther Burleigh Bailey, Henry A. Wallace, and Norman Borlaug), the rise of governmental support and institutions, and the achievements of the recent Green Revolution.

444 Historical Issues of Gender and Science Spring. 4 credits. One-time offering by visiting professor. Hours to be arranged. M. Rossiter. This course will consider (1) the history of women in science (since antiquity but chiefly in the twentieth century) and (2) the role of femininity and masculinity in science and engineering. Some acquaintance with the history of science will be helpful.

447 Seminar in the History of Biology (also Biology and Society 401 and Common Learning Course) Fall. 4 credits. T 2:30–4:30. W. Provine and staff. Title this semester: Evolution. Evolution is the most central concept in biology. This course will examine biological evolution in its historical perspective and address its immense implications for the biological sciences and for human culture. Among the issues to be discussed are the relations of biological evolution to ethics, human development, and cultural anthropology and the place of humans in nature.

448 Seminar in the History of Biology (also Biology and Society 402 and College Scholar Course) Spring. 4 credits. T 2:30–4:30. W. Provine. Title for this semester: History of the Conflict between Science and Religion. The warfare between science and religion from Galileo to the present. Eminent Cornellians from Andrew Dickson White to Frank H. T. Rhodes will be represented in the readings.

[481–482 Scientific Revolution 481, fall; 482, spring. 4 credits. Not offered 1986–87 T 2–4:30. L. P. Williams]

680 Seminar in the History of Nineteenth-Century Physical Science Fall. 4 credits. Hours to be arranged. L. P. Williams. Seminar in the historiography of science. An examination of the ways in which the history of science has been written in the recent past. The influence of various ideologies and philosophies on this history will be examined in detail. Readings include T. S. Kuhn, Popen, Poucaut, Duhem, and Cassirer.


781 Advanced Seminar in the History of Nineteenth-Century Physical Science Spring. 4 credits. Previous consent of instructor. Hours to be arranged. L. P. Williams. Topic to be arranged.

American History

101–102 Introduction to American History 101, fall; 102, spring. 3 credits each term. 101 is not a prerequisite to 102. Not open to students who have taken History 201 and 202. M.W. F 11:15. G. C. Altschuler. A survey of United States history designed to introduce students to major themes and interpretations. History 101 traces the origin and evolution of the nation through 1865. Topics include Puritanism, the American Revolution, the Constitution, Jacksonian democracy, and the Civil War. History 102 covers the period from the Civil War to the present. Topics include the Reconstruction, the Gilded Age, the world wars, the 1960s, Vietnam, and Watergate.

255 The American Dream Fall. 4 credits. M 1:25–1:5. F. Somkin. The culture of the United States is markedly different from that of the rest of the English-speaking world. What makes Americans distinct? Lacking from the beginning the blood-and-soil amalgam of other peoples, America has been primarily a set of promises: the American Dream. Key elements of the dream have been: (1) The collective dream of national innocence and mission; and (2) the individual dream of personal success; (3) the dream of material abundance; (4) the dream of social redemption or reeducation; (5) the dream of a democratic art that will embody the egalitarian spirit of mankind; and (6) the dream of equal justice under law, guaranteed in fundamental documents. The emphasis of the course will be on the ironical contrast between these visions at their most grandiose and present American realities.

275 Crime and Punishment: From the Puritans to Mickey Spillane Spring. 4 credits. M.W.F 1:25–2:15. F. Somkin. A historical investigation of how the American literary imagination has dealt with the way of the transgressor. Readings on murder, guilt, and retribution on land and sea, from the frontier to the urban jungle.

[311 The Structure of American Political History Fall. 4 credits. Not offered 1986–87; next offered 1987–88. J. H. Silbey. Examines the course of American politics from 1787 to the Civil War focusing on the nature of decision making, popular and legislative voting behavior, and the role of interest groups, political parties, and political elites in shaping our political history.]

[312 The Structure of American Political History Spring. 4 credits. Not offered 1986–87; next offered 1987–88. M.W.F 10:10, plus optional section. J. H. Silbey. Examines the course of American politics from 1865 to the present, focusing on the nature of decision making, popular and legislative voting behavior, and the role of interest groups, political parties, and political elites in shaping our political history.]


321 The Origins of American Civilization Spring. 4 credits. M.W.F 1:25. M. Kammen. The colonial genesis of American culture and society, with emphasis upon the emergence of distinctive institutions, attitudes, and social patterns. Topics include race relations, religion, politics, movements of protest, and cultural developments. Open to qualified freshmen.

323–324 Native American History 323, fall; 324, spring. 4 credits each term. M.W.F 2:20. D. H. Usner. A survey of North American Indians from the beginning of European contact to the present. Cultural, political, and economic changes experienced by particular societies will be covered. Emphasis given to general themes of Indian-white relations, comparative tribal histories, and the role of Native Americans in the overall history of the United States.

[325 Age of the American Revolution, 1763–1815 Fall. 4 credits. Not offered 1986–87; next offered 1988–89. T.R 10:10–11:40. M. B. Norton. An examination of the process by which the thirteen English colonies became an independent and united nation, with emphasis on political thought and practice, social relations, economic aspects, and cultural development. Attention will be paid to the impact of the American Revolution on women, Blacks, and Indians as well as on white males.]

[326 Women in the American Society, Past and Present Spring. 4 credits. Not offered 1986–87; next offered 1987–88. M.W.F 10:10; disc, F. 10:10 or 12:20. M. B. Norton. A survey of women's experiences in America from the seventeenth century to the present. Among the topics to be discussed are women's familial roles, the changing nature of household work, the women's rights movement, employment options outside the home, racial and ethnic differences in women's experiences, and contemporary feminism.]


331 The American Civil War and Reconstruction Spring. 4 credits. M.W.F 10:10. J. H. Silbey. An analysis of the factors leading up to the breakup of the Union, the impact of the war in North and South, and the problems of restoration and reconstruction of the seceded states.

332–333 The Urbanization of American Society 332, fall; 333, spring. 4 credits each term. 332 is not prerequisite to 333. M.W.F 11:15. S. Blumin. An examination of the process of urbanization in America from the earliest European settlements to the present. Emphasis will be placed on the development of urban forms, institutions, classes, and life-styles and on the changing impact of cities upon nonurban areas and the nation as a whole. The first term covers the period up to the emergence of the industrial city (ca. 1860); the second term covers the period from 1860 to the present.

[336–337 American Social History 336, fall; 337, spring. 4 credits each term. History 336 is not a prerequisite to 337. Not offered 1986–87. M.W.F 10:10. S. Blumin. A history of American society, with emphasis on the transforming effects of such phenomena as industrialization, urbanization, immigration, national
expansion, and institutionalization on the social life of anonymous Americans. The first semester will cover the colonial and Jacksonian eras, with emphasis on the latter; the second semester will focus upon the industrial-urban transformation of the late nineteenth and twentieth centuries.

340 Recent American History, 1917 to 1945 Fall. 4 credits.
T R 2:20; disc to be arranged. R. Polenberg. Topics include civil liberties and dissent in World War I; individualism and conformity in the 1920s; radicalism and reform in the New Deal; class, race, and ethnicity; Franklin Roosevelt and World War II; the Holocaust and the atomic age.

341 Recent American History, 1945 to the Present Spring. 4 credits.
T R 2:20; disc to be arranged. R. Polenberg. Topics include the cold war and civil liberties; the Supreme Court and civil rights; Kennedy, Johnson, and social reform; the Vietnam War; the Carter and Reagan presidencies; class, race, and ethnicity in modern America.

M W F 1:15, F. Somkin. Ideas, thinkers, feeling, and expression from the seventeenth century to the Civil War. Topics include Puritanism, the Enlightenment, Jeffersonian and Jacksonian democracy, antebellum reform movements, the attack on natural rights, and the effect of Darwinian evolution on traditional American ideas.

345 The Modernization of the American Mind Fall. 4 credits.
M W F 11:15; disc to be arranged. R. L. Moore. American thought and culture from 1890 to the present. Emphasizes the intellectual impact of major political and economic events and the adaptation of social ideas and values to new conditions.

346 Religion in American History Spring. 4 credits.
M W 11:15; disc to be arranged. R. L. Moore. Examination of the interaction of the ideas and behavior of American religious groups with American culture and society. The course covers the nineteenth and early twentieth century.


414 Motivations of American Foreign Policy Fall. 4 credits. Prerequisites: History 314 and permission of instructor.
R 2:30–4:25; W. LaFeber.

415 The United States and Russia 1780 to 1914 Fall. 4 credits. Enrollment limited to 16 students. Primarily for juniors and seniors. Prerequisite: permission of instructor. Next offered 1986–89. T R 2:30–4:15; S. LaFeber. The course will analyze diplomatic relations between the United States and Russia between 1780 and 1914. Special attention will be given to the causes of the friendship of the early decades and why it changed to animosity. The domestic origins of the foreign policies of both nations will be stressed. Extensive individual research projects will be assigned.

418 Undergraduate Seminar in the History of the American South Spring. 4 credits. Prerequisite: permission of instructor. J. H. Silbey.

419 Seminar in American Social History Fall. 4 credits. Prerequisites: permission of instructor. R 2:30–4:30; S. Blumin. Topic for 1986: class, culture, and social experience in industrializing America.

421 Constitutionalism in American Culture Fall. 4 credits.
T 2:30–4:30; M. Kammen. This seminar for juniors and seniors will explore various trends, characteristics, episodes, and changes in American constitutionalism from the Revolutionary era to the present. Weekly discussions and a research paper.


429 Undergraduate Seminar in Indians of Eastern North America Fall. 4 credits. Not offered 1986–87. R 2:30–4:25. D. H. Usner. A seminar examining the history of Native Americans in the eastern woodlands from colonial times to the present. The cultural and economic participation of Indians in the evolution of frontier societies as well as the impact of European colonialism on tribal societies will be examined. Major topics include fur-trade networks, political relations, removal, and the persistence of Indian communities within eastern states.

430 Law and Authority in American Life Spring. 4 credits. Enrollment limited. Prerequisite: permission of instructor. T 2:30–5; F. Somkin. A seminar covering (1) an overview of American law from colonial times to the twentieth century, and (2) an examination of selected topics such as vigilant justice, the legal enforcement of morality, the insanity defense to homicide, the present authority of the criminal justice system, and the dissolution of social authority generally.

440 Undergraduate Seminar in Recent American History Spring. 4 credits. Prerequisite: permission of instructor.

613–614 Seminar on American Diplomatic History 4 credits each term.
613 Fall; 614, spring. 4 credits each term. 613 not offered 1986–87. W. LaFeber.


619 Seminar in American Social History Fall. 4 credits. R 2:30–4:30; S. Blumin.

621 Social Memory and the Problem of Tradition in American Culture Fall. 4 credits. Intended for graduate students and advanced undergraduates. Prerequisite: permission of instructor.
R 2:30–4:30; M. Kammen. Every society has traditions and myths concerning its evolution and identity. The focus of this seminar will be to examine the role of tradition and memory in American culture in comparative perspective. There will be contextual readings on nationalism and mythology in general. Comparisons will be made with European and Asian cultures.


626 Graduate Seminar in the History of American Women Fall. 4 credits. Not offered 1986–87. R 2:30–4:30. M. B. Norton. A reading and research seminar intended primarily for graduate students. Major works in American women's history will be carefully scrutinized, and each student will prepare a lengthy research paper.


710 Colloquium in American History Spring. 4 credits. Required of all first-year American history graduate students. M 2:30–4:30; J. H. Silbey. Examination of the major themes, epochs, and interpretations of American history.

Latin American History

295 Colonial Latin America Fall. 4 credits.
M W F 10:10. T. H. Holloway. Survey of Latin America from the rise of pre-Columbian civilizations through the European conquest, the establishment of the Spanish and Portuguese colonial societies, imperial rivalries in the New World, the background of the independence movements, and the achievement of political independence.

296 Latin America in the Modern Age Spring. 4 credits.
M W 10:10 plus disc to be arranged. T. H. Holloway. Survey of the Latin American nations from independence to the present. Major themes include the persistence of neocolonial economic and social institutions, the development of nationalist and populist politics, revolutionary movements of the twentieth century, and United States–Latin American relations.

347 Agrarian Societies in Latin American History Not offered 1986–87. T. H. Holloway. The development of rural patterns of wealth, status, and power, focusing on the role of country people in the larger society. Topics include disruption of the conquest, evolution from encomienda to hacienda, rise of plantation agriculture and export enclaves, decline of Indian communities, peasant protest, and land reform and development programs of the recent past.

348 Contemporary Brazil Spring. 4 credits. Not offered 1986–87. T R 1:25. T. H. Holloway. A study of the style of development in economy, policy, and society followed by contemporary Brazil and an analysis of the contradictions that led to the military coup of 1964 and its aftermath. Some comparisons are made with other Latin American countries. Readings in English.

449 Undergraduate Seminar in Latin American History Fall. 4 credits. Prerequisite: permission of instructor.
M 2:30–4:30; T. H. Holloway. Topic for 1986: Central America in historical perspective.

How is the "war story" told in postwar Japan? The course will examine persistent manifestations of the war memory in contemporary Japanese cultural life, with emphasis on ways in which the story of World War II has been retold, reinterpreted, and given new symbolic and factual significance in light of changing historical circumstances. Class discussion will focus on the interpretation and reinterpretation of history and the role of propaganda, fiction, and poetry.


[492 Undergraduate Seminar in Medieval Chinese History Spring. 4 credits. Prerequisite: History 393 or permission of instructor. Not offered 1986–87. R 2:30–4:30. S. Cochran. Conceptions of self and relationships between the individual and society in China from the seventh century to the present.]

[499 Art and Society in Modern China Spring. 4 credits. Not offered 1986–87. W 2:30–4:30. S. Cochran, M. Young. The relationship between the visual arts and social change in China from the seventeenth century to the present. The value of art as a reflection of social reality and as an agent for social reform is analyzed on the basis of a variety of visual materials, which range from calligraphy, paintings, and porcelains of the seventeenth and eighteenth centuries to woodblock prints, photographs, and films of the nineteenth and twentieth centuries.]

[691 Chinese Historiography and Source Materials Spring. 4 credits. Prerequisite: permission of instructor. Not offered 1986–87. Hours to be arranged. C. A. Peterson.]

[693–694 Problems in Modern Chinese History 693, fall; 694, spring. 4 credits each term. Prerequisite: permission of instructor. Hours to be arranged. S. Cochran.]

[695 Early Southeast Asia: Graduate Proseminar Fall. 4 credits. Hours to be arranged. D. K. Wyatt. Introduction to the history of Southeast Asia for graduate students. Students will be expected to attend the lectures and complete the readings for History 395, and they will meet separately as a group to further explore selected topics.]

[696 Modern Southeast Asia: Graduate Proseminar Spring. 4 credits. Hours to be arranged. T. Shirai. Introduction to the modern history of Southeast Asia for graduate students. Students will be expected to attend the lectures and complete the readings for History 396, and they will meet separately as a group to further explore selected topics.]

[791–792 Seminar in Medieval Chinese History 791, fall; 792, spring. 4 credits each term. Prerequisite: permission of instructor. Not offered 1986–87. Hours to be arranged. C. A. Peterson.]

[793–794 Seminar in Modern Chinese History 793, fall; 794, spring. 4 credits each term. Prerequisite: permission of instructor. Hours to be arranged. S. Cochran.]

[795 Seminar in Southeast Asian History Fall. 4 credits. Not offered 1986–87. Hours to be arranged. T. Shirai.]

[796 Seminar in Southeast Asian History Spring. 4 credits. Hours to be arranged. D. K. Wyatt.]

[797–798 Seminar in Japanese Thought 797, fall; 798, spring. 4 credits each term. Prerequisite: permission of instructor. Hours to be arranged. J. V. Koschmann.]

[**Asian History**]

[190 Introduction to Asian Civilizations Spring. 4 credits. W 11:15 plus disc, M 11:15, 12:20, or 2:30. J. V. Koschmann, D. K. Wyatt. An introduction to the distinctive cultures of China, India, and Japan that features an intensive examination of selected topics and periods of particular significance in the history of each.]

[191 Introduction to Asian Civilizations in the Modern Period Fall. 4 credits. W 11:15 plus disc, M 11:15, 1:25, or 2:30. J. V. Koschmann, D. K. Wyatt. The history of Asian civilizations in modern times is introduced, focusing on the relationships between key figures and societies. English translations of autobiographies, novels, short stories, diaries, and other documents written by Asians are used to assess the perspectives, social priorities, and historical significance of intellectual and political leaders.

[393 History of China up to Modern Times Fall. 4 credits. Not offered 1985–87. T R 10:10 plus an additional hour, M 11:15 or 1:25. C. A. Peterson. A survey of the principal developments in the history of China from the earliest times to the eighteenth century that also undertakes a topical introduction to Chinese culture and civilization, in part by the use of visual materials.]

[394 History of China in Modern Times Spring. 4 credits. T R 10:10 plus one hour to be arranged. S. Cochran. A survey that concentrates on the rise of the last imperial dynasty in the seventeenth and eighteenth centuries, the upheavals resulting from domestic rebellions and foreign imperialism in the nineteenth century, and the twentieth-century efforts to achieve social mobilization and political unity.]

[395 Southeast Asia to the Eighteenth Century Fall. 4 credits. T R 11:15 plus one hour to be arranged. D. K. Wyatt. A survey of the earlier history of Southeast Asia, concentrating particularly upon regional movements of economic, social, cultural, and political change and utilizing, to the extent possible, readings in primary sources.

[396 Southeast Asian History from the Eighteenth Century Spring. 4 credits. T R 11:15 plus one hour to be arranged. T. Shirai. A survey of the modern history of Southeast Asia, with special attention to the formation of modern states (colonial as well as national), changing economic and social structure, and consciousness. Primary texts will be read in translation whenever feasible.

[397 State, Society, and Culture in Japan to 1750 Fall. 4 credits. T R 1:25, plus disc, F 1:25 or 2:30. J. V. Koschmann. A survey of Japanese history from its beginnings to the early modern period. Attempts to draw relationships among such factors as political and institutional change, social structure, aesthetic sensibility, literary form, and religious consciousness. Primary texts in translation will be read whenever feasible.

[398 State, Society, and Culture in Modern Japan Spring. 4 credits. T R 1:25, plus disc, F 1:25 or 2:30. J. V. Koschmann. A survey of Japan from the mid-eighteenth century to the present, with special attention to changing configurations of institutional structure, knowledge, action, and conceptions of history. Japanese works in translation will be read and discussed in addition to secondary sources.

[399 War as Myth and History in Postwar Japan (also Asian Studies 381) Fall. 4 credits. Not offered 1986–87. T R 1:25. B. deBary, J. V. Koschmann.]

[725 Ancient Egypt Spring. 4 credits. Open to freshmen. M W 11:15; disc, T 12:20 or 2:30. B. Strauss. A survey of the earliest periods to the end of the educational period in the fourth millennium B.C. The course focuses on the Giza pyramid, its causal and cultural greatness, its defects, and its legacy. The Heroic Age, the city-state, ancient democracy, and the intellectual ferment of the Greek Enlightenment are the main topics of study. Readings in translation include Herodotus, Aristophanes, Sophocles, Herodotus, Thucydides, Plato, Aristotle, and from the evidence of ancient inscriptions, coins, art, and architecture.]

[268 A History of Rome: from Republic to Holy City Spring. 4 credits. Open to freshmen. M W 11:15, T, 12:20 or 2:30. B. Strauss. A survey of Rome from the founding of the Republic to the end of the Western Empire. The focus is on the Roman conquest of the Mediterranean world and on the cultural reconquest of Rome by the vanquished. Roman politics, peasant society, imperialism, and propaganda are the main topics of the first half; the government of the Caesars, society during the Roman peace, and the fertile interaction of Romans, Jews, and Greeks that produced Christianity are the main topics of the second. Readings in translation include Cicero, Polybius, Josephus, Tacitus, Plutarch, and Saint Augustine.]

[373 The Greek City from Alexander to Augustus 4 credits. Not offered 1985–86. M W 11:15; disc to be arranged. B. Strauss. A two-fold search for Alexander the conqueror and the man and the city-state of the world he created, in which the Greek city was planted as far as Egypt and India. These new cities saw a change from republicanism to monarchy, from community values to individualism, from particularism to ecumenicalism; embraced the new philosophies of Stoicism and Epicureanism; and were the hothouses of a new religion: Christianity. Readings in translation include Arrian, Plutarch, Aristophanes, Menander, Theocritus, Polybius, the Book of Maccabees, Epicurus, and Lucretius.]

[452 The Tragedy of Classical Athens, 462–404 B.C. Fall. 4 credits. Prerequisite: History 265 or 373, or permission of instructor. Not offered 1986–87. M 2:30–4:30. B. Strauss. The nature of Athenian democracy, society, and culture in Athens' "golden age." The course will examine the influence of Athenian political life on the great tragic poets of the age and the influence of tragedy on the Athenians' conception of their character and history. Readings from Herodotus, Thucydides, Aristophanes, Sophocles, Euripides, Aristophanes, Plato, Aristotle, and Plutarch.]

[453 Crisis of the Greek City-State, 415–336 B.C. Spring. 4 credits. Enrollment limited. Prerequisite: History 265 or 373, or permission of instructor. Not offered 1986–87. M 2:30–4:30. B. Strauss.]}
The fortunes of the city-state and citizen in an age of uncertainty. The focus is on Athens, with some attention paid to the wider Greek world. Topics include the nature of Athenian politics, Athenian society, cultural change, the war between the city-states, crisis as a historical concept, and anthropology and ancient Greece. Readings in translation include Thucydides, Sophocles, Euripides, Aristotle, Arrian, Xenophon.

[361] The Culture of the Early Renaissance (also Comparative Literature 361 and History of Art 350) Fall. 4 credits. Not offered 1986–87; next offered 1987–88. T R 1:25; disc to be arranged. C. Lazaro, J. Najemy, with some lectures by W. Kennedy, E. Morris. Renaissance culture is introduced through six major figures: Petrarch, Machiavelli, Leonardo, Erasmus, and Rabelais. Each figure will be the focal point for the critical examination of problematic issues in the areas of humanism, religious and political thought, literature, art, and architecture. In the discussion sections problems of interpretation will be approached through the analysis of primary source readings and works of art.


[366] Medieval Culture, 1100–1300 Spring. 4 credits. Prerequisite: History 264 or permission of instructor. Not offered 1986–87; next offered 1987–88. T R 2:30–3:45. J. J. John. The origin and development of the universities will be studied as background for a consideration of the scholastic mentality and its influence on the art, literature, philosophy, science, script, and theology of the period. Readings from Abelard, Hugh of St. Victor, Bonaventure, Thomas Aquinas, Dante, etc.

367 Church and State during the Middle Ages Fall. 4 credits. Prerequisite: History 263 or permission of instructor. T R 2:30–3:45. J. J. John. The development of the universities and the growth of government in the Middle Ages are considered. Particular attention is given to the growth of medieval constitutionalism.

368 Francis of Assisi and the Franciscans Fall. 4 credits. Prerequisite: History 264 or knowledge of medieval background, and permission of instructor. W 2:30–4:30. B. Tierney A seminar with lectures, class papers, and class discussions. The course will begin with detailed study of the early lives of Francis in translation, then consider the impact of the Franciscans on the medieval church and vice versa.

369 The History of Florence in the Time of the Republic, 1250–1330 Spring. 4 credits. T R 12:20–1:35. J. Najemy. Florentine political history from the communal period through the age of Dante, the rise and decline of the guild republic, the age of civic humanism, and the rise of the Medici to the time of Machiavelli. Economic structures and social classes, corporate politics, family history, and political and historical ideas are considered in the context of the emergence and transformation of republican government.

[371] History of England under the Tudors and Stuarts Spring. 4 credits. Prerequisite: permission of instructor. Not offered 1986–87. T R 2:30–3:40. C. Holmes. An examination of the relation between the intellectual developments of the period and political, social, and religious change. Topics for discussion will include political thought, religion, operation, witchcraft, and the role of women and the family.

374 War, Trade, and Empire, 1500–1815 Fall. 4 credits. M W 2:30–4:30. D. A. Baugh. Maritime enterprise, imperial policy, and naval power in the age of expansion. The rise and decline of the Portuguese and Spanish empires are considered, but the emphasis is on English, French, and Dutch rivalry in the Atlantic and Caribbean.

461 The Greco-Roman World in Late Antiquity and Early Byzantine Times, A.D. 306–565 Spring. 4 credits. Prerequisite: History 263, 265, or 268, or permission of instructor. M W 2:30–4:30. B. Strauss. A seminar in the cultural, socioeconomic, and political history of the period. Topics include the interaction of paganism and Christianity; art form, civic life, and the individual; the family, Julian and Justinius; and the concept of decline and fall.

468 Undergraduate Seminar in Renaissance History Fall. 4 credits. 2:30–4:30. J. Najemy.


[485] The Transformation of Feudal Society 4 credits. Not offered 1986–87. C. Holmes. The seminar will examine the ideas of a number of scholars who have suggested that England experienced a major shift in the nature of social organization and relations in the sixteenth century. Theories about feudal society and its collapse will be tested against contemporary legal and literary sources concerning the political, social, and religious experience of the English people in the Middle Ages.

[489] Seminar in Religion and Society in Early Modern Europe Fall. 4 credits. Not offered 1986–87. Hours to be arranged. R. Hsia. A thematic introduction to the recent historiography on the social history of religion in Western Europe between the fifteenth and the eighteenth centuries. Selected readings in French and German.


[659] Seminar in Society and Religion in Early Modern Europe Fall. 4 credits. Not offered 1986–87. Hours to be arranged. R. Hsia. A seminar in the cultural, socioeconomic, and political history of the period. Topics include the interaction of paganism and Christianity; art form, civic life, and the individual; the family, Julian and Justinius; and the concept of decline and fall.


[354] Twentieth-Century European Intellectual History
T R 2:20–1:35. D. LaCapra.
This course examines significant currents in twentieth-
century thought in France, Germany, and England.
Topics include the varieties of existentialism, the
development of the social sciences, psychoanalysis
and post-Freudian psychology, the modern novel,
structuralism, and postmodernism. Readings include
Weber, Freud, Heidegger, Sartre, Camus, Mann, Woolf,
Foucault, and Derrida.

[355] The Old Regime: France in the Seventeenth
and Eighteenth Centuries 4 credits
A systematic examination of the social structure,
economic life, political organization, and collective
mentalities of a society that eclipsed all others in its
time and then, brutally and irreversibly, began to age.
France, in European perspective, from the wars of
religion through the age of Voltaire.

[356] The Era of the French Revolution and
A study of the failure of the traditional system, its
dismantling and replacement in France, and the
international consequences. Focus will be on the
meaning of the revolutionary experience, the tension
between the desire to destroy and to create, and the
implications of the Revolution for the modern world.

[357] Survey of German History, 1848–1890
Fall. 4 credits. Not offered 1986–87.
An examination of the social, political, intellectual,
and diplomatic history of the German states from the
devastation of the Thirty Years' War, through absolutism,
the bourgeois revolutions of 1848, and the struggle
for unification, to the beginning of the modern industrial
state.

[358] Survey of German History, 1890 to the
Present Spring. 4 credits. Open to freshmen.
M W 9:05; disc. W 10:10, 11:15, or 1:25. I. V. Hull.
The "German problem" is examined. Major topics
include tensions caused by rapid industrialization
presided over by a preindustrial, political elite; origins
of World War I; growth of anti-Semitism; social
dislocations of World War I; failures of the socialist
revolution of 1918–19; unstable Weimar democracy and
the rise of Nazism; the Nazi state; World War II; and
the two Germanies.

362 Russian History to 1800 Fall. 4 credits. Open
to freshmen.
The origin and development of the fundamental social,
political, economic, and cultural institutions that have
determined the nature of contemporary Soviet society.

[359] Russian History since 1800 Spring or
summer. 4 credits. Open to freshmen. Not offered
Nineteenth- and twentieth-century Russia, with
emphasis on the social and political evolution of
Russia; its path from the preindustrial to the modern
world; and the consequences of the Russian revolution.

[372] Social and Cultural History of Contemporary
Europe Spring. 4 credits. Not offered 1986–87;
M W 1:25; disc to be arranged. J. H. Weiss.
The transformation of European society and culture in the
era of capitalism, including the cultural and political
consequences of modernization as an interpretive framework for
social change. Topics will include changes in the structure
and values of rural and urban communities; shifts in
education, class structure, family life, and the images
of work and leisure; and aspects of popular culture.

[379] War and Society: The Origins of the First
World War, 1870–1919 (also Government 388)
M W 11:15 plus disc. F 11: I. V. Hull, W. Pintner,
R. Rosemarce.
The First World War destroyed the European world: its
hegemony in international politics, its international
balance, its social and economic structures, its
intellectual certainties. This course examines the long-
term causes and the immediate causes of this cataclysm,
with special focus on the relationship between the various
countries' domestic politics and their foreign policies,
the changing balance of power, economic rivalries,
imperialism, the growth of extreme nationalism, and the
arms race. It ends by considering how the war was so
long and destructive and why, afterwards, no one could
put the pieces back together again.

383–384 Europe in the Twentieth Century Spring
Fall; 384, spring. 4 credits each term. History 383 is not
a prerequisite to 384.
M W 1:25, plus disc to be arranged. J. H. Weiss.
An investigation of the major developments in European
history since 1900. Emphasis upon the development
of democratic political systems and their alternatives.
383 topics include the reorientation of liberalism and
decentralism, the failure of old-fashioned war and depression,
the dynamics of fascism, the European response to the economic
and ideological influence of America and the Soviet
Union, and the interaction between politics and social
structure. 384 topics include the origins and course of
the cold war in Europe, the emergence of welfare states,
the movement for European unity, ethnic and regional
movements, the crises of 1988, the end of dictatorship
in Spain and the socialist experiment in France, and
the politics of the arms race.

[405] Population and History 4 credits. Seminar
R 2:30–4:30. S. L. Kaplan.
An examination of the impact of the methodology
and findings of demography on historical scholarship
and the implications of historical research for the study
of population. Focus will be on the relationship
between population and family life and social, economic
growth, political stability, collective mentality, etc.
Readings in European and American history from the
Black Plague through the Industrial Revolution.

409 Seminar on Work in Europe and America
Fall. 4 credits.
W 2–4. S. L. Kaplan.
A comparative study of the meaning of work in different
societies from premodern times to the present.
Emphasis will be on the "representations" of work of the actors
who worked, and the consequences for various
critical reasons did not work. The seminar will
examine not only ideology but also the organization,
practice, and physical place of work. It will explore
theory as well as "cases," and draw on anthropological
and sociological as well as historical materials.

[450] Seminar in European Imperialism Spring
4 credits. Open to upper-level undergraduates.
Prerequisite: permission of instructor. Not offered
Focuses on the various theories of imperialism with
particular reference to the domestic causes, uses, and
repercussions of late-nineteenth-century imperialism
in Germany, France, and Great Britain.

[451] Lord and Peasant in Europe: A Seminar in
Social History 4 credits. Prerequisite: permission of
S. L. Kaplan.

[457] Seminar in European Fascism Spring
4 credits. Prerequisite: permission of instructor. Not
An attempt to define and understand the social,
political, and intellectual origins, mechanisms, and
goals of European fascist movements of the 1920s and 1930s by detailed study of German National Socialism, Italian Fascism, and the Action Française.

Perspectives on the landed aristocracy's continuing domination of politics. Topics include the political system, political and social thought, aristocratic lifestyle, religion, crime and criminal justice, the Old Poor Law, land and commerce, the role of London, and relations with Scotland, Ireland, and America. Readings are drawn from both modern historians and eighteenth-century authors.

[467] Seminar in Modern European Political History
Spring. 4 credits. Prerequisite: History 383 or permission of instructor. Not offered 1986–87.

[471] Russian Social History
Spring. 4 credits. Prerequisite: one semester of Russian history or permission of instructor. Not offered 1986–87.
A seminar devoted to an examination of the diverse social groups that comprise imperial Russia and Soviet society. Includes systematic comparison with other countries.

474 Topics in Modern European Intellectual History
Spring. 4 credits. Prerequisite: permission of instructor.
Topic for 1986–87: history, politics, and the novel. The seminar will treat both theoretical texts and novels, and it will explore the question of a historical and critical reading of a novel.

[476] Documenting the Depression: Film, Literature, and Memory
4 credits. Prerequisite: permission of instructor. Not offered 1986–87.
Hours to be arranged: one screening session and one disc per week. J. H. Weiss.
Social and intellectual history of Britain and America in the 1930s, with special attention to modes of documentary expression and to subjects lending themselves to treatment by film or oral history: work, popular culture, changes in urban and rural communities, family life, and poverty and unemployment.

477 Seminar on the Politics of the Enlightenment
Spring. 4 credits.
W 2:–4. S. L. Kaplan.
An inquiry into the historical origins of European (especially French) political, social, and economic thought, beginning in the 1680s, at the zenith of Louis XIV's absolutism, and culminating in the French Revolution a century later. Emphasis is on the relationship of criticism and theory to actual social, economic, religious, and political conditions. An effort is made to assess the impact of enlightened thought on the eighteenth-century world and to weigh its implications for modern political discourse. Readings in translation from such authors as Bayle, Montesquieu, Voltaire, Rousseau, Diderot, etc., as well as from modern scholarly and polemical literature.

[478] Seminar in Eighteenth-Century French Social History
S. L. Kaplan.

480 Twentieth Century Britain
Fall. 4 credits.
Seminar topics include Ireland, the 1930s, the world wars and their impact, the decline of liberalism, the roots of Britain's economic problems, the decline of empire, the condition of the political parties, and the character of English society.

481 The Origins of Modern Sciences, 1500–1700
Fall.
P. R. Dear.
The outlook and practices of modern science are today a central part of Western culture. This course examines their creation in the Europe of the sixteenth and seventeenth centuries, when far-reaching changes in society promoted a new, more active way of confronting nature that aimed at control as well as understanding. Course readings will include a considerable proportion of primary source material to show how the finite, organic universe of the Middle Ages became the infinite, mechanical world of Isaac Newton. Lectures and readings will aim at promoting both understanding of the historical issues and critical awareness of the scientific worldview as an aspect of culture.

[483] Seminar in Modern European Social History
Fall. 4 credits. Not offered 1986–87.
J. H. Weiss.

486 The Formation of the Russian Intelligentsia, 1700–1850
Fall. 4 credits. One-time offering by visiting professor. Intended primarily for seniors and graduate students in the field of history. Prerequisites: one semester of Russian history or permission of instructor.
The radical/revolutionary intelligentsia became a major feature of Russian life in the nineteenth century, and from it emerged many of the leaders of the October Revolution of 1917. Originating in the new secular culture of eighteenth-century Russia, the intelligentsia had become by 1850 a distinct, recognizable, and self-aware social group. This course will trace the evolution of that group and developments that accompanied it. It will examine the emergence within that context of new modes of thought and expression and of social criticism and dissent from the established order, paying attention also to supporters of that order. Consideration will be given to representative samples in translation of the writings of those involved.

[485] Seminar in Eighteenth-Century British History
D. A. Baugh.

[556] Seminar in Nineteenth-Century British History
D. A. Baugh.

[671] Seminar in the French Revolution
S. L. Kaplan.

672 Seminar in European Intellectual History
Fall. 4 credits. Hours to be arranged. D. LaCapra.

673 Seminar in European Intellectual History
Spring. 4 credits. Hours to be arranged. D. LaCapra.

677 Seminar in Russian History
Fall. 4 credits. Hours to be arranged. R. P. Bartlett.

678 Seminar in Modern European Social History
Spring. 4 credits. Hours to be arranged. J. H. Weiss.
Research seminar. Topic: origins of social and professional hierarchies.

[679] Seminar in European History
S. L. Kaplan.

Honors and Research Courses

301 Supervised Reading
Fall or spring. 2 credits. Open only to upperclass students. Prerequisite: permission of instructor.

302 Supervised Research
Fall or spring. 3 or 4 credits. Open only to upperclass students. Prerequisite: permission of instructor.

400 Honors Proseminar
Fall or spring. 4 credits. Limited to 15 students. For prospective honors candidates in history. Permission of instructor required.
Fall: R 2:30–4:30. F. Somkin.
An introduction to historical writing and modes of research, emphasizing the possibilities and limitations of historical inquiry.

An examination of major approaches to historical inquiry and analysis. Masterworks of historical writing (traditional as well as recent) will be discussed. There will be two short essays and a longer paper (a study of the work of one major historian). The readings will be drawn from all time periods and diverse cultures.

401 Honors Research
Fall or spring. 4 credits. Prerequisites: History 400 and permission of instructor.

402 Honors Thesis
Fall or spring. 4 credits. Prerequisites: History 400 and permission of instructor.

703–704 Supervised Reading
703, fall; 704, spring. 4 credits each term. Limited to graduate students. Prerequisite: permission of instructor.

709 Introduction to the Graduate Study of History
Fall. 4 credits. Required of all first-year graduate students.
T 5–5 or 4–6. C. Holmes, R. L. Moore.
The course is designed to introduce entering graduate students to crucial issues and problems in historiography that cut across various areas of specialization.

Society for the Humanities Seminars of Interest to History Students

381, fall; 382, spring. 4 credits each term.
R 2:30–4:30. F. Ahl, D. Wyatt.

Literature, Science, and Ideology: The Crisis in English Thought, 1660–1750 (Society for the Humanities 421)
Fall. 4 credits.
M 12–30. R. Markley

History of Art


The visual arts—painting, sculpture, and architecture—are a principal mode of human expression. Art historians investigate works of art to understand them in their artistic, historical, and cultural contexts. Courses offered by the department cover the mainstream of Western art (classical, medieval, Renaissance, baroque, and nineteenth and twentieth century) and non-Western art, including that of East and Southeast Asia. Art history is an integral part of interdisciplinary programs such as the Archaeology Program, the China-Japan Program, Medieval Studies, and the Southeast Asia Program.

Course offerings vary in scope from introductory courses designed to acquaint the student with the ways of seeing, discussing, and writing about works of art to advanced seminars that concentrate on more specialized topics. The resources of the Herbert F. Johnson Museum of Art frequently serve as the focus for discussion sections and research assignments.
The Major

Students who wish to major in the history of art should complete two courses in the Department of History of Art by the end of their sophomore year. These courses should be completed with a grade of C or better. They are prerequisites for admission to the major but may not be counted toward fulfillment of the major requirements. In their junior and senior years, majors work closely with their advisers to determine acceptable programs in the major field. The program should include at least 30 credits in history of art courses (24 of which must be at the 300 level or above) and minimum of two additional courses in this department or in a related area approved by the major adviser. Courses at the 200 level or above taken in the freshman or sophomore years may be counted toward the major provided that the courses are in addition to those taken as prerequisites to the major. Majors are encouraged to take studio courses offered by the Department of Art, but these are considered to be electives and do not fulfill major requirements.

Honor's. In order to become a candidate for the degree of Bachelor of Arts with honors in the history of art, a student must have a cumulative average of B for all courses taken in the department. Admission into the program requires application to the department chairperson during the second term of the junior year; the application must include a summary of the proposed project, an endorsement by a faculty sponsor, and a copy of the student's transcript. In the senior year, the honors candidate will include among the regular requirements History of Art 493 and 494, which entail the preparation of a senior thesis. This program may not be condensed into one semester.

Freshman Seminars

The history of art courses listed below are offered in the Freshman Seminar Program and as freshman electives but may not be used to satisfy the distribution requirement.

103 Freshman Seminar in Visual Analysis Fall or spring 3 credits. Not open to students who have taken History of Art 101.

111 Ancient Art and Archaeology Fall. 3 credits.

120 Introduction to Art History: The Renaissance Fall. 3 credits. Not offered 1986–87.

121 Introduction to Art History: Minoan-Mycenaean Art and Archaeology (also Classics 220) Spring. 3 credits. Not offered 1986–87.

122 Art of the Roman Empire (also Classics 350) Fall. 3 credits. Not offered 1986–87.

123 Introduction to Art History: Monuments of Medieval Art Spring. 3 credits. Not offered 1986–87.

124 Architecture in the Greek and Roman World (also Classics 323) Fall. 4 credits. Not offered 1986–87.

125 The Archaeology of Cyprus (also Classics 320) Fall. 4 credits. Not offered 1986–87.

126 Art and Archaeology of Archaic Greece (also Classics 325) Spring. 4 credits. Not offered 1986–87.

127 Greek and Roman Coins (also Classics 327) Fall, 4 credits. Not offered 1986–87.

128 Greeks and Their Eastern Neighbors (also Classics 328) Fall. 4 credits. Not offered 1986–87.

130 The Archaeology of Ancient Greece (also Classics 230) 4 credits. Not offered 1986–87.

131 The Archaeology of Cyprus (also Classics 321) 4 credits. Not offered 1986–87.

132 Art of the Roman Empire (also Classics 350) Fall. 4 credits. Not offered 1986–87.

133 Painting in the Greek and Roman World (also Classics 324) 4 credits. Not offered 1986–87.

134 Architecture in the Greek and Roman World (also Classics 324) 4 credits. Not offered 1986–87.

135 Greek Vase Painting (also Classics 325) 4 credits. Not offered 1986–87.


137 Greek and Roman Coins (also Classics 327) 4 credits. Not offered 1986–87.

138 Greeks and Their Eastern Neighbors (also Classics 328) Fall. 4 credits. Not offered 1986–87.


140 History of Art 157
[329 Greek Sculpture (also Classics 329) 4 credits. Not offered 1986–87. A. Ramage.]


[332 Architecture in the Middle Ages (also Architecture 382) 4 credits. Not offered 1986–87. R. G. Calkins.]


[335 Gothic Art 4 credits. Not offered 1986–87.]


[337 The Medieval Illuminated Book Spring 4 credits. M W F 12:20. R. Calkins. A study of selected major examples of medieval illuminated manuscripts from A.D. 300 and 1500. Facsimiles of major manuscripts such as the Lindisfarne Gospels, the Book of Kells, and the Hours of Mary of Burgundy will be examined.]

[341 Flemish Painting 4 credits. Not offered 1986–87.]


[343 Italian Renaissance of the Fifteenth Century Spring 4 credits. T R 10:10–11:25. C. Lazzaro. The course examines the painting, sculpture, and architecture of the fifteenth century in Italy. Emphasis is on Florence as the center of creative activity, but the art produced in other city-states in north and central Italy are also studied. The principal painters, sculptors, and architects are considered in depth, along with themes such as the rise of portraiture and of secular subject matter, and, finally, the major secondary scholarship on the period is critically analyzed.]


[354 European Painting of the Seventeenth Century Fall. 4 credits. T R 10:10–11:25. S. McGhee.]

[357 European Art of the Eighteenth Century 4 credits. Not offered 1986–87.]


[365 Art from 1940 to the Present Spring 4 credits. T R 12:20–1:35. J. Bernstock. A consideration of the major movements in twentieth-century art including abstract expressionism, deconstructionism, the rise of portraiture and of secular subject matter, and, finally, the major secondary scholarship on the period is critically analyzed.]

[371 Architectural History of Washington, D.C. Fall or spring. Variable credit. Only for students in the Cornell-in-Washington program. Only for nonarchitects. P Scott. A historical and critical survey of the architecture of Washington. Attention will be given to the periods, styles, architects, and clients—public and private—of the notable buildings and to the urban-scapes of the nation's capital. The vocabulary of architectural analysis and criticism will be taught. Field trips required.]


[384 The Arts of Japan Fall. 4 credits. M W 10:10, plus disc to be arranged. P. Graham. A general overview of the arts of Japan, intended to introduce the student to the cultural achievements of the Japanese in such areas as architecture, garden design, painting, and sculpture. Although the course will follow a general chronological pattern, the arts will be approached topically, with special concentration on developments in the postmedieval period. The tea ceremony, ceramics, and the minor arts will receive particular attention through study of the Herbert F. Johnson Museum collection. The course will begin with an examination of Japan's earliest pottery traditions and end with a detailed discussion of the wood-block prints of the nineteenth century. The museum collection will be used for written assignments.]


[388 Architecture and Gardens of Later Japan Spring. 4 credits. M W 12:20 plus disc. P. Graham. A consideration of architecture in Japan from the fifteenth century to the modern period with special emphasis on castle building, tea houses and gardens, secular buildings, and the development of urban architectural forms.]

[396 The Arts in Southeast Asia Spring. 4 credits. T R 10:10–11:25. S. J. O'Connor. The arts of Southeast Asia will be studied in their social context, since in traditional societies art plays a role in most of the salient occasions of life. Special emphasis will be devoted to developments in Cambodia, Thailand, and Bali. Among topics covered will be the shadow-puppet theater of Java, ceramics, architecture, and sculpture.]

Seminars

Courses at the 400 and 500 level are open to upperclass students, majors, and graduate students. All seminars involve the writing and presentation of research papers. Enrollment is limited to 15 students, and permission of the instructor is required. Students may repeat courses that cover a different topic each semester.

[401 Independent Study Fall or spring. 2–4 credits. May be repeated for credit. Prerequisite: permission of a department faculty member. Hours to be arranged.]

[402 Independent Study Fall or spring. 2–4 credits. May be repeated for credit. Prerequisite: permission of a department faculty member. Hours to be arranged.]


[407 Seminar on Museum Issues Fall. 4 credits. Prerequisite: permission of instructor. M 2:30–4:30. T. W. Leavitt. This course will explore the issues, ideas, problems, and opportunities faced by art museums in contemporary American society. The nature of museum research, the theory of museum education, connoisseurship, effective museum leadership, and the role of art museums in American cultural life will be discussed.]

[421 History of Art Criticism 4 credits. Not offered 1986–87.]

431 Greek Sculpture (also Classics 431) 4 credits. Not offered 1986–87
A. Ramage.

432 Sardis and the Cities of Asia Minor (also Classics 432) Spring. 4 credits. Prerequisite: permission of instructor.
The growth and interaction of the Greek and Roman cities and their art will be studied using the finds and conclusions from the Cornell-Harvard excavations at Sardis as a focal point. The magnificent works of art and architecture will be set beside domestic remains and objects of daily life. We shall examine local themes in the context of the history, the topography, and the larger political and economic scene in Asia Minor. Topics will range over a long period, from the late Bronze Age to the early Byzantine era.


441 Studies in Flemish Art 4 credits. Not offered 1986–87

447 The Artist's Self-Image in the Renaissance and Baroque Spring. 4 credits. Prerequisite: permission of instructor.
T 2:30–4:30. C. Lazzaro.
The purpose of the course is to acquire a familiarity with the theoretical and practical questions of the artist's role in the Renaissance and baroque and to trace the development and changes of theory and practice, image and self-image of the artist. The aim is equally to acquire a broad background and to use that background as a foundation for individual research and critical thinking on a specific topic concerning artists or architects in the Renaissance or baroque.


451 Prints of the Fifteenth through the Seventeenth Century Fall. 4 credits. Prerequisite: permission of instructor.
The course will investigate the developments in printmaking and its major masters from its beginnings through the seventeenth century, focusing primarily on the prints in the Herbert F. Johnson Museum of Art. Classes will meet frequently in the museum, and students will write papers on a print of their choice. Connoisseurship will be emphasized, as well as the uniqueness of woodcut, engraving, and etching as expressive mediums, and finally the subjects and functions particular to the prints of these centuries.


463 Studies in Modern Art: The Image of the Self Fall. 4 credits. Prerequisite: permission of instructor.
T 2:30–4:30. J. E. Bernstock.
The study of both figurative and abstract works of art that convey the modern artist's self-image. Emphasis will be placed on an examination of how the artist has expressed the human condition as a projection of his own and how the forms of this expression have changed since 1940.

464 Studies in Modern Art Spring. 4 credits. Prerequisite: permission of instructor.
R 2:30–4:30. J. E. Bernstock.


477 Impressionism in America and France Spring. 4 credits. Prerequisite: permission of instructor.
This seminar presents the works of nineteenth-century American painters who were influenced by the French impressionist school. Issues to be examined include the careers of individual artists, comparative treatments of French and American colleagues, American criticism of French impressionism, and the formation of The Ten, a prominent group of impressionists in Boston. Lectures include treatments of Monet and Degas and the history of impressionism in America. American artists to be highlighted include Mary Cassatt, Theodore Robinson, William Metcalf, John S. Sargent, and others.

[481 The Arts in Modern China 4 credits. Not offered 1986–87. M. W. Young.]

482 Ceramic Art of China and Southeast Asia Spring. 4 credits. Prerequisite: permission of instructor.
The Herbert F. Johnson Museum's collection of Asian ceramics will provide a principal resource of study. Lectures, reports, and discussions.

483 Chinese Art of the T'ang Dynasty 4 credits. Not offered 1986–87

484 Studies in Japanese Art and Architecture Spring. 4 credits. Prerequisite: permission of instructor.
M 2:30–4:30. Staff.


493 Honors Work Fall or spring. 4 credits. Intended for senior art history majors who have been admitted to the honors program. Hours to be arranged. Staff. Basic methods of art historical research will be discussed and individual readings assigned, leading to the selection of an appropriate thesis topic.

494 Honors Work Fall or spring. 4 credits. Prerequisite: History of Art 493. Hours to be arranged. Staff.
The student, under faculty direction, will prepare a senior thesis.


550 Seminar in Baroque Art Spring. 4 credits. Prerequisite: permission of instructor.
Topic for 1987 to be announced.


580 Problems in Asian Art Fall. 4 credits. Prerequisite: permission of instructor.

Topic for 1986: the flowering of Southeast Asian Art. Developments associated with the appearance of early cities and monumental art in the seventh and eighth centuries will be explored.

591–592 Supervised Reading 591, fall; 592, spring. 4 credits. May be repeated for credit. Limited to graduate students. Staff.

[594 Methodology Seminar 4 credits. Not offered 1986–87.]


Indonesian
See Modern Languages, Literatures, and Linguistics.

FALCON Program:

Italian
See Modern Languages, Literatures, and Linguistics.

Japanese
See Department of Asian Studies, and Modern Languages, Literatures, and Linguistics.

FALCON Program:
E. Jorden, 321 Morrill Hall, 255-0736.

Javanese
See Modern Languages, Literatures, and Linguistics.

Latin
See Department of Classics.

Linguistics

J. W. Gair, director of undergraduate studies (407 Morrill Hall, 255-5110).
See Modern Languages, Literatures, and Linguistics.

Mathematics


Mathematics is the language of modern science; basic training in the discipline is essential for those who wish to understand, as well as for those who wish to take part in, the important scientific developments of our time. Acquaintance with mathematics is also extremely useful for students in the social sciences and valuable for anyone interested in the full range of human culture and the ways of knowing the universe in which we live.

The Department of Mathematics faculty has strong groups specializing in algebra, number theory, real and complex analysis, Lie groups, topology and geometry, logic, probability and statistics, mathematical physics, and applied mathematics. Related departments at Cornell have specialists in computer science, operations research, linear programming, and game theory, and courses in these topics can be integrated readily into the mathematics major.

The department offers a rich variety of undergraduate courses, and many of its beginning graduate courses are suitable for advanced undergraduates as well. Under some conditions, a student may carry out an independent reading and research project for college credit, under the supervision of a faculty member.

Members of the department are available to discuss with students the appropriate course for their levels of ability and interest, and students are urged to avail themselves of this help.

Students who wish to take any of the courses numbered 300 or above are invited to confer, before registering, with the instructor concerned. The level of a course is indicated by the first digit of the course number; roughly, 1, 2, indicate undergraduate classes; 3, 4, upperclass courses; 5, 6, graduate courses. The subject matter of classes is indicated by the second digit: 0, general; 1, 2, analysis; 3, 4, algebra; 5, 6, topology and geometry; 7, probability and statistics; 8, logic; 9, other.

Midterm grades, when required, will be S or U only, except in special circumstances. In all 600-level courses, final grades will be S-U only, with the exception of 690. In courses with numbers below 600, students will receive letter grades, with the exception of non-mathematics majors who have requested an S-U grade.

Advanced Placement

Secondary school students are strongly urged to take one of the two advanced placement examinations of the College Entrance Examination Board in their senior year. Freshmen who have had some calculus but who have not taken an advanced placement examination should take the placement examination in mathematics offered at Cornell just before the beginning of classes in the fall. It is most important that anyone with any knowledge of calculus carefully read "Advanced Placement of Freshmen," p. 13.

The Major

The mathematics major adapts to a number of purposes. It can emphasize the theoretical or the applied. It can be appropriate for professionals and nonprofessionals alike. It can be broad or narrow. Questions concerning the major should be brought to a departmental representative.

Prerequisites: The preferred prerequisites are Mathematics 221 —222 or 293 —294. A unit on infinite sequences is required offered in Mathematics 112, 122, and 192. (Students with two semesters of advanced placement usually have had the equivalent of 217) Normally students will be admitted to the major only when they have grades of B — or better in all sophomore-level mathematics courses they have taken. Alternative prerequisites are Mathematics 213 —231, normally with grades of B — or better.

Requirements

There are five requirements for the major:

1) Computer Science 100. Students are urged to take this course before the end of the sophomore year.
2) Two courses in algebra. Eligible courses are Mathematics 431 or 432, 434 or 432 or 332, 336.
3) Two courses in analysis. Eligible courses are Mathematics 411 or 413, 412 or 414, 421, 422, 423, 418.
4) Further high-level mathematical courses. Any one of the following is sufficient:
   a) three mathematics courses numbered 371 or higher, other than those used to satisfy the previous two requirements. Computer Science 621 and/or 622 may also be used toward satisfying this requirement.
   b) Four Computer Science courses numbered 310 or higher.
   c) Four Operations Research and Industrial Engineering courses numbered 320 to 383 or 431 to 472, but not 350.
5) One course dealing with mathematical models. Any one of the following is sufficient:
   a) Mathematics 305 (not offered every year).
   b) Physics 208, 213, or 217.
   c) Computer Science 211, provided no Computer Science course has been used toward satisfying the previous requirements.
   d) One course other than Physics 112 or 207 from outside mathematics with serious mathematical content and dealing with scientific matters, provided the course has not been used toward satisfying the previous requirement.

Major advisers can alter these requirements upon request of an advisee, provided the intent of the requirements is met.

Sample Major Programs

Below are some suggestions for what the schedule of a student with a mathematics major might look like. Many variations are possible.

For Graduate School in Mathematics

First two years: Mathematics 111 —122—221 —222, Computer Science 100, Physics 207 —208.

Last two years: Mathematics 433 —434, 433 —434, 453 —454, two of 418, 428, 471.

The sophomore courses Mathematics 221 —222 are more suitable than 293 —294 in this case. A student planning to enter graduate school may get by with 411 —412 and 431 —432 instead of the honors versions 413 —414 and 433 —434, but the honors versions are strongly recommended.

For Many Technical Careers

First two years: Mathematics 111 —122—221 —222 or 191 —192—293 —294, Computer Science 100 —211, Physics 122 —213 or 207 —208.

Last two years: Mathematics 431 —336, 421 —422, 428, 471 —472.

Two or more semesters of computer science are highly recommended.

For Emphasis on Computer Science

First two years: Mathematics 111 —122—221 —222, Computer Science 100 —211, Physics 122 —213 or 207 —208.

Last two years: Mathematics 431 —432, 421 —422, Computer Science 310, 314, 381, 441, 421.

Requirement 5 is met by Computer Science 381 in this sample program. Students interested in computer science should give consideration to a double major in mathematics and computer science.

For Emphasis on Operations Research

First two years: Mathematics 111 —122—221 —222 or 191 —192—293 —294, Computer Science 100 —211. Last two years: Mathematics 431 —432, 421 —422, 471.

Operations Research and Industrial Engineering 320, 321, 361, two of 431, 432, 435, and possibly 462 or 471.

For Prelaw or Premed (first example)

First two years: Mathematics 111 —122 —221 —222, Computer Science 100, Physics 207 —208.

Last two years: Mathematics 431 —336, 411 —421, 381, 471 —472.

The sophomore courses Mathematics 221 —222 are recommended rather than 293 —294 in this sample because they provide better preparation for 411.

For Prelaw or Premed (second example) or Prebusiness

First two years: Mathematics 111 —122 —213 —231, Computer Science 100 —211.

Last two years: Mathematics 332 —336, two of 411 —421 —418, and also 381, 403, 451.

A course in statistics is also strongly recommended.

Honors. Honors in mathematics will be awarded on the basis of a high level of performance in departmental courses. Further requirements, if any, will be announced during the year.

Distribution Requirement

The distribution requirement is satisfied in mathematics by any 6 credits, not including more than one course from Mathematics 105, 107, 403. Computer Science 100 may be used for three of these credits. The mathematics distribution requirement is also satisfied by a score of 3 or higher on the CEEB calculus BC examination. Mathematics 109 or ALS 115 (College of Agriculture and Life Sciences) may not be used to satisfy the requirement.

Basic Sequences

Precalculus

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<th>Course Numbers</th>
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<tbody>
<tr>
<td>Course</td>
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<tr>
<td>Description</td>
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<tr>
<td>Mathematics</td>
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<tr>
<td>1) Algebra and trigonometry to prepare students for calculus</td>
</tr>
<tr>
<td>109*</td>
</tr>
<tr>
<td>Agriculture and Life Sciences 5*</td>
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<tr>
<td>2) Algebra, analytic geometry, elements of calculus</td>
</tr>
<tr>
<td>Agriculture and Life Sciences 115*</td>
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*Mathematics 109 and ALS 5 do not carry credit for graduation.

**Students who want a second semester of mathematics after ALS 115 may take Mathematics 107 or 105 or, if they need more calculus, 111.

Calculus

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<th>Course Numbers</th>
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<tbody>
<tr>
<td>Course</td>
</tr>
<tr>
<td>Description</td>
</tr>
<tr>
<td>Mathematics</td>
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<tr>
<td>1) Standard three-semester sequence for students who do not expect to take advanced courses in mathematics</td>
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<tr>
<td>111 —122 —213</td>
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<tr>
<td>2) Usual sequence for prospective mathematics majors and others who expect to take advanced courses in mathematics</td>
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<tr>
<td>111 —122 —221 —222</td>
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<tr>
<td>3) Calculus for engineers</td>
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<tr>
<td>191 (or 193*) (also taken by some physical science majors)</td>
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<tr>
<td>192 —293 —294</td>
</tr>
</tbody>
</table>

Mathematics 191 (or 193) may be substituted for 111 in sequences 1 and 2. Mathematics 193 is a variant of 191 for students who have had some calculus in high school but have not received advanced placement. Sequences 2 and 3 are two-year sequences that include some linear algebra.

Students who take sequence 1 may learn some linear algebra by taking Mathematics 231. A student whose performance in 112 is exceptional may switch to sequence 2 and take 221.
111 Calculus Fall, spring, or summer. 4 credits. Limited to 22 students a section. Prerequisite: Mathematics 109 or three years of high school mathematics, including trigonometry.* Hours to be arranged. Prelims: fall, 7:30 p.m., Sept. 23, Oct. 30, Dec. 2; spring, 7:30 p.m., Feb. 24, Mar. 31, Apr. 30. Plane analytic geometry, differentiation and integration of algebraic and trigonometric functions, applications of differentiation, logarithmic and exponential functions.

112 Calculus Fall, spring, or summer. 4 credits. Limited to 22 students a section. Prerequisites: Mathematics 106, 111, or 113 with a grade of C or better. Those who do extremely well in Mathematics 111 or 113 should take 112 instead of 112, unless they plan to continue with 213. * Hours to be arranged. Prelims: fall, 7:30 p.m., Sept. 23, Oct. 30, Dec. 2; spring, 7:30 p.m., Feb. 24, Mar. 31, Apr. 30. Applications of integration, methods of integration, plane curves and polar coordinates, vectors and solid analytic geometry, infinite series, complex numbers, introduction to partial derivatives.

113 Calculus Not offered 1986–87] Fall or spring. 4 credits. Prerequisite: performance at a high level in Mathematics 111 or 113 or permission of the department. Students planning to continue with Mathematics 213 are advised to take 112 instead of this course. * Fall: M W F 10:10, 11:15, or 12:20. Spring: M W F 11:15 or 12:20. Prelims: fall, 7:30 p.m., Sept. 23, Oct. 30, Dec. 2; spring, 7:30 p.m., Feb. 24, Mar. 31, Apr. 30. Differentiation and integration of transcendental functions, the techniques of integration, applications, polar coordinates, infinite series, and complex numbers, as well as an introduction to proving theorems. The approach is more theoretical than in Mathematics 112.

119–193 Calculus for Engineers Fall, spring, or summer. 4 credits. Prerequisite: three years of high school mathematics, including trigonometry. Mathematics 193 is a course parallel to 191 for students who have had a substantial amount of calculus in high school but who did not place out of 191. Although the same topics will be covered in Mathematics 193 as in 191, some may be treated in greater depth.

191: lecs, M W 10:10, plus 2 hours to be arranged. 193: lecs, M W F 9:05 or 11:15, plus 2 hours to be arranged. Prelims: 7:30 p.m., Sept. 23, Oct. 30, Dec. 2. Plane analytic geometry, differential and integral calculus, and applications.

192 Calculus for Engineers Fall, spring, or summer. 4 credits. Prerequisite: Mathematics 191 or 193. * Fall: lecs, M W F 9:05 or 11:15, plus 2 hours to be arranged. Spring: lecs, M W F 9:05 or 11:15, plus 2 hours to be arranged. Prelims: fall, 7:30 p.m., Sept. 23, Oct. 30, Dec. 2; spring, 7:30 p.m., Feb. 24, Mar. 31, Apr. 30. Methods of integration, polar coordinates, vectors and parametric equations, vector functions of one variable, infinite series, complex numbers, introduction to partial derivatives.


221 Linear Algebra and Calculus Fall or spring. 4 credits. Prerequisite: Mathematics 122 with a grade of B or better, or permission of instructor. Fall: M W F 9:05, 10:10, or 11:15. Spring M W F 10:10 or 11:15. Prelims: fall, 7:30 p.m., Sept. 23, Oct. 30, Dec. 2; spring, 7:30 p.m., Feb. 26, Mar. 31, May 5. Linear algebra and differential equations. Topics include vector algebra, linear transformations, matrices, linear differential equations, as well as an introduction to proving theorems.

222 Calculus Fall or spring. 4 credits. Prerequisite: Mathematics 221. Fall: M W F 11:15 or 12:20. Spring: M W F 9:05 or 10:10 or 11:15. Prelims: fall, 7:30 p.m., Sept. 23, Oct. 30, Dec. 2; spring, 7:30 p.m., Feb. 26, Mar. 31, May 5. Vector differential calculus, calculus of functions of several variables, multiple integrals.

293 Engineering Mathematics with Microcomputers Fall or spring. 4 credits. Prerequisites: Mathematics 192 plus a knowledge of computer programming equivalent to that taught in Engineering Common Courses 105. In exceptional circumstances, Mathematics 192 and 293 may be taken concurrently.

294 Engineering Mathematics with Microcomputers Fall or spring. 4 credits. Prerequisite: Mathematics 293.

105 Finite Mathematics for Biologists (also Theoretical and Applied Mechanics 105) Fall. 3 credits. Prerequisite: three years of high school mathematics, including trigonometry and logarithms.* Lecs, T R 12:20, plus 2 hours to be arranged. Prelims: 7:30 p.m., Sept. 23, Oct. 30, Dec. 2. Mathematical modeling, sets, functions, and graphing (including use of log and semi-log paper). Probability (with some applications to genetics). Matrices, systems of linear equations, and Markov chains. Examples from biology are used.

106 Calculus for Biologists (also Theoretical and Applied Mechanics 106) Spring. 3 credits. Prerequisite: Mathematics 105 or 109 or ALS 115 or permission of instructor. (A strong background in functions is required.) Mathematics 111, rather than 106, is recommended for those planning to take 112.* Lecs, T R 11:15, plus 2 hours to be arranged. Prelims: 7:30 p.m., Feb. 24, Mar. 31, Apr. 30. Introduction to differential and integral calculus, partial derivatives, elementary differential equations. Examples from biology are used.

107 Finite Mathematics Fall or summer. 3 credits. Prerequisite: three years of high school mathematics, including at least two years of high school algebra. This course cannot be used toward fulfillment of the mathematics requirement for biology majors.* Lecs, T R 12:20, plus 2 hours to be arranged. Prelims: 7:30 p.m., Sept. 23, Oct. 30, Dec. 2. Functions, enumeration, permutations and combinations, probability, vectors and matrices, Markov chains.

109 Precalculus Mathematics Summer. 3 transcript credits only; cannot be used toward graduation. M–F 8:30

This course is designed to prepare students for Mathematics 111. Algebra, trigonometry, logarithms, and exponents are reviewed.

*See the list of courses with overlapping content at the end of the introduction.
Applicable Mathematics

421 Applicable Mathematics
Fall, spring, or summer. 4 credits. Prerequisites: high level of performance in Mathematics 294, or 221 and 222, or 213 and 231. Graduate students who need mathematics in their work and who have had a solid advanced calculus course and complex variables course as undergraduates should take Mathematics 515–516. With less preparation, they should take Mathematics 421–422–423.

T W R F 12:20. Prelims: fall, 7:30 p.m., Oct. 9; Nov. 20; spring, 7:30 p.m., Mar. 10, Apr. 21.


422 Applicable Mathematics
Fall, spring, or summer. 4 credits. Prerequisite: Mathematics 421. T W R F 12:20. Prelims: fall, 7:30 p.m., Oct. 9; Nov. 20; spring, 7:30 p.m., Mar. 10, Apr. 21.


423 Applicable Mathematics
Fall or spring. 4 credits. Prerequisite: Mathematics 421; however, students who have not taken 422 should talk to the instructor before taking this course.

T W R F 12:20. Prelims: fall, 7:30 p.m., Oct. 9; Nov. 20; spring, 7:30 p.m., Mar. 10, Apr. 21.


425 Numerical Solutions of Differential Equations
Spring. 4 credits. Prerequisites: Mathematics 222 or 294, one course in higher level mathematics, and Computer Science 321, or permission of instructor. This course is a natural sequel to Computer Science 321.


427 Introduction to Ordinary Differential Equations
Fall. 4 credits. Prerequisite: Mathematics 222 or 294 or permission of instructor.

T R 10:10–11:25.

Course covers basic existence, uniqueness, and stability theory together with methods of solution and methods of approximation. Topics include singular points, series solutions, Sturm-Liouville theory, transform methods, approximation methods, and application to physical problems.

428 Introduction to Partial Differential Equations
Spring. 4 credits. Prerequisite: Mathematics 222 or 294 or permission of instructor.

T R 10:10–11:25.

Topics selected from first-order quasilinear equations, classification of second-order equations, with emphasis on maximum principles, existence, uniqueness, stability. Fourier series methods, approximation methods.

Analysis

411–412 Introduction to Analysis
Fall; 412, spring. 4 credits each term. Prerequisite: Mathematics 222. Students using numerical analysis theory and Lebesgue integration for advanced probability courses should take Mathematics 413–414 or arrange to audit the first few weeks of Mathematics 521. Undergraduates who plan to attend graduate school in mathematics should take 413–414.

T R 8:40–9:55.

An introduction to the theory of functions of real variables, stressing rigorous logical development of the subject rather than techniques of applications. Topics include Euclidean spaces, the real number system, continuous and differentiable functions, Riemann integral, uniform convergence and approximation theorems, Fourier series, calculus in several variables, and differential forms.

413–414 Introduction to Analysis
Fall; 414, spring. 4 credits each. Prerequisite: Mathematics 222.

T R 8:40–9:55.

Honors version of Mathematics 411–412. Metric spaces are included in Mathematics 413, and 413 proceeds at a faster pace than 411. The second semester includes an introduction to the Lebesgue integral.

418 Introduction to the Theory of Functions of One Complex Variable
Spring. 4 credits.

Prerequisite: Mathematics 222 or 294 or 213. May be offered only in alternate years.

T R 1:25–2:40.

A rigorous introduction to complex variable theory. Complex numbers. Differential and integral calculus for functions of a complex variable, including Cauchy's theorem and the calculus of residues. Elements of conformal mapping.

Algebra

231 Linear Algebra
Spring or summer. 3 credits. Prerequisite: one year of calculus.


May 5.

Vectors, matrices, and linear transformations, affine and Euclidean spaces, transformation of matrices, and eigenvalues.

332 Algebra and Number Theory
Fall. 4 credits. Prerequisite: one year of calculus and one course from Mathematics 221, 231, and 294. Mathematics 332 does not satisfy prerequisites for courses numbered 500 and above.

M W F 9:05.

Various topics from modern algebra and number theory; usually including rings, fields, and finite groups. Motivation and examples are derived mostly from geometry, arithmetic, and congruence problems on the integers.

336 Applicable Algebra
Spring. 4 credits.

Prerequisites: Mathematics 221, 294, or 231.

M W F 9:05.

An introduction to concepts and methods of abstract algebra that are of importance in science and engineering. Applications of the theory to concrete problems will be stressed. Each year the course will treat aspects usually chosen from the following topics: partially ordered sets, lattices, graph theory, and Boolean algebras; finite machines and languages; applications of groups, fields, and modular arithmetic, such as error-correcting codes, elementary number theory, fast Fourier transform; difference equations. Additional topics may be chosen by the instructor.

431–432 Introduction to Algebra
Fall; 432, spring. 4 credits each. Prerequisite: Mathematics 221 or 231. Undergraduates who plan to attend graduate school in mathematics should take 433–434.

M W F 10:10.

431: An introduction to linear algebra, including the study of vector spaces, linear transformations, matrices, and systems of linear equations; quadratic forms and inner product spaces; canonical forms for various classes of matrices and linear transformations; determinants. 432: an introduction to various topics in abstract algebra, including groups, rings, fields, factorization of polynomials and integers, congruences, and the structure of finitely generated modules over Euclidean domains with application to canonical forms of matrices.

433–434 Introduction to Algebra
Fall; 434, spring. 4 credits each. Prerequisite: Mathematics 221 or 231.

M W F 10:10.

Honors version of Mathematics 431–432. Mathematics 433–434 will be more theoretical and rigorous than 431–432 and will include additional material such as multilinear and exterior algebra.

Geometry and Topology

451–452 Classical Geometries
Fall or summer; 452, spring. 4 credits each term. Prerequisite: Mathematics 221 or 231 or permission of instructor.


Foundations of geometry. Various geometric topics, including Euclidean, non-Euclidean, and projective geometry and rigidity theory.

453 Introduction to Topology
Fall. 4 credits.

Prerequisites: Mathematics 411 and 221, or permission of instructor.

M W F 12:20.

Basic point set topology, connectedness, compactness, metric spaces, fundamental group. Application of these concepts to surfaces such as the torus, the Klein bottle, the Mobius band.

454 Introduction to Differential Geometry
Spring. 4 credits.

Prerequisite: Mathematics 222 or 294, plus at least one mathematics course numbered 300 or above. Mathematics 454 is not a prerequisite.

M W F 12:20.

Differential geometry of curves and surfaces. Curvature, geodesics, differential forms. Introduction to n-dimensional Riemannian manifolds. This material provides some background for the study of general relativity; connections with the latter will be indicated.

Probability and Statistics

372 Elementary Statistics
Fall. 4 credits.

Prerequisites: one year of calculus, and Computer Science 100 or 101 or 108 or permission of instructor. A terminal course for students who will take no further courses in statistics.

M W F 9:05.

Evening prelims may be given. Introduction to the principles underlying modern statistical inference, to the practical application of statistical techniques, and to the rationale underlying the choice of statistical methods in various situations. Topics in probability that are essential to an understanding of statistics. Homework involves statistical analysis of data sets on hand calculators and on a computer by means of packaged programs.

471 Basic Probability
Fall. 4 credits.

Prerequisite: Mathematics 221. May be used as a terminal course in basic probability. Intended primarily for those who will continue with Mathematics 472.


Topics include combinations, important probability laws, expectations, moments, moment-generating functions, limit theorems. Emphasis is on diverse applications and on development of use in statistical applications. See also the description of Mathematics 571.
472 Statistics Spring. 4 credits. Prerequisite: Mathematics 471 and knowledge of linear algebra such as taught in Mathematics 221.

M W F 9:00-9:50 A.M. Mar. 10, Apr. 21.

Classical and recently developed statistical procedures are discussed in a framework that emphasizes the basic principles of statistical inference and the rationale underlying the choice of these procedures in various settings. These settings include problems of estimation, hypothesis testing, large sample theory.

473 Further Topics in Statistics Fall. 4 credits. Prerequisite: Mathematics 472 or 574.

M W F 11:15-12:10 P.M.

More detailed discussion of some of the topics not covered at length in Mathematics 472. Design and analysis of experiments. Multivariate analysis. Nonparametric inference; robustness; Sequential analysis. For corresponding subject matter taught in more detail, see description of Mathematics 573 and 675.

Mathematical Logic 481 Mathematical Logic Spring. 4 credits. Prerequisite: Mathematics 221. May be offered only in alternate years.

TR 1:40-2:55 P.M.


486 Applied Logic (also Computer Science 486) Spring or summer. 4 credits. Prerequisite: Mathematics 222 or 294, Computer Science 100, and some additional course in mathematics or theoretical computer science.

TR 10:10-11:25 A.M. plus one-hour lab to be arranged.

Propositional and predicate logic. Classical proof procedures. Completeness and compactness by tableau. Equational logic. Herbrand Universes, the resolution method, and unification. Rewriting rules and equational logic Knuth-Bendix method and the congruence closure algorithm and α-calculus reduction strategies. Restrictions on resolution and their completeness. Introduction to automatic theorem proving. Topics in Prolog, Lisp, or ML on microcomputers or, possibly, exposure to a larger system such as Nuprl. Input resolution and Prolog. Applications to expert systems and program verification.

Graduate Courses Students interested in taking graduate courses in mathematics should consult the department for further course details, times, and possible changes in courses as described below.


This course will be devoted to the history of mathematics in the nineteenth century from the original sources, with emphasis on the history of the foundations of analysis and of the foundations of commutative algebra. Typical authors in algebra who will be studied are Lagrange, Ruffini, Gauss, Abel, Galois, Dirichlet, Kummer, Kronecker, Dedekind, Weber, M. Noether, Hilbert, Steinitz, Artin, and E. Noether. Typical authors in analysis who will be studied are Cauchy, Fourier, Bolzano, Dirichlet, Riemann, Weierstrass, Heine, Cantor, Peano, and Hilbert. If time permits, a sketch will be given of the history of probability and statistics from Bernoulli to Pearson. Students will be required to read and explain one important nineteenth-century paper.

*See the list of courses with overlapping content at the end of the introduction.

511–512 Real and Complex Analysis 511, fall; 512, spring.

511: measure and integration, functional analysis. 512: complex analysis, Fourier analysis, and distribution theory.

513–514 Topics in Analysis 513, fall; 514, spring.

515–516 Mathematical Methods in Physics 515, fall; 516, spring. 4 credits each. Intended for graduate students in physics or related fields who have had a strong advanced calculus course and at least two years of general physics. A knowledge of the elements of finite dimensional vector space theory, complex variables, separation of variables in partial differential equations, and Fourier series will be assumed. The course overlaps with parts of Mathematics 421–422–423. Undergraduates will be admitted only with permission of instructor. Mathematics 515 is a prerequisite for 516.

T W R F 12:20 P.M.

Topics designed to give a working knowledge of the principal mathematical methods used in advanced physics. A brief discussion of some basic notions: metric space, vector space, linearity, continuity, integration. Generalized functions (Schwartz distributions). Fourier series and Fourier integrals. Saddle point method. Linear operators. Differential operators and integral operators, the equations and eigenvalue problems connected with them and the special functions arising from them. Elements of group theory. The rotation group and its representations.


Basic theory of ordinary differential equations.

519–520 Partial Differential Equations 519, fall; 520, spring.

Basic theory of partial differential equations.

521 Measure Theory and Lebesgue Integration Fall.

Measure theory, integration, and Lp spaces.

522 Applied Functional Analysis Spring.

Spectral theorem for bounded operators, spectral theory for unbounded operators in Hilbert space, compact operators, distributions. Applications.

531–532 Algebra 531, fall; 532, spring.

531: finite groups, field extensions, Galois theory, rings and algebras, tensor and exterior algebra. 532: Wedderburn structure theorem, Brauer group, group cohomology, Dedekind domains, primary decomposition, Hilbert basis theorem, local rings.


An introduction to number theory suitable for first-year graduate students and advanced undergraduates. Choice of topics discussed depends on the instructor. In previous years the text has been A Course in Arithmetic, by J. P. Serre; the topics covered have included quadratic forms, quadratic reciprocity, and modular forms.

549 Lie Groups and Differential Geometry Spring.

551 Introductory Algebraic Topology Spring.

Fundamental group and covering spaces. Homology theories for complexes and spaces.

552 Differentiable Manifolds Fall. Prerequisites: advanced calculus and some elementary point-set topology (e.g., knowledge of the concepts of continuity, compactness, and connectedness).

This course will be an introduction to differential topology, intended for graduate students and beginning graduate students. The first part of the course will emphasize examples and constructions of manifolds. Topics will include Cr and analytic structures, non-smooth manifolds, immersions and imbeddings, tangent bundles, tubular neighborhoods, transversality, cobordism, vector fields and dynamical systems, foliations.


Topics from general topology, Introduction to geometric properties of manifolds.

571–572 Probability Theory 571, fall; 572, spring.

Prerequisites: a knowledge of Lebesgue integration theory, at least on the real line. Students can learn this material by taking parts of Mathematics 413–414 or 421–422.


571–574 Probability and Statistics 571, fall; 574, spring.

This course is a prerequisite to all advanced courses in statistics.

571: same as Mathematics 571 above. 574: Topics include an introduction to the theory of point estimation, consistency, efficiency, sufficiency, and the method of maximum likelihood; the classical tests of hypotheses and their power; the theory of confidence intervals; the basic concepts of statistical decision theory; the fundamentals of sequential analysis. Intended to furnish a rigorous introduction to mathematical statistics.

573 Experimental Design, Multivariate Analysis Fall.


Rationale for selection of experimental designs and algorithms for constructing optimum designs. Optimum properties and distribution theory for classical analysis of variance procedures and their simplest multivariate analogues.

575 Sequential Analysis, Multiple Decision Problems Fall. Prerequisite: a course in mathematical statistics such as Mathematics 574.


A study of nonparametric techniques, especially order statistics, rank order statistics, scores, local optimality properties, and perhaps some asymptotic theory.

581 Logic Spring.

Basic topics in mathematical logic, including propositional and predicate calculus; formal number theory and recursive functions; completeness and incompleteness theorems.

611–612 Seminar in Analysis Spring.

613 Functional Analysis Spring.

Topological vector spaces. Banach and Hilbert spaces. Banach algebras. Additional topics to be selected by instructor.


623 Several Complex Variables Not offered 1986–87.

627–628 Seminar in Partial Differential Equations 627 fall; 628 spring.

631–632 Seminar in Algebra 631, fall; 632, spring.

635 Topics in Algebra I Fall.

Selection of advanced topics from algebra, algebraic number theory, and algebraic geometry. Course content varies.

Mathematics 163
Topics in Algebra II  Spring. Selection of advanced topics from algebra, algebraic number theory, and algebraic geometry. Course content varies.


Seminar in Topology  Fall, 651, fall; 652, spring.

Algebraic Topology  653, fall, 654, spring. Duality theory in manifolds, applications, cohomology operations, spectral sequences, homotopy theory, general cohomology theories, categories and functors.

Mathematical Foundations for Computer Modeling and Simulation (also Computer Science 655) Fall. 4 credits. Prerequisite: Mathematics 431 and 432 or the equivalent, both in content and in the level of mathematical sophistication, or permission of instructors. Not offered 1986–76. M W F 10:10.

This course will have two parts, one purely mathematical, the other applied. The former is intended to introduce students to theoretical tools that are relevant to the study of robotics, solid modeling, and simulation. These tools will be drawn from the areas of (real and complex) algebraic geometry, topology, differential geometry, and differential equations. The latter part of the course will provide applications that illustrate uses of the mathematics and point the way to needed further developments.

Advanced Topology  657, fall, 658, spring. Selection of advanced topics from modern algebraic, differential, and geometric topology. Course content varies.

Seminar in Geometry  [661 not offered 1986–87], spring.


A course taught occasionally to cover special topics in theoretical statistics not treated in other listed courses. Typical of the subjects that will be treated are time series analysis, and classification and cluster analysis.

Seminar in Probability and Statistics  671–672

Multivariate Analysis  Spring.


Stochastic Processes  677, fall; 678, spring.

Seminar in Logic  681, fall, 682, spring.

Model Theory  Spring.


Topics in metamathematics. Course content varies.


Models of set theory. Theorems of Gödel and Cohen, recent independence results.
Chinese
Language and Linguistics

101–102 Elementary Course 101, fall; 102, spring. 6 credits each term. Prerequisite for Chinese 102: Chinese 101 or equivalent. Lecs. MWF 9:05; drill, M–F 8 or 2:30. Staff. A semi-intensive course for beginners or for those who have been placed in the course by examination. The course gives a thorough grounding in all the language skills: listening, speaking, reading, and writing.

111–112 Cantonese Elementary Speaking 111, fall; 112, spring. 3 credits each term. Prerequisites: for Chinese 111, permission of instructor; for Chinese 112, Chinese 111. Both Chinese 112 and 114 or equivalents are necessary to fulfill any language requirements. Lecs. T 11:15; drills. MWF 10:10. Staff. Conversation in standard Cantonese as spoken in Hong Kong and Canton.

113–114 Cantonese Elementary Readings 113, fall; 114, spring. 3 credits each term. Prerequisite: Cantonese 112 or equivalent are necessary to fulfill any language requirements. Lecs. R 11:15; drills. T R 10:10. Staff. Readings in modern expository prose with Cantonese pronunciation.

201–202 Intermediate Chinese 201, fall or summer; 202, spring or summer 4 credits each term. Prerequisite: for Chinese 201, Chinese 102 or equivalent; for Chinese 202, Chinese 201. M–F 9:05 or 11:15. Staff.

211–212 Intermediate Cantonese 211, fall; 212, spring 4 credits each term. Prerequisite: Cantonese 112 or permission of instructor. Hours to be arranged. Staff.

301–302 Advanced Chinese 301, fall; 302, spring. 4 credits each term. Prerequisites: for Chinese 301, Chinese 202 or equivalent; for Chinese 302, Chinese 301. MWF 11:15. Staff. Readings and drill in modern expository Chinese.

303–304 Chinese Conversation 303, fall; 304, spring. 1 credit each term. May be repeated for credit. Prerequisites: Chinese 201–202–205, S–U grades only. T R 1:25. Staff. Guided conversation and oral composition and translation. Corrective pronunciation drill.

311–312 Advanced Cantonese 311, fall; 312, spring. 4 credits each term. Prerequisite: Cantonese 212 or permission of instructor. Not offered 1986–87. Hours to be arranged. Staff.

401 History of the Chinese Language Fall or spring, according to demand. 4 credits. Prerequisite: permission of instructor. Hours to be arranged. Staff. Survey of phonological and syntactic developments in Chinese.

403 Linguistic Structure of Chinese I Fall or spring, according to demand. 4 credits. Prerequisite: permission of instructor. Offered alternate years. Hours to be arranged. Staff. Introductory course in the phonology of modern Mandarin Chinese.

404 Linguistic Structure of Chinese II Fall or spring, according to demand. 4 credits. Prerequisite: permission of instructor. Hours to be arranged. J. Huang. Syntax of modern Mandarin Chinese.

405 Chinese Dialects Fall or spring, according to student demand. 4 credits. Prerequisite: permission of instructor. Hours to be arranged. Staff. Introductory survey of modern dialects and their distinguishing characteristics.

411–412 Readings in Modern Chinese 411, fall; 412, spring. 4 credits each term. Prerequisite: Chinese 302 or equivalent. MWF 1:25 or 3:35. Staff.

413–414 Chinese Reading Tutorials 413, fall; 414, spring 2 credits each term. May be repeated for credit. Prerequisite: Chinese 302 or equivalent and permission of instructor. Hours to be arranged. Staff. Individual or small-group guidance in advanced Chinese texts, designed primarily for Asian studies majors taking other courses with reading assignments in Chinese.

607 Chinese Dialect Seminar Fall or spring, on student demand. 4 credits. Prerequisite: Chinese 405 and permission of instructor. Hours to be arranged. Staff. Analysis and field techniques in a selected dialect area.

FALCON

161–162 Intensive Mandarin Course 161, fall; 162, spring. 16 credits each term. Prerequisite: for Chinese 161, Chinese 160 (Cornell summer intensive course) or permission of instructor; for Chinese 162, Chinese 161. M–F 6 hours each day. C. Sheehan. Foreign language requirement: Proficiency is attained by passing 161.

Literature

213–214 Introduction to Classical Chinese 213, fall; 214, spring. 3 credits each term. Prerequisite: qualification in Chinese or permission of instructor. May be taken concurrently with Chinese 101–102, 201–202, 301–302. 213: MWF 12:20–2:14: hours to be arranged. T. L. Mei and staff.

[313 Chinese Philosophical Texts Fall or spring, on demand 4 credits. Prerequisite: Chinese 214. Not offered 1986–87. T. L. Mei.]


420 "T'ang and Sung Poetry Fall or spring, on demand 4 credits. Prerequisite: permission of instructor. T. L. Mei. Hours to be arranged.

421–422 Directed Study Fall or spring or both. 2–4 credits each term. Prerequisite: permission of instructor. Staff.

[424 Readings in Literary Criticism Fall or spring, on demand. 4 credits. Prerequisite: permission of instructor. Not offered 1986–87. T. L. Mei.]

[430 Readings in Folk Literature Fall or spring, on demand. 4 credits. Prerequisite: permission of instructor. Not offered 1986–87. Staff.]

Note: For complete descriptions of courses numbered 600 or above, consult the appropriate instructor.

[603 Seminar in Chinese Poetry and Poetics Fall or spring, on demand 4 credits. Prerequisite: permission of instructor. Not offered 1986–87.]

605 Seminar in Chinese Fiction and Drama Fall. 4 credits. Prerequisite: permission of instructor. E. M. Gunn.

609 Seminar in Chinese Folk Literature Fall or spring, according to demand. 4 credits. Prerequisite: permission of instructor. Staff.

621–622 Advanced Directed Reading 621, fall; 622, spring. Credit to be arranged. Prerequisite: permission of instructor. E. J. Gunn, T. L. Mei.

Dutch

131–132 Elementary Course 131, fall or summer; 132, spring or summer. 3 credits each term. Prerequisite: permission of instructor. Hours to be arranged. F. van Coetsem.

Seminar in Dutch Linguistics (German 740)

English

Intensive English Program, see p. 229.

205 English as a Second Language Fall. 4 credits. Prerequisite: placement by the instructor. MWF 10:10. M. Martin. Intermediate spoken and written English, with emphasis on speaking, understanding, and reading.

206 English as a Second Language Spring. 3 credits. Prerequisite: English 205 or placement by the instructor. MWF 10:10. M. Martin. Designed for those who have completed English 205 and who require or desire further practice. Emphasis is on developing control of written as well as spoken language.

209 English as a Second Language Fall or spring. 1 credit. Prerequisite: placement by instructor. Hours to be arranged. M. Martin. Practice in informal conversational English. Pronunciation, techniques for gathering information, informal conversation, and classroom speaking. Students also practice giving informal presentations. Personal conferences with the instructor supplement class work.

210 English as a Second Language Spring. 1 credit. Prerequisite: placement by instructor. Hours to be arranged. M. Martin. Practice in academic speaking. Formal classroom discussion techniques and presentation of information in various forms. Personal conferences supplement class work.

211–212 English as a Second Language 211, fall, spring, or summer. 212, spring. 3 credits each term. Prerequisite: placement by the instructor. 211: MWF 9:05, 11:15; 2:30; TR 2:30–4. 212: MWF 9:05, 11:15, TR 2:30–4. E. Campbell. Advanced reading and writing, with emphasis on improving vocabulary, grammar, and control of college-level written English.

213 Written English for Nonnative Speakers Spring. 3 credits. Prerequisite: placement by the instructor. TR 10:10, plus a weekly conference. M. Martin. Designed for those whose writing fluency is sufficient for them to carry on regular academic work but who feel the desire for refining and developing their ability to express themselves clearly and effectively. As much as possible, students receive individual attention.

Freshman Seminar

215–216 English for Later Bilinguals 215, fall or summer; 216, spring. 3 credits each term. Not designed for students whose schooling has been mostly in English. Prerequisite for English 216: English 215.

MWF 2:30. M. Martin.
A course designed to strengthen the English-language skills of students from other countries who have studied for one to five years in American high schools, whose language in the home is not English. Intensive work in written English is offered, with emphasis on sentence structure, cohesion, vocabulary expansion, grammatical structure, and maturity of style. Individual conferences on papers supplement class work.

**French**


**The Major**

The major in French is designed to give students proficiency in the oral and written language, to acquaint them with French literature and culture, and to develop skills in literary and linguistic analysis.

While prospective majors should try to plan their programs as far ahead as possible, no student will be refused admission merely because of a late start. It is even possible for a student to begin French at Cornell and become a major. Students wishing to major in French should consult the director of undergraduate studies of the Department of Romance Studies, Professor J. Béraud, who will admit them to the major. After their admission students will choose an adviser from among the French faculty. Students interested in the linguistics option should consult Professor L. Waugh, Department of Modern Languages and Linguistics.

The major has a core, required of all majors, and two options that attempt to reflect the variety of student interests yet maintain the focus for a coherent and substantial program of studies.

**The Core**

1) All majors are expected to acquire a sound degree of competence in language. This competence is demonstrated by the successful completion of French 312 or by passing a special examination to be taken no later than the end of the sophomore year. A typical program will involve two semesters of language at the 200 level (to be taken no later than the end of the sophomore year) and two semesters of language at the 300 level (French 311/312). Students may bypass any part of the sequence through placement examinations.

2) In addition, all majors are expected to take French 201 and 202. At least one of these should be completed successfully no later than the end of the sophomore year.

**The Options**

The following groups intentionally overlap in part, yet each is intended to emphasize different aspects of French culture.

The literature option

1) The successful completion of six courses in French literature or civilization at the 200 level or above. These courses will be selected in consultation with the student's major adviser and will normally include at least one course from each of the three major periods of French literature (medieval to Renaissance, the seventeenth and eighteenth centuries, and the nineteenth and twentieth centuries).

2) The successful completion of two related courses in one of the following: (a) French literature; (b) French linguistics; (c) French history, culture, music, or history of art or architecture; (d) courses in linguistic theory, history of language, psycholinguistics, or philosophy of language.

The linguistic option

1) The successful completion of six courses in French and general linguistics (in addition to Linguistics 101 – 102). These courses will include at least one course concerned with the structure of French (e.g., French 401, Romance Linguistics 321) and one course concerning the structure of French (e.g., French 408, 410, or 602).

2) The successful completion of two courses (preferably a sequence) in some allied area, for example, (a) French literature and civilization, (b) psycholinguistics, (c) philosophy of language, (d) anthropological linguistics.

Whatever option a student chooses, he or she is urged to take advantage of the ample flexibility offered by the French major. Students who wish to pursue careers in business, law, medicine, or teaching may coordinate their work with preprofessional programs. Similarly, interdisciplinary work is strongly encouraged; students may elect to enrich their major with related courses in history, philosophy, government, linguistics, and other literatures and disciplines.

French majors may study in France for a semester or a year during their junior year under any of the several study-abroad programs that are recognized by the Department of Romance Studies and the Department of Modern Languages and Linguistics and allow for the transfer of credits. Interested students are urged to plan their studies with the director of undergraduate studies of the Department of Romance Studies, Professor J. Béraud, for placement in the appropriate French course.

**Honors**

The honors program encourages well-qualified students to do independent work in French, outside the structure of courses. The preparation of the senior honors essay, generally spread over three terms, provides a unique learning opportunity, since it allows for wide reading, careful outlining, and extensive rewriting to a degree not practically possible in the case of course papers. At each stage of their work, the students will have regular weekly meetings with faculty tutors.

No special seminars or courses are required of honors students. For literature majors, the junior (ordinarily two terms) will be devoted to intensive study of selected problems or authors and to the choice of a topic for the honors essay; the senior tutorial is devoted to the writing of the essay. Honors students may be released from one or two courses in either the junior or senior year to have adequate time for honors work. (Credit is obtained by enrolling in French 419-420.)

Students will take an informal oral examination at the end of the senior year. Honors students are selected on the basis of their work in French language and literature courses in the freshman and sophomore years. Students interested should consult Professor E. Morris for details no later than the spring term of the sophomore year, and earlier if possible. For linguistics majors, honors work in French linguistics will be supervised by Professor L. Waugh; normally, honors work is done in the senior year.

**Fees.** Depending on the course, a small fee may be charged for copies of texts for course work.

**Language and Linguistics**

**121–122 Elementary Course**

- Fall, 122, spring.
- 4 credits each term.
- Intended for beginners or students placed by examination. Prerequisite for French 121 or French 121 or equivalent. Students who obtain a CPT score of 500 after French 121 or 122 attain qualification and may enter the 200-level sequence; otherwise French 123 is recommended. Prerequisite: French 121 or French 121 or equivalent.
- Lec, R 9:05, 10:10, 11:15, or 1:25; drills, M T W F 8, 9:05, 10:10, 11:15, or 1:25; 2, 2:30; 3, 3:35. N. Gabriel. A thorough grounding in all the language skills is given: listening, speaking, reading, writing. Language practice is in small groups. Lectures cover grammar, reading, and cultural, and historical.

**123 Continuing French**

- Fall, spring, or summer.
- 4 credits. Limited to students who have previously studied French and have a CPT achievement score between 450 and 559. Satisfactory completion of French 123 fulfills the qualification portion of the language requirement.
- Lec, T 10:10 or 12:20; drills, M W R F B 9:05, 10:10, 11:15, 12:20, 1:25, 2:30, or 3:35. S. A. Littauer. An all-skills course designed as the final course in the sequence. A review of grammar is included in addition to reading, writing, and conversation.

**200 Intermediate Course:**

- Fall or spring. 3 credits. Prerequisite: qualification in French with a CPT score no higher than 629. Offered by the Department of Romance Studies.

- Designed to provide an introduction to contemporary French culture and literature. Texts read and discussed are selected for their cultural and humanistic value.

**203 Intermediate Composition and Conversation**

- Fall, spring, or summer. 3 credits. Prerequisite: qualification in French.

- Emphasis on conversation. Weekly grammar review in addition to composition. Taught in French.

**204 Intermediate Composition and Conversation**

- Fall or spring. 3 credits. Enrollment limited.
- Prerequisite: French 203 or 211 with a grade of C or better or consent of instructor, or placement by Cornell Advanced Standing Examination (CASE) offered by the Department of Modern Languages and Linguistics.

**210 Intermediate French Conversation**

- Fall or spring. 2 credits. Limited to 15 students.
- Prerequisite: French 203 or 211 or equivalence (Q + ) on the Cornell Advanced Standing Examination (CASE).

- The course is based on audiovisual materials used in class; slides and recordings will accompany extensive discussions. A modest amount of reading each week will aim at increasing students' active vocabulary.

**211–212 Intermediate French**

- 3 credits each term.

**310 Advanced French Conversation**

- Spring. 2 credits. Limited to 15 students. Priority given to seniors. Prerequisite: French 204 or 212 or Cornell Advanced Standing Examination (CASE) placement of Q + or better.
- 2:30-3:45. J. Béraud and staff.

- This course is based on discussion of articles published in the French press (L'Express magazine). A few recordings and films will also be used.

**311 Advanced French**

- Fall. 4 credits. Prerequisite: French 204 or 212 or placement by the Cornell Advanced Standing Examination (CASE).
- M W F 10:10 or 11:15. J. Béraud and staff.

- All-skills course. Detailed study of present-day syntax. Reading and discussion of texts of cultural relevance. Weekly papers.
109 Freshman Seminar: Techniques of Interpretation: An Introduction to Semiotics (also Romance Studies 109) Fall or spring. 3 credits. M W F 9:05 or 1:25. Staff. In its broadest meaning semiotics is the study of signs that carry information: roadside signs, fashions, advertisements, publicity posters, literary modes. This course, which does not presuppose prior technical knowledge, will introduce the students to a critical reading of signs: the signifier (the concrete expression of the sign) and the signified (the message) and their various interactions. Exercises will be essays on how to analyze various signs taken from practical experience, such as advertisements from magazines or TV or from cultural phenomena (fashion codes, artistic modes).

201 Introduction to French Literature Fall, spring, or summer 3 credits. Prerequisite: Qualification in French. French 201 serves as a prerequisite for all 300-level courses in French literature and is required of all majors. The course is divided into small sections. Some are taught entirely in French; the others will use English and as much French as the language proficiency of the students will allow. (For times of the all-French sections, see the supplemental course description available in Goldwin Smith 283.) Readings for all sections are the same and all in French. Papers may be written in French or in English.

Fall: M W F 9:05, 10:10, 12:20, or 1:25, or T R 8:40–9:55, 10:10–11:25, or 12:20–1:35. Spring: M W F 9:05, 11:15, 12:20, or T R 10:10–11:25 or 12:20–1:35. Staff. Stress is on the development of reading skills and, more generally, on cultural, sociological, and aesthetic implications of the texts. Reading will include works of nineteenth- and twentieth-century authors such as Balzac, Flaubert, Sartre, Camus, and Beckett.

202 Studies in French Literature Fall or spring. 3 credits. Prerequisite: French 201 or permission of instructor. Offered alternate years. Fall: M W F 1:25. Spring: M W F 12:20 or T R 12:20–1:35. A. Berger and staff. Study of the classic literature of seventeenth-century France (Corneille, Racine, Molère, Madame de Lafayette) and its immediate forebears (Montaigne) and successors in the Enlightenment (Voltaire, Rousseau, Diderot, Beaumarchais). Special attention will be paid to the connections between classicism and humanist trends.

309 Mystery and the Mystery Story (also Comparative Literature 309) 4 credits. Not offered 1986–87.

320 French Civilization Fall. 4 credits. Prerequisite: a good command of French (typically taken after French 204 or 212). Conducted in French.

M W F 12:20. J. Béreau. Study of contemporary France: its resources, institutions, culture, and attitudes. Students will be expected to research topics for papers and oral presentation. Audiovisual materials will be used.


332 Masterpieces of French Drama II: The Comic in the Modern Era Fall. 4 credits. T R 10:10–11:25. D. Grossvogel. The history of French theater is followed from romanticism to the present, with emphasis on theatrical experiments in the twentieth century. Plays to be studied will be chosen from works by such authors as Hugo, Musset, Jarry, Claudel. Giraudoux, Cocteau, Sarthe, Beckett, Ionesco.


335 Romance to Revolution: The French Novel before 1789 Spring. 4 credits. Prerequisite: French 201 or permission of instructor. Conducted in French.

M W F 1:25. P. Lewis. In addition to considering formal questions relating to the development of the novel in French, this course will examine problems such as the appearance of narrative and historical consciousness, the representation of woman, and the relation between literature and society. Texts read will include those of such major writers as Rabelais, Montaigne, Mme de Lafayette, Prévoix, Rousseau, Diderot, and Sade.


362 Poems, Institutions, and Other Fictions in the Realm of Francis the First (also History 362) 4 credits. Not offered 1986–87.


389 French Romanticism Fall. 4 credits. Taught in French.

M W F 11:15. N. Furman. The history and literature of the French romantic period will be studied through the works of Stendhal, Hugo, Vigny, Nerval, and Balzac.

390 Modern French Criticism (also French 690) 4 credits. Not offered 1986–87.


396 The Contemporary French Novel: 1950 to the Present Spring. 4 credits. M W F 11:15. S. Tarrow. Uses of comic writing in the French postwar novel to achieve existential irony, black humor, surrealistic fun, social satire, etc., by such authors as Gide, Sarthe, Camus, Buto, Queneau, Sarraute, Robbe-Grillet, Viau, and others.

404 Cogito Ergo Sum: Thought and Existence from Descartes to Sartre (also Comparative Literature 404 and Romance Studies 404) 4 credits. Not offered 1986–87.

419–420 Special Topics in French Literature 419, fall; 420, spring. 2–4 credits each term. Prerequisite: permission of instructor. Staff.

Guided independent study of special topics.
[424] Composition and Style  Fall. 4 credits. Taught in French. M.W.F 2:30. J. Béreaud. Designed primarily for graduate students and for undergraduates who have advanced beyond the level of French 312, this course is intended to promote a more nuanced and analytic general competence in both written and oral expression. Students will be assigned weekly papers, either translations into French or pastiches, and will occasionally present oral explications de textes in class. Selected readings in the area of stylistics will be discussed, and their applicability to the analysis of some literary texts will be tested.

[429-430] Honors Work in French  4 credits each term, with permission of the advisor. Open to juniors and seniors. Consult the director of the honors program, Professor P. Lewis.

[447-448] Medieval Literature  447: fall; 448: spring. 4 credits each term. Prerequisite: French 201 or permission of instructor. First term not prerequisite to the second. M.W.F 9:05. A. Colby-Hall. French 447 deals with the epic and the theater, 448 with the romance and the lyric. Facility in reading Old French and appreciation of these four major genres are the primary goals of this course.


[460] The Moralist Tradition (also French 660)  Fall. 4 credits. Taught in French. T 2:30-4:25. P. Lewis. What allows us to posit a moralist intertext that is rearticulated in the works of major seventeenth-century writers? This course will address the responses of four major figures in the history of French classicism—Descartes, Pascal, La Bruyère, and La Rochefoucauld—to a wide range of problems that they encounter in the work of Montaigne. Critical readings will include essays by Derrida, Nancy, de Man, and Marin that deconstruct key arguments in Descartes and Pascal by interrogating the opposition of the philosophical to the literary.


[470] Perspectives on the Age of Enlightenment  Fall. 4 credits. Taught in French. M.W.F 1:25. A. Berger. This course will concentrate on various aspects of the ideological and epistemological breaks (gathered under the name of "Lumières"), that occur in the eighteenth century. We will examine the new "genres," connections, representations, and practices of French philosophy and literature through the study of some major writers. Particular emphasis will be given to the reading of early eighteenth-century and prerevolutionary drama. We will try to see art, not only the effects of the social drama, but also the decisive shift on the question of representation itself. Readings will include Marivaux, Voltaire, Diderot, Rousseau, and Beaumarchais.


[488] Baudelaire  Spring. 4 credits. Prerequisite: one 300-level course in French literature or permission of instructor. Taught in French. T 2:30-4:25. E. Morris. Reading and discussion of poems from Les Fleurs du mal and the Petits poèmes en prose, centered on a critical re-examination of the concepts prose, poetry, and song in mid-nineteenth-century France. Excursions into the theory of versification and phonetics and into the theory of genres. Class reports and two papers.

[493] French Feminisms (also Women's Studies)  Spring. 4 credits. T R 12:20-1:35. N. Furman. This course will examine the political, theoretical, and literary concerns of contemporary French feminist writers. Readings will include representative texts by Simone de Beauvoir, Marguerite Duras, Luce Irigaray, Monique Wittig, and Hélène Cixous.

[498] Dostoevskiy, Mann, and Gide (also Comparative Literature 498)  Fall. 4 credits. W 3:35-5:30. W. Holdein. The development of the novel form and of certain important modern themes, as illustrated in some of the chief works of these three representative authors. Among others, Notes from the Underground, The Brothers Karamazov, Doctor Faustus, L'Atlæcide, Adventures, and The Counterfeiters will be discussed.

[506] Proseminar  Spring. 4 credits. First-year graduate students are required to take this course, but may elect to do so as auditors. Prerequisite: fluency in French. R 4-6. N. Furman.


[638] Historical French Phonology  Spring. 4 credits. Useful background: French 401, French 447, or similar instruction. M:230-4:25. A. Colby-Hall. An in-depth study of the phonological changes in the French language from the ninth century to the seventeenth. Special attention will be given to the development of the meter and of the prosodic systems of the language that are of concern to students of literature, such as the identification of sound effects in early French texts, artificial literary languages in the Middle Ages, and the linguistic dating of texts on phonological grounds.


[660] The Moralist Tradition (also French 460)  Fall. 4 credits. T 2:30-4:25. P. Lewis. For description see French 460.


[694] Surrealism  Spring. 4 credits. W 2:30-4:25. A. Berger. The course will focus on several important examples of surrealist writing in France, including texts by Eluard, Breton, Leiris, and Artaud. Their work will be read against the background of the doctrines enunciated by Breton in the two surrealist manifestos, with special attention to their use of Marx and Freud. References to surrealist art and painting will be frequent.

German Studies

Students majoring in German are encouraged to design their programs in a manner that will allow for diversity in their courses of study. It should enable them to become acquainted with an adequate selection of major works, authors, and movements of German literature and to develop their skill in literary analysis. Students majoring in German will normally proceed through German 201, 202, 203, 204. Students who, because of previous training, are qualified to enroll in 300- or 400-level courses, will be permitted to do so. For details, students may consult the major advisers, H. Deinert, in the Department of German Literature, or H. L. Kufner, in the Department of Modern Languages and Linguistics. Students majoring in German are expected to complete successfully a minor in German and a minor in another discipline. The attention of students majoring in German is called to the courses offered by departments and programs such as Comparative Literature, History, History of Art, Government, Music, Society for the Humanities, Theatre Arts, and Women's Studies, many of which complement the course offerings in German.

Students majoring in German are expected to become competent in the German language. This competence is normally demonstrated by the successful completion of German 304. Placement of German majors who have done no work in German at Cornell will be determined by the level of preparation they have obtained elsewhere. For information, students should consult the major advisers, H. Deinert or H. L. Kufner.

Study Abroad

All German majors, particularly those who have had no German prior to coming to Cornell, are encouraged to spend at least part of their junior year abroad.

German Area Studies Major

The German area studies major is intended for students who are interested in subject matter related to German-speaking countries but not necessarily or not exclusively in German literature or linguistics. Students will select appropriate courses offered in history, government, economics, music, theater arts, or other suitable subjects. These students will select a committee of two or more faculty members to help them design a program and supervise their progress. One committee member must be from the German faculty of either the Department of Modern Languages and Linguistics or the Department of German Literature. The other member(s) should represent the student's main area of interest.
The student majoring in German area studies is expected to become competent in the German language. Such competence is normally demonstrated by successful completion of German 304. A minimum of six area courses above the 200 level is required for the major.

Students coming to Cornell with advanced standing in German and/or another subject often find it possible to complete two majors. Recent double majors have combined history and German, psychology and German, chemistry and German, and biology and German.

Honors. The honors program in German is open to superior students who wish to work independently in an area of their own choice. Students are free to select any faculty member of the Field of Germanic Studies (in the case of area studies majors, the appropriate member of their committee) to assist them in designing their honors program, to supervise their work, and to help them select a suitable topic for an honors essay. The independent study courses, German 451 and 452, may form part of the program.

Freshman Seminar Requirement

The following courses will satisfy the Freshman Seminar Requirement: German 109, 151, 211, and 312. For details students should consult the instructors.

Fees. Depending on the course, a small fee may be charged for photocopied texts for course work.

Languages and Linguistics

121–122 Elementary Course 121, fall or summer; 122, spring or summer. 4 credits each term.
Prerequisite for German 122: German 121 or equivalent. Intended for beginners or students placed by examination. Students who obtain a CPT score of 400 or better after German 121–122 attain qualification and may enter the 200-level sequence; otherwise German 123 is required for qualification.
Lec, T 9:05, 11:15, or 1:25; drills, M W R F 8, 10:10, 12:20, 1:25, or 2:30. H. L. Kufner.
A thorough grounding in all the language skills is given: listening, speaking, reading, and writing. Language practice is in small groups. Lectures cover grammar, reading, and cultural information.

123 Continuing German Fall, spring, or summer. 4 credits. Limited to students who have previously studied German and have a CPT achievement score between 450 and 559. Satisfactory completion of German 123 fulfills the qualification portion of the language requirement.
An all-skills course designed to prepare students for study at the 200 level.

203 Intermediate Composition and Conversation Fall, spring, or summer. 3 credits. Prerequisite: qualification in German.
Fall: M W F 9:05, 10:10, 11:15, or 1:25, Spring: M W F 9:05, 10:10, or 1:25. Staff.

204 Intermediate Composition and Conversation Fall or spring. 3 credits. Prerequisite: German 203 or permission of instructor.
Fall: M W F 10:10. Spring: M W F 10:10, 11:15, or 1:25. Staff.

303–304 Advanced Composition and Conversation 303, fall, 304, spring. 4 credits each term. Prerequisite for German 303: German 204 or equivalent. Prerequisite for German 304: German 303 or equivalent.
Fall: M W F 11:15 or 1:25, Spring: M W F 11:15. Staff. Emphasis is on increasing the student's oral and written command of German. Detailed study of present-day syntax and different levels of style.

306 Zeitungsgdeutsch Spring. 4 credits.
Prerequisite: German 304 or equivalent.
M W F 11:15. E. Augsberger.

401 Introduction to Germanic Linguistics Fall. 4 credits.
Prerequisite: Linguistics 101 or permission of instructor. Offered alternate years. Not offered 1986–87.
Hours to be arranged. F. van Coetsem.
A survey of major issues in Germanic linguistics, with emphasis on historical and dialectal problems.

402 History of the German Language Spring. 4 credits.
Prerequisite: German 204 and Linguistics 101 or permission of instructor. Offered alternate years. Not offered 1986–87.
Hours to be arranged. F. van Coetsem.
A thorough grounding in all the language skills is given: listening, speaking, reading, and cultural information.

403 Modern German Phonology Fall. 4 credits.
Prerequisites: German 304 or equivalent, and Linguistics 101 or 301. Not offered 1986–87.
Hours to be arranged. F. van Coetsem.
The phonological system of German is viewed from various theoretical approaches.

404 Modern German Syntax Spring. 4 credits.
Prerequisite: German 304 or equivalent, and Linguistics 101 or 303.
Hours to be arranged. W. E. Harbert.
An application of selected theoretical syntactic models to problems in the syntax of modern German.

405 German Dialectology Spring. 4 credits.
Prerequisite: German 304 or equivalent, and Linguistics 101 or equivalent. Not offered 1986–87.
Hours to be arranged. H. L. Kufner.
Survey of German dialects, the work done at the Sprachatlas, and a discussion of modern approaches to dialectology.

406 Runology Fall. 4 credits.
Prerequisite: German 401.
Hours to be arranged. F. van Coetsem.
A thorough grounding in all the language skills is given: listening, speaking, reading, and writing. Language practice is in small groups. Lectures cover grammar, reading, and cultural information.

407 Applied Linguistics: German Fall. 4 credits.
Study of the inscriptions in the older futhark and their relevance to historical Germanic linguistics.

408 Linguistic Structure of German Spring. 4 credits.
Prerequisites: German 204 and Linguistics 101 or equivalent. Not offered 1986–87.
Hours to be arranged. H. L. Kufner.
A descriptive analysis of present-day German, with emphasis on phonology and syntax.

602 Gothic Spring. 4 credits.
Prerequisite: Linguistics 101.
Hours to be arranged. F. van Coetsem.
Linguistic structure of Gothic, with extensive readings of Gothic texts.

603 Old High German, Old Low Franconian Fall. 4 credits.
Prerequisite: Linguistics 102. Offered alternate years.
Hours to be arranged. F. van Coetsem.
Study of the phonological system of Old German.

604 Old Saxon, Old Frisian Spring. 4 credits.
Hours to be arranged. F. van Coetsem.
Linguistic structure of Old English, with emphasis on phonology and syntax.

605 Structure of Old English Fall. 4 credits.
Prerequisite: German 401. Not offered 1986–87.
Hours to be arranged. W. E. Harbert.
Linguistic structure of Old English, with emphasis on phonology and syntax.

606 Topics in Historical Germanic Phonology Fall. 4 credits.
Prerequisite: German 401. Not offered 1986–87.
Hours to be arranged. F. van Coetsem.
The development of the sound system from Proto-Germanic to its daughter languages.

607 Topics in Historical Germanic Morphology Fall. 4 credits.
Prerequisite: German 401.
Hours to be arranged. J. Jasanoof.
The Germanic verbal system and its Indo-European origins.

608 Topics in Historical Germanic Syntax Fall. 4 credits.
Prerequisite: German 401. Not offered 1986–87.
Hours to be arranged. W. E. Harbert.
A diachronic and comparative investigation of syntactic processes in the older Germanic languages.

609–610 Old Norse Fall. 610. Fall: 610. Spring. 4 credits each term.
Hours to be arranged. T. Hill.
Study of the linguistic structure of Old Norse, with extensive reading of Old Norse texts.

611 Readings in Old High German and Old Saxon Spring. 4 credits. Not offered 1986–87.
Hours to be arranged. J. Jasanoof.
A thorough grounding in all the language skills is given: listening, speaking, reading, and writing. Language practice is in small groups. Lectures cover grammar, reading, and cultural information.

612 Germanic Tribal History Spring. 4 credits.
Prerequisite: German 401.
Hours to be arranged. F. van Coetsem.
The history of the Germanic tribes from about 500 B.C. to A.D. 500; introduces the study of Proto-Germanic and the separation of the Germanic languages.

631–632 Elementary Reading I 631, fall or summer. 632. Spring or summer. 3 credits each term.
Limited to graduate students. Prerequisite for German 632. German 631 or equivalent.
Hours to be arranged. D. McGraw.
A descriptive analysis of present-day German, with emphasis on phonology and syntax.

710 Seminar in Germanic Linguistics Fall or spring, subject to the needs of students and the limitations of staff time. 4 credits.
Hours to be arranged. Staff.

720 Seminar in Comparative Germanic Linguistics Fall or spring, subject to the needs of students and the limitations of staff time. 4 credits.
Hours to be arranged. Staff. Selected topics including the history, structure, and dialectology of the Germanic languages.

730 Seminar in German Linguistics Fall or spring, subject to the needs of students and the limitations of staff time. 4 credits. Not offered 1986–87.
Hours to be arranged. Staff.
Selected topics including the history, structure, and dialectology of the Germanic languages.

740 Seminar in Dutch Linguistics Spring. Subject to the needs of students and the limitations of staff time. 4 credits. Not offered 1986–87.
Hours to be arranged. F. van Coetsem.
Selected topics including the history, structure, and dialectology of modern Dutch.
Literature

Freshman Seminars

109 Folk Tales and Folk Poetry Fall and spring. 3 credits each term. M W F 9:05, 10:10, 11:15, or 12:20, or T R 9:40–10:55. I. Ezergailis and staff. Discussion and analysis of various types of folk literature from primitive legends, myths, and ballads to contemporary literary tales. Aims to develop reading skills that can be redirected to the student's own literary interests. Readings (in English translation) range from Grimm's Fairy Tales to stories by J. R. R. Tolkien.

151 Kafka, Hesse, Brecht, and Mann Fall and spring. 3 credits each term. M, T 10:10; secs, W 10:10 or T R 12:20–1:10. H. Deinert and staff. This course will be based on complete works (in English translation) by four representative German authors of the first half of the century. Although dealing with works of great popular appeal (Derrnan, Siddhartha, Death in Venice, The Metamorphosis, Mother Courage, Galileo, and others), the emphasis of the course will be on improving writing skills. We will meet once a week for a combined lecture. In addition, there will be regular conferences between students and their instructors to discuss the papers.

Courses Offered in German

201 Introduction to German Literature I Fall and spring. 3 credits each term. Prerequisite: qualification in German or permission of instructor. Taught in German. Fulfills both the language proficiency requirement and, followed by German 202, the humanities distribution requirement. Fall: M W F 12:20 or T R 12:20–1:35; spring: M W F 12:20. C. A. Martin and staff. An intermediate course designed to improve reading, writing, speaking, and listening skills in German. Emphasis is placed on developing reading competency, tools of literary analysis, and expansion of vocabulary. Grammar review included. Readings from major twentieth-century authors, including Brecht, Duerrenmatt, Frisch, Aichinger, Bachmann, Musil, and Kafka.

202 Introduction to German Literature II Fall and spring. 3 credits each term. Prerequisite: German 201 or permission of instructor. Taught in German. Fall: T R 12:20–1:35; spring: M W F 12:20 or T R 12:20–1:35. L. M. Otschner and staff. An intermediate course emphasizing skills in reading and interpreting German literature, using representative texts of major nineteenth-century authors. Included will be discussions of the drama (Kleist, Buehner), lyric poetry (Goethe, Heulerin, the Romantics, Heine), the essay (Kleist, Heine, Marx), and the novelita (Kleist, Buechner, Keller, Moerike).

211 Intensive Workshop in Germanic Studies for Freshmen I Fall. 6 credits. Intended for entering freshmen with extensive training in the German language (CPT achievement score of 650 or comparable examination; please consult instructor) Taught in German. Satisfies the language and distribution requirements or the Freshman Seminar requirement. T R 2:30–4:30. H. Deinert. Not intended as a survey but rather as a rigorous seminar designed to familiarize students with literary forms and the tools of critical analysis. The course will provide an intensive introduction to the study of German literature through the discussion of exemplary prose, works, dramas, and poems from the eighteenth century to the present.

295 Modern German Poetry Fall. 4 credits. Prerequisite: German 202 or equivalent. Taught in German. T R 10:10–11:25. L. M. Otschner. Introduction to the history of postwar Germany, the development of the two Germanies, and their societies.

The emphasis is on cultural and social institutions such as mass media, educational systems, and political parties. Students will have the opportunity to practice their spoken and written German.

312 Intensive Workshop in Germanic Studies for Freshmen II Spring. 4 credits. May be used to satisfy the Freshman Seminar requirement. Taught in German. T R 2:30–4:45. H. Deinert. Designed primarily as a sequel to German 211. Emphasis is on German literature since 1900 (T. Mann, Hesse, Kafka, Brecht, Duerrenmatt, Peter Weiss, Plenzdorf, Rilke, Benn, Celan). Supplementary reading from contemporary philosophy, psychology, sociology, and political theory.

354 Schiller Spring. 4 credits. Prerequisite: German 201, 202, or permission of instructor. Taught in German. W 2:30–4:30. H. Deinert. A discussion of Schiller's dramas, selected poetry, and philosophical and aesthetic writing against the political and intellectual background of eighteenth-century Europe.

[355 The Age of Goethe Not offered 1986–87.]

[356 Goethe's Feast Not offered 1986–87.]

[357 Major Works of Goethe Not offered 1986–87.]

358 Romanticism Fall. 4 credits. Prerequisite: German 201–202 or permission of instructor. Taught in German. M W F 10:10. G. Waite. A systematic survey of texts of early German romanticism. We will focus primarily on a close reading of exemplary works but do so always with attention to the larger ideological, historical, and social contexts from which European literature of the late eighteenth and early nineteenth centuries emerged.

359 Heine and Büchner Spring. 4 credits. Prerequisite: German 201–202 or permission of instructor. Taught in German. T R 10:10–11:25. G. Waite. This course will introduce major themes and problems of early to mid nineteenth century German literature by way of a close, in-depth analysis of these two exemplary writers. Our special concern will be to discuss different modes of response by literature to the most pressing political and social issues of its day.

[360 Naturalism and Feminism Not offered 1986–87.]

[362 Modern German Literature II: Twentieth-Century Prose Not offered 1986–87.]

[363 Contemporary Literature Not offered 1986–87.]

[365 German Poetry of the Twentieth Century Spring. 4 credits. Prerequisite: German 201–202 or permission of instructor. Not offered 1986–87. M W F 10:10. L. Otschner. The seminar will focus on close readings of selected exemplary texts. George, Holmnnsthal, and especially Rilke will provide the foundations upon which aspects of tradition, modernism, avant-gardism, and hermeticism can be defined and differentiated. Expressionism, dada, surrealism, traditional and recent nature poetry, poetry from the right and left, holocaust poetry, poetry of Innerlichkeit, and concrete poetry are the areas of primary interest.]

374 Opera Fall. 4 credits. Prerequisite: good reading knowledge of German. M W F 12:20. A. Groos. The same as Music 274, but with occasional meetings directed to discussion of individual texts. (See also Music 374.)

[376 Contemporary Soviet Latvian Literature Fall. 4 credits. Prerequisite: permission of instructor. Taught in Latvian.]
349 Anti-Semitism in Germany and the Jewish Response (also Near Eastern Studies 349) Spring. 4 credits. Reading knowledge of German helpful, though the basic texts will be read in English. T R 2:30–3:45 S. L. Gilman. An overview of the history of German anti-Semitism from Luther to Hitler. Readings from political, theological, and literary texts ranging from the Church Fathers (as background to a reading of Luther) to the anti-Semitic literary novels of the nineteenth century to Mein Kampf. Parallel texts will be examined to judge the Jewish intellectual and literary response to evolving forms of German anti-Semitism.

[350 Yiddish Literature in English Translation Not offered 1986–87]

[377 Topics in Yiddish Literature Not offered 1986–87]

381 Marxist Cultural Theory (also Comparative Literature 281) Fall. 4 credits.

TR 12:00–1:15 W. Cohen, P. Hohendahl. A historical survey of leading European Marxist thinkers, offering a critical perspective on culture, particularly in relation to ideology. Mainly a close reading of selected texts but with consideration of historical contexts as well. Some emphasis on aesthetics and especially literary theory. Readings from Marx, Engels, Lukács, Gramsci, Brecht, Benjamin, Horkheimer, Adorno, Marcuse, Sartre, Althusser, and Williams.

[396 German Film (also Comparative Literature 396 and Theatre Arts 396) Spring. 4 credits. Requirements: participation in class discussion, one paper, midterm, and final. Not offered 1986–87.]

MWF 12:20; screening T 4:30. D. Bathrick. The goal of the course is to explore the form and context of German film in relation to the cultural and sociopolitical context of which it is a part. Accordingly, the material discussed will be divided into three major periods: Weimar film, 1919–1933; Nazi film 1933–1945; Postwar film, 1945–present. Readings and lectures will be devoted to formal and cultural developments in the history of German film as well as interpretive analysis of selected individual films. In both lectures and discussions, particular emphasis will be placed on helping students develop an appropriate method for viewing and analyzing films.

[399 Forms of Opposition: German Women Writers on the Nazi Period (also Comparative Literature 399 and Women's Studies 399) Not offered 1986–87]

[406 Introduction to Medieval German Literature II Fall. 4 credits. Prerequisite: German 405 or equivalent. Not offered 1986–87.]

MWF 9:05. A. Groos. The course will survey the classical period, emphasizing Walther von Eschenbach's Parzival, Gottfried von Strassburg's Tristan und Isolde, and major poets of the Minnesang, especially Walther von der Vogelweide.

[431 Goethe's Poetry Not offered 1986–87.]

[433 E. T. A. Hoffmann Not offered 1986–87.]

438 German Drama after 1945 Fall. 4 credits. Prerequisite: permission of instructor. Taught in German.

MWF 11:15. I. E. Zergalis. Reading of selected plays by post–World War II German-language playwrights from East and West such as Dürrenmatt, Frisch, Handke, Weiss, Heiner Müller, and Peter Hacks.

451–452 Independent Study 451, 452. Spring. 1–4 credits each term. Prerequisite: permission of instructor. Hours to be arranged. Staff.

Seminars

Note: For complete descriptions of courses numbered 600 above consult the appropriate instructor.

605 Introduction to Modern German Literary Theory with an Emphasis on Contemporary Criticism (also Comparative Literature 605) Fall. 4 credits.

R 2:30–4:25 P. U. Hohendahl. The seminar will offer a survey of German criticism from 1900 to the present. Emphasis will be placed on the period from 1945 to the present. The aim of the course is to familiarize primary graduate students with the main currents of German criticism. Readings will be taken from Heidegger, Staiger, Käte Hamburger, Sondzi, Adorno, Jauss, and others.

[611 Seminar in Old Icelandic Literature I (also English 602) Not offered 1986–87]

[612 Seminar in Old Icelandic Literature II (also English 612) Not offered 1986–87]

623 Seminar in Medieval German Literature (also Medieval Studies 601) Fall. 4 credits.


[624 Seminar in Medieval German Literature II Not offered 1986–87]

625 The Northern Renaissance and Reformation Spring. 4 credits.

M T 2:30–3:25 S. L. Gilman. Topic for 1987: disease and society in fifteenth- and sixteenth-century Germany. The course will center on the function of metaphors of disease in writers such as Erasmus, Luther, and Hutten and the relationship between these metaphors and the social perception of illness, especially the syphilis epidemics of the late fifteenth and early sixteenth centuries. Readings in German and Latin of major texts in intellectual and medical history.

[627 Baroque Not offered 1986–87]

[629 The Enlightenment Fall. 4 credits. Prerequisite: permission of instructor. Not offered 1986–87.]


632 Faust Fall. 4 credits. Prerequisite: permission of instructor. M T 1:25–3:25 G. Waite. An intensive analysis of parts I and II. Our task will be to combine techniques of close reading and attention to textual nuance with a concern for the history of the reception and appropriation of the text, including contemporary theory (e.g., hermeneutics, deconstruction, semiotics, feminism, and historical materialism).

[635 Backgrounds of German Realism Not offered 1986–87]

[636 Nineteenth-Century Poetry Not offered 1986–87]

[637 Seminar in Realism: Die Novelle Not offered 1986–87]

[638 Contemporary German Women Writers Not offered 1986–87]

[639 Modern Lyric Poetry Not offered 1986–87]

[641 The Modern German Novel Not offered 1986–87]

642 West German Literature, 1945–1970 Spring. 4 credits. Open to advanced undergraduates with permission of instructor. Taught in German.

W 1:25–3:25 L. Olschner. The seminar will emphasize source texts of all genres and analyze the cultural and political background leading to the production of texts that may be read as mimetic echoes or critical reactions to the emergence of postwar West Germany. The twenty-year history of the Gruppe 47 will provide the central frame of reference. The dubiousness or validity of terms such as Nullpunkt, Kalthoff, and Trümmerliteratur, the function, significance, and history of literary magazines in the late forties and fifties, attitudes and presuppositions of literary critics; the problem of Vergangenheitsbewältigung; and the role of literature in the public sphere are background areas that will add to an understanding of primary texts. Within this context the positions of Benn and E. Jünger will be examined, and paradigmatic texts by Böll, Grass, Johnson, Weiss, Enzensberger, and others will be interpreted in close readings.

660 Visual Ideology Spring. 4 credits. 1 T 3:35–5:35. G. Waite. Some of the most interesting and influential approaches to visual objects have come from the peripheries of traditional art history and criticism. This seminar will analyze some of these approaches so as to understand the interactions between the disciplines of art history and criticism and such fields as philosophy, psychoanalysis, film and literary theory, and sociology. More specifically, we will attempt to advance a dialectical interpretation of the ideological and sociopolitical determinations on the reciprocal production and consumption of visual artifacts. Readings taken from Althusser, Barthes, John Berger, Benjamin, Bryson, T. J. Clark, Freud, Gadamer, Carla Ginzburg, Hadjinicolaou, Hauser, Klingender, Kristeva, Lacan, Lenin, MacCabe, Marin, Marx, Nietzsche, Ortega, Plekhanov, Max Raphael, Sontag, and Wolin. Examples of artifacts for analysis will be drawn primarily from the history of oil painting, but we will discuss other types as well, including photography and cinema.

[879 Bertolt Brecht in Context (also Comparative Literature 679 and Theatre Arts 679) Spring. 4 credits. Requirements: seminar paper that will form the basis for an oral presentation for class discussion. Not offered 1986–87.]

M 2:30–4:30. D. Bathrick. Brecht's theory and dramatic praxis will be examined in the light of a two-fold context: (1) the relation of selected plays and writings to the historical contingencies of the Weimar and exile periods in which they emerged; (2) in later periods: an analysis of the reception and various readings of these same works by later writers and critical publics in West Germany, East Germany, and the United States as a way of understanding the changing nature of aesthetic values in the postwar period. Special attention will be given to the importance of Marxism for Brecht's art, as well as to the author's role as a representative of the cultural avant-garde.]

[683] Freud and the Fin de Siècle. Fall. 4 credits. Reading knowledge of German necessary. This course will be followed by a spring-semester tutorial on German women writers of the fin de siècle. Not offered 1986–87.

M 1:25–3:25, S. L. Gilman and C. A. Martin. A survey of major late nineteenth and early twentieth century works reflecting the adoption of the biological model as a central metaphor in German thought. Central to the course will be Freud’s early work (Studies in Hysteria, Interpretation of Dreams, Three Essays). Other writers to be read include Nietzsche, Haeckel, Andreas-Salomé, Wedekind, Hauptmann, Schnitzler, and Lombruso.


T 1:25–3:25, P. U. Hohendahl. The seminar will focus on the aesthetic writings of Adorno, beginning with relevant chapters from Dialektik des Ennschwellen, as well as selected essays on European literature and music. The emphasis then will be placed on Adorno’s major posthumous work, Aesthetische Theorie (1970). The aim is a close reading of Adorno’s theory in the context of the Kantian and Hegelian tradition.

690 Feminism and the Politics of Literary Theory (also Women’s Studies 690). Spring. 4 credits. Open to qualified undergraduates with permission of instructor. Reading knowledge of German recommended but not required.

T 1:25–3:25, C. A. Martin. This course is designed to explore developments in feminist literary theory with particular attention to the field of German literature. We will consider competing critical strategies and their political implications by working through different readings of specific literary texts and by raising questions about the implications for feminism of competing critical strategies in the general field of literary theory; the relations between feminism and established critical schools; the tension in feminist Germanistik between critical attention to the “male canon” and the construction of a female literary tradition; the impact of feminism on West and East German feminism(s) of their translations of French and American work; the impact and treatment of the Nazi period; the effects of the East-West divide on development in both Germanies; the impact on feminist literature and criticism of Third World women in Germany; and approaches in West and East Germany to imperialism and racism.

698 Gadamer’s Hermeneutics (also Comparative Literature 698). Fall. 4 credits. Open to qualified undergraduates with permission of instructor. Not offered 1986–87.

W 1:25–3:25, W. W. Holdheim. An intensive and systematic study of H. G. Gadamer’s work Truth and Method (in translation) will lead to an examination of such problems as the structure of humanistic and historical knowledge and its relations to theoretical knowledge, “objectivity” and “subjectivity” in interpretation, the role of the language in human existence, and the nature of the aesthetic phenomenon. Various intellectual trends will be located and evaluated in terms of an overall theory of understanding.


753–754 Tutorial in German Literature. Fall and spring. 1–4 credits per term. Prerequisite: permission of instructor.

Hours to be arranged. Fall: H. Deinert; spring: Staff. Topic for fall: H. Deinert. Topic for spring: to be announced.

Related Courses in Other Departments

Fall

Marx (Government 376)
Modern Social Theory (Government 699)
Modern Social Theory II (Government 670)
Modern Greek

See listings under Classics.

Modern Hebrew

See listings under Near Eastern Studies.

Hindi-Urdu

101–102 Hindi-Urdu Elementary Course
101, fall; 102, spring. 6 credits each term. Prerequisite for Hindi 102: Hindi 101 or equivalent.
A semi-intensive course for beginners. A thorough grounding in all the language skills is given: listening, speaking, reading, and writing.

201–202 Hindi Reading
201, fall; 202, spring. 3 credits each term. Prerequisites: for Hindi 201, qualification in Hindi; for Hindi 202, Hindi 201 or permission of instructor.
M W F 9:05, G. Kelley.

203–204 Composition and Conversation
203, fall; 204, spring. 3 credits each term. Prerequisites: for Hindi 203, qualification in Hindi; for Hindi 204, Hindi 203 or permission of instructor.
Hours to be arranged. G. Kelley.

301–302 Readings in Hindi Literature
301, fall; 302, spring. 4 credits each term. Prerequisites: for Hindi 301, Hindi 201–202 or equivalent; for Hindi 302, Hindi 301 or equivalent.
Hours to be arranged. G. Kelley.

303–304 Advanced Hindi Composition and Conversation
303, fall; 304, spring. 4 credits each term. Prerequisites: for Hindi 303, Hindi 201–202 or equivalent; for Hindi 304, Hindi 303 or equivalent.
Hours to be arranged. G. Kelley.

305–306 Directed Individual Study
305, fall; 306, spring. 2–4 credits. Prerequisite: Hindi 301–302 and 303–304 or equivalent knowledge of Hindi or Malay.

307–308 Indonesian Language and Composition
307, fall; 308, spring. 4 credits each term. Prerequisites: for Indonesian 307, Indonesian 201–202; for Indonesian 308, Indonesian 307 or equivalent.

311–312 Intensive Course
311, fall; 312, spring. 4 credits each term. Prerequisite: permission of instructor.

Hours to be arranged. J. W. Gair and G. Kelley.

Indonesian

101–102 Elementary Course
101, fall; 102, spring. 6 credits each term. Prerequisite for Indonesian 102: Indonesian 101.

103–104 Intermediate Course
103, fall; 104, spring. 6 credits each term. Prerequisite for Indonesian 104: Indonesian 103.

105–106 Advanced Course
105, fall; 106, spring. 6 credits each term. Prerequisite for Indonesian 106: Indonesian 105.

Hours to be arranged. J. U. Wolff.

301–302 Readings in Indonesian and Malay
301, fall; 302, spring. 4 credits each term. Prerequisites: for Indonesian 301, Indonesian 201–202 or equivalent; for Indonesian 302, Indonesian 301.

303–304 Advanced Indonesian Composition and Conversation
303, fall; 304, spring. 4 credits each term. Prerequisites: for Indonesian 303, Indonesian 201–202; for Indonesian 304, Indonesian 303 or equivalent.

Hours to be arranged. J. U. Wolff.

305–306 Directed Individual Study
305, fall; 306, spring. 2–4 credits. Prerequisite: Indonesian 301–302 and 303–304 or equivalent knowledge of Indonesian or Malay.

307–308 Advanced Composition and Conversation
307, fall; 308, spring. 4 credits each term. Prerequisites: for Hindi 303, Hindi 201–202; for Hindi 304, Hindi 303 or equivalent.

Hours to be arranged. G. Kelley.

311–312 Advanced Hindi Readings
311, fall; 312, spring. 4 credits each term. Prerequisites: for Hindi 311, Hindi 201–202; for Hindi 312, Hindi 310 or equivalent.

Hours to be arranged. G. Kelley.

313–314 Advanced Malay Readings
313, fall; 314, spring. 4 credits each term. Prerequisites: for Indonesian 313, Indonesian 201–202; for Indonesian 314, Indonesian 313 or equivalent.

Hours to be arranged. J. U. Wolff.

FALCON

161–162 Intensive Course
161, fall; 162, spring. 6 credits each term. Prerequisite: permission of instructor.

M–F 6 hours each day. J. U. Wolff and staff.

Related Course

Malayo-Polynesian Linguistics (Linguistics 655–656)

Italian

G. Chierchia, A. Grossvogel, (director of undergraduate studies), 261 Goldwin Smith Hall, 255–4264, C. Rosen

The Major

Students who wish to major in Italian should choose a related course from the lists above. The major is designed to explore developments in Italian literature and culture of the fifteenth through the nineteenth centuries. The student is encouraged to focus on a particular area of interest, and to meet with the instructor for hours to be arranged. The student is also required to take two hours a week for two credits and twice a week for four credits.

401–402 Advanced Readings in Indonesian and Malay Literature
401, fall; 402, spring. 4 credits each term. Prerequisites: for Indonesian 401, Indonesian 301–302 or equivalent; for Indonesian 402, Indonesian 401 or equivalent.

Hours to be arranged. J. U. Wolff.

161–162 Intensive Course
161, fall; 162, spring. 6 credits each term. Prerequisite: permission of instructor.

M–F 6 hours each day. J. U. Wolff and staff.

Related Course

Malayo-Polynesian Linguistics (Linguistics 655–656)

Italian

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The Major

Students who wish to major in Italian should choose a related course from the lists above. The major is designed to explore developments in Italian literature and culture of the fifteenth through the nineteenth centuries. The student is encouraged to focus on a particular area of interest, and to meet with the instructor for hours to be arranged. The student is also required to take two hours a week for two credits and twice a week for four credits.

401–402 Advanced Readings in Indonesian and Malay Literature
401, fall; 402, spring. 4 credits each term. Prerequisites: for Indonesian 401, Indonesian 301–302 or equivalent; for Indonesian 402, Indonesian 401 or equivalent.

Hours to be arranged. J. U. Wolff.
occupies only the junior and senior years, it is wise for students to seek faculty advice about the major as early as possible.

Students who elect to major in Italian ordinarily should have completed Italian 203–204 and the 201–202 sequence in Italian literature by the end of their sophomore year. Exemptions can be made on the basis of an examination. Students majoring in Italian are expected to become conversant with a fair portion of the masterworks of Italian literature, to acquaint themselves with the outlines of Italian literary history, and to develop some skill in literary analysis. To this end, students will be expected to complete successfully 24 credits of Italian literature courses at the 300 level or higher, with papers to be written in Italian or English. One or more courses offered by the Department of Comparative Literature may be counted toward the required 24 credits if students obtain the prior approval of their major adviser. Italian 402, History of the Italian Language, and 403, Linguistic Structure of Italian, may be counted toward the 24 credits required for the major (an introductory linguistics course is a prerequisite of Italian 402 and 403).

Students majoring in Italian will also be expected to acquire competence in the handling of the language. That competence may be demonstrated by passing an examination conducted by American universities that allow the transfer of grades and credit, such as the Syracuse University. Students who elect to major in Italian ordinarily should have completed Italian 203–204 and the 201–202 sequence in Italian literature by the end of their sophomore year. Exemptions can be made on the basis of an examination conducted by American universities that allow the transfer of grades and credit, such as the Syracuse University.

**Fees.** Depending on the course, a small fee may be charged for copies of texts for course work.

### Language and Linguistics

**121–122 Elementary Course** 121, fall; 122, spring. 4 credits each term. Prerequisite for Italian 122: Italian 121 or equivalent. Intended for beginners or students placed by examination. Students who obtain a CPT score of 560 after Italian 121–122 attain qualification and may enter the 200-level sequence; otherwise Italian 123 is required for qualification. Lec: T 10:10, 12:20, or 2:30; drills, M W F 8, 9:05, 10:10, 11:15, 12:20, 1:25, 2:30, or 3:35. I. Chiarchia, M. Swenson, and staff.

A thorough grounding is given in all the language skills: listening, speaking, reading, and writing. Language practice is in small groups. Lectures cover grammar and cultural information.

**123 Continuing Italian** Fall. 4 credits. Limited to students who have previously studied Italian and have a CPT achievement score between 450 and 559. Satisfactory completion of Italian 123 fulfills the qualification portion of the language requirement. M–F 9:05, 10:10 or 11:15. J. Scarpella and staff.

**203–204 Intermediate Composition and Conversation** 203, fall or spring; 204, spring. 3 credits each term. Prerequisites: for Italian 203, qualification in Italian; for Italian 204, 203 or equivalent. 203, fall: M W F 10 to 12:20, or 1:25. I. Chiarchia and staff. Spring: M W F 1:25. J. Scarpella.


Note: Students placed in 200-level courses also have the option of taking courses in introductory literature: see separate listings under Italian 200, 201, and 202 for descriptions of these courses, any of which may be taken concurrently with the Italian 203–204 language courses described above. The introductory literature courses are offered by the respective literature departments, and the Italian 203–204 language courses by the Department of Modern Languages and Linguistics.

### Literature

**201 Introduction to Medieval and Renaissance Literature** Fall. 3 credits. Prerequisite: reading knowledge of Italian. M W F 12:20. Staff. The course will focus on the major figures and texts of medieval and Renaissance literature with an eye on the wider cultural context of Italy. We will begin with readings and discussions of the Sweet New Style (Guinizzelli, Cavalcanti, and Dante) and selections from Petrarch's Canzoniere and Boccaccio's Decameron. Finally, we will look at some poems of Michelangelo, one canto from Ariosto's Orlando Furioso, and Machiavelli's The Prince.

**202 Introduction to Modern Italian Literature** Spring. 3 credits. Prerequisite: reading knowledge of Italian. T R 10:10–11:25. A. Grossvogel and staff. A reading of masterpieces of modern Italian literature with attention to the context in which they arose. Highlights of Galilei and Vico's writing. Selections of novels from romanticism to the contemporary period. The theater of Goldoni and Pirandello. Poetry from Leopardi to Montale.


**327–328 Dante: La Divina Commedia** 4 credits. 327, fall; 328, spring. Not offered 1986–87.

**334 Dante's Divine Comedy (also Comparative Literature 344)** Fall. 4 credits. T R 12:20–1:35. J. Schnapp. Intensive study of Dante's poem in relation to the culture and history of medieval Europe. Major topics: Dante and premodern theories of autobiography, theology and poetics in the Comedy, Dante and the natural sciences, Dante's Christianization of classical epic (Virgil, Lucan, Statius), and the Comedy and Dante's minor works.

### General Courses

**340 Literature and Society in the Italian Renaissance** Spring. 4 credits. Prerequisite: reading knowledge of Italian or permission of instructor. T R 2:30–3:45. M. Migiel. A study of the interaction between literary writing and social problems in Italian Renaissance 1500–1550. Particular attention given to works that seek to define social, cultural, and sexual roles. Readings include Aretino (Sei giornate, selections), Ariosto (Il negromante e Satire), Castiglione (Il libro del cortegiano), Gelli (La circe), Machiavelli (Il principe and La mandragola), and selections from Renaissance lyric poetry (Petrarachs and anti-Petrarchists, the comico-realist poets, women writers).

**344 Dante and Medieval Culture (also Comparative Literature 345)** 4 credits. Not offered 1986–87.

**345 Boccaccio (also Italian 635)** 4 credits. Not offered 1986–87.


**357 The Italian Renaissance Epic** Fall. 4 credits. T R 1–2:15. M. Migiel. A study of Ariosto's Orlando Furioso and Tasso's Gerusalemme Liberata. Reading knowledge of Italian preferred but not essential.


**390 Literature to Cinema (also Comparative Literature 392)** 4 credits. Not offered 1986–87.


**393 Narrative and Ideology in Contemporary Italian Literature (also Italian 593 and Comparative Literature 393)** 4 credits. Not offered 1986–87.


**399 Cinema to Literature** Spring. 4 credits. Taught in English. T R 7:30–9:30 p.m. A. Grossvogel. The course will consist of a comparative study of selected films by Fellini, Antonioni, Visconti, and others and of works by major contemporary writers such as Montale, Ungaretti, Gadda, and Calvino. These authors' similarities and contrasts in invention, style, and techniques will be explored to illustrate the evolution of contemporary aesthetics in cinematography and poetry in Italy.

### Modern Languages, Literatures, and Linguistics

**419–420 Special Topics in Italian Literature** 419, fall; 420, spring. 2–4 credits each term. Prerequisite: permission of instructor. Staff. Guided independent study of specific topics.
Accelerated training in listening, speaking, reading, and writing for students who have already acquired a limited facility in Japanese through residence in Japan or brief formal study but who require additional training to qualify for admission to Japanese 102.

141–142 Introductory Japanese for Business Purposes
Fall, 141; fall, 142; spring. 4 credits each term. Prerequisite: Japanese 141 or placement by the instructor during registration. (For undergraduates only; Graduates, see Japanese 541–542.)

Lecs, T R 1:25; secs. MWF 9:05 or 1:25. Staff. Introductory Japanese for students interested in international business and economics.

201–202 Intermediate Japanese Reading I
Fall, 201; fall, 202; spring, 2 or 3 credits each term. Students having had Japanese 203 and 204 register for 2 credits and attend the W drill and the F lecture; other students register for 3 credits (with permission of instructor) and attend the W drill and the M, W, F lectures. Prerequisites: for Japanese 201, Japanese 203 or placement by the instructor during registration; for Japanese 202, Japanese 201 and 204 or placement by the instructor during registration.

Lecs, MWF 1:25; drill, W 10:10 or 2:30 (with Japanese 205–206). Staff. Reading of elementary texts with emphasis on expository style.

203–204 Intermediate Japanese Conversation
Fall, 203; fall, 204; spring, 4 credits each term. Prerequisites: for Japanese 203, Japanese 202 or placement by the instructor during registration; for Japanese 204, Japanese 203, 205, or 223, or placement by the instructor during registration.

Lecs, MWF 1:25; drills, MTRF 10:10 or 2:30 (with Japanese 205–206). Staff. Training in listening and speaking for students who have acquired a basic oral proficiency.

205–206 Intermediate Japanese Reading I and Conversation
Fall, 205; fall, 206; spring, 6 credits each term. Prerequisites: for Japanese 205, Japanese 202 or placement by the instructor during registration; for Japanese 206, Japanese 205 or placement by the instructor during registration.

Lecs, MWF 1:25; drill, M–F 10:10 or 2:30. Staff. A combination of Japanese 201–202 and 203–204, for students interested in developing both written and oral skills.

223 Transition to Intermediate Japanese Conversation
Fall. 6 credits. Prerequisite: Japanese 160 (Cornell intensive summer course) or placement by the instructor during registration.

Lecs, T R 1:25 plus one hour to be arranged; drills, M–F 12:20. Staff. Provides transition, primarily for summer course students, into regular program. After Japanese 223 the students will have covered the same material that 203 students have covered. Japanese 223 satisfies prerequisites for 204 but not for 206. Recommended also for students with insufficient background to qualify for Japanese 203, determined by examination during registration period.

241–242 Intermediate Japanese for Business Purposes
Fall, 241; fall, 242; spring. 4 credits each term. Prerequisites: for Japanese 241, Japanese 142 or placement by the instructor during registration; for Japanese 242, Japanese 241 or placement by the instructor during registration. (For undergraduates only; Graduates, see Japanese 543–544.)


301–302 Intermediate Japanese Reading II
Fall, 301; fall, 302; spring, 4 credits each term. Prerequisites: for Japanese 301, Japanese 202 or 206 or placement by the instructor during registration; for Japanese 302, Japanese 301 or placement by the instructor during registration.

MWF 2:30; lec to be arranged. Staff. Reading of selected modern texts with emphasis on expository style.

303–304 Communicative Competence
Fall, 303; spring, 3 credits each term. May be repeated for credit. Prerequisite for Japanese 303, Japanese 204 or 206 or placement by the instructor during registration; for Japanese 304, Japanese 303 or placement by the instructor during registration.


341–342 Advanced Japanese for Business Purposes
Fall, 341; spring, 4 credits each term. Prerequisite: permission of instructor.

Hours to be arranged. E. Jorden and staff. This course sequence will offer advanced training in Japanese with concentration on topics relating to the conduct of business. The emphasis will be on spoken skills, with provision for an optional reading component.

401–402 Advanced Japanese Reading
Fall, 401; spring, 4 credits each term. Prerequisites: for Japanese 401, Japanese 402 or placement by the instructor during registration. For Japanese 402, Japanese 401 or placement by the instructor during registration.

MWF 2:30; lec to be arranged. Staff. Reading of selected modern texts with emphasis on expository style.

404 Linguistic Structure of Japanese
Spring. 4 credits. Prerequisites: Japanese 102 or permission of instructor, and Linguistics 101. Not offered 1986–87. Hours to be arranged. Staff.

407–408 Oral Narration and Public Speaking
Fall, 407; spring, 2 credits each term. May be repeated for credit. Prerequisites: for Japanese 407, Japanese 304 or placement by the instructor during registration; for Japanese 408, Japanese 407 or placement by the instructor during registration.

TR 1:25. Staff. Instruction in storytelling, lecturing, and speechmaking, with emphasis on both the construction of discourse and Japanese patterns of oral delivery.

421–422 Directed Readings
Fall, 421; spring, 2 credits each term. Credit to be arranged. Limited to advanced students and offered according to staff-time availability. Prerequisite: placement by the instructor during registration.

Hours to be arranged. Staff. Topics are selected on the basis of student needs.

541–542 Introductory Japanese for Business Purposes
For graduate students only; undergraduates register for Japanese 141–142.

M–F 1:25. Staff. For description see Japanese 141–142.

543–544 Intermediate Japanese for Business Purposes
For graduate students only; undergraduates register for Japanese 241–242. For description see Japanese 241–242.


FALCON

161–162 Intensive Japanese (FALCON) 161, fall; 162, spring. 16 credits each term. Prerequisite: for Japanese 161, Japanese 160 or 162 (Cornell intensive course) or placement by the instructor during registration; for Japanese 162, Japanese 161 or placement by the instructor during registration. M–F 6 hours each day. Staff.

Literature in Japanese

405 Introduction to Modern Literary Japanese
Fall. 4 credits. Prerequisite: Japanese 302 or permission of instructor.
406 Introduction to Classical Japanese Spring. 4 credits. Prerequisite: Japanese 405 or permission of instructor.

An introduction to the grammar and styles of premodern Japanese. Selected readings from literature of various periods.

421–422 Directed Readings 421, fall; 422, spring. Credit to be arranged. Prerequisites: for Japanese 421, Japanese 132 or equivalent; for Japanese 422, Japanese 421 or equivalent.

Hours to be arranged. Staff.

Topic is selected for the basis of student needs.

Note: For complete descriptions of courses numbered 600 or above, consult the appropriate instructor.

611 Seminar in Modern Literature Fall or spring on demand. 2–4 credits. Prerequisite: permission of instructor.

Hours to be arranged. B. deBary.

612 Seminar in Classical Literature Fall or spring on demand. 2–4 credits. Prerequisite: permission of instructor.

Hours to be arranged. K. Brazell.

621–622 Advanced Directed Readings 621, fall; 622, spring. Credit to be arranged. Prerequisite: permission of instructor.

Hours to be arranged. Staff.

Note: See courses listed under Department of Asian Studies for Japanese literature courses in translation.

Javanese

131–132 Elementary Course 131, fall; 132, spring. 3 credits each term. Prerequisites: for Javanese 131, qualification in Indonesian; for Javanese 132, Javanese 131 or equivalent.

Hours to be arranged. J. U. Wolff.

An elementary language course for those who have had no previous experience in the language.

133–134 Continuing Course 133, fall; 134, spring. 3 credits each term. Prerequisites: for Javanese 133, Javanese 132 or equivalent; for Javanese 134, Javanese 133 or equivalent.

Hours to be arranged. J. U. Wolff.

203–204 Directed Individual Study 203, fall; 204, spring. 3 credits. Prerequisite: Javanese 134 or equivalent.

Hours to be arranged. J. U. Wolff.

This is a practical language course on an intermediate level in which the students will work through readings and conversations under the guidance of a native speaker for three contact hours a week.

Old Javanese

See Linguistics 651–652.

Linguistics

Linguistics, the systematic study of human speech, lies at the crossroads of the humanities and the social sciences, and much of its appeal derives from the special combination of intuition and rigor that the analysis of language demands. The interests of the members of the Department of Modern Languages and Linguistics span most of the major subfields of linguistics—phonetics and phonology, the study of speech sounds; syntax, the study of sentence structure; semantics, the study of meaning; historical linguistics, the study of language change in time; sociolinguistics, the study of language as a social and cultural artifact; and applied linguistics, which relates the results of linguistic research to problems of bilingual education, second-language learning, and similar practical concerns. In theory, the gulf between the study of language in general and the study of particular languages, such as Spanish or German, is very wide; in practice, however, the two are intimately connected, and a high proportion of the students who enroll in linguistics courses at Cornell owe their initial interest in the discipline to a period of exposure to a foreign language in college or high school.

Students interested in learning more about linguistics and its relationship to other disciplines in the humanities and social sciences are encouraged to take Linguistics 101–102, which is a prerequisite for further work in the field. The Cornell Linguistic Circle, a student organization, sponsors weekly colloquia on linguistic topics; these meetings are open to the University public, and anyone wishing to learn more about linguistics is most welcome to attend.

The Major

The major in linguistics has two prerequisites: (1) completion of Linguistics 101–102, and (2) proficiency in one language other than English or qualification in two languages other than English, one of which must be non-Indo-European or non-European. Some students may be unable to attain qualification in a non-European language before entering the major, in which case the requirement may be completed after admission to the major.

Completion of the major requires:

1) three of the following:
   a) Linguistics 301
   b) Linguistics 303
   c) Linguistics 310
   d) a course in historical method, such as Linguistics 404 or 410, or the history of a specific language or family
2) a course at or beyond the 300 level in the structure of English or some other language or a typological or comparative structure course such as Linguistics 401
3) a minimum of 16 additional credits chosen in consultation with the adviser from:
   a) other linguistics courses
   b) courses with significant linguistic content from another discipline, for example, philosophy, anthropology, psychology
   c) courses in a non-European or non-Indo-European language (not literature), provided that the same courses have not been used for other requirements

Prospective majors should see Professor Gair, 407 Morrill Hall.

For other courses relevant to linguistics, see anthropology, psychology, human development and family studies, computer science, and philosophy.

Honors

Applications for honors should be made during the junior year. Candidates for admission must have a 3.0 (B) average overall and should have a 3.2 average in linguistics courses. In addition to the regular requirements of the major, the candidate for honors will complete an honors thesis and take a final oral examination in defense of it. The thesis is usually written during the senior year but may be begun in the second term of the junior year when the student's program so warrants. The oral examination will be conducted by the honors committee, consisting of the thesis adviser and at least one other faculty member in linguistics.

Members of other departments may serve as additional members if the topic makes this advisable. Linguistics 493 and 494 may be taken in conjunction with thesis research and writing but are not required.

Distribution Requirement

The distribution requirement in the social sciences may be satisfied by taking Linguistics 101 and (1) any other course in linguistics or (2) any other course offered by the Department of Modern Languages and Linguistics for which this introductory linguistics course is a prerequisite.

101–102 Theory and Practice of Linguistics 101, fall or summer; 102, spring. 4 credits each term.

MWF 9:05; disc to be arranged. J. Gair and staff.

An introductory course designed to provide an overview of the science of language. Linguistics 101 plus any other course in linguistics plus any DMLL course for which Linguistics 101 is a prerequisite satisfies the social science distribution requirement.

[111 Themes in Linguistics Fall. 4 credits. Intended primarily for nonmajors. (Prospective linguistics majors should see Linguistics 101–102.) Not offered 1986–87

MWF 10:10. Staff

Basic linguistic concepts are introduced and the relationship of linguistics to other disciplines is explored, with emphasis on biological, psychological, social, and cultural contexts of language use.]

[113]–114 Hispanic Bilingualism [113, fall;] 114, spring. 3 credits each term. Linguistics 113 is not a prerequisite for 114. Freshman Seminar. 113 not offered 1986–87.

TR 2:30–4:45. I. Almirall-Padams.

An introductory sociolinguistics course on the speak of the Hispanic bilingual in the United States. Fall semester topics include the relationship between standard languages and dialects, ethnic, Spanish, English code-switching vs. interference, and variation related to social function. Spring semester topics concentrate on variation in the use of Spanish and English in the different Hispanic communities established in the United States.


MWF 9:05. J. E. Grimes

Language diversity has a place in our complex world. Whether spoken by a handful of speakers or by hundreds of millions, each language manages the same tasks of communication and fits in with its social environment. Language identification, literacy, and multilingualism are among the issues touched on. Applicable toward the social science distribution requirement.]

200 Traditional English Grammar for Foreign Language Students Fall. 1 credit. Open only to students concurrently enrolled in a foreign language course. S-U grades only.

W 11: 5. H. L. Kufner

Rapid review of grammatical terminology and those features and processes of English that are of particular relevance and usefulness in the learning of English, German, Italian, Russian, or Spanish. Weekly homework assignments; no prelims; no final examinations.

201 Phonetics I Fall. 3 credits.

TR 8:30–9:45; disc to be arranged. J. Kingston.

An introduction to phonetic theory, with an equal emphasis on the general properties of speech production, acoustics, and perception. Training in production and transcription in a discussion section.

202 Phonetics II Spring. 3 credits. Prerequisite: Linguistics 201.

TR 8:30–9:45; disc to be arranged. J. Kingston.

Phonetic explanation in phonology, focusing both on origin and development of recurrent sound patterns in languages and on the testing of the psychological reality of theoretical constructs in phonology.

[205 Understanding the Language of Television Images Fall. 4 credits. Not offered 1986–87.

TR 9:05, M 2:30. L. Waugh

TV images convey connotative and denotive meanings that are widely understood. How do we read these images? What is the underlying, grammar-like structure that arranges them as signs and symbols in a shared meaning system? Using the techniques and concepts of content analysis (from sociology) and semiotics (from linguistics), we will decode images in product commercials.]}

Since literature is merely a highly specialized sector of language in general, the science of language has much to contribute even to humanists whose primary interest is in literary texts. This course will survey many of the basic linguistic divisions: phonology, morphology, syntax, and language change and will explore in some depth the implications of all the selected topics for literary studies.

[244 Language and the Sexes (also Women's Studies 244)] Spring. 4 credits. For nonmajors or majors. Not offered 1986–87. Hours to be arranged. Staff.

264 Language, Mind, and Brain Spring. 4 credits. For nonmajors or majors. Prerequisite: a basic course in linguistics and/or psychology is desirable. 


A survey of what is currently known about the structure and function of natural language, with emphasis on the following topics: the basic biology of language, mental representation of linguistic knowledge, mechanisms of linguistic performance, universal grammar and the modularity hypothesis, and language and cognition.

300 Multilingual Societies and Cultural Policy Spring. 4 credits. 


An interdisciplinary analysis of the impact of bilingualism on society, particularly in education and communication arts. The FLEX model is used to suggest a method of evaluating policy and program alternatives.

301–302 Phonology I, II Spring. 4 credits each term. Prerequisite for 302: Linguistics 301 or permission of instructor.


This is an introduction to phonetics and to contemporary phonological theory, with emphasis on the analysis of American English. 302 deals with advanced issues in generative phonology, including the nature of phonological rule systems, the structure of phonological representations, and the analysis of prosodic features (tone, stress, accent).

303–304 Syntax I, II Fall. 4 credits each term. Prerequisite for 304: Linguistics 303 or permission of instructor.


303 is an introduction to syntactic theory, with emphasis on the classical theory of transformational grammar. 304 is an advanced course, surveying current syntactic models and dealing with such issues as the nature of syntactic representation, levels of representation, principles of universal grammar, and the relation of syntax and semantics.


A general survey of syntactic theories that highlight grammatical function and reveal its role in discourse structure.]

309–310 Morphology I, II Fall. 4 credits each term. Prerequisites: for Linguistics 309, Linguistics 101 or equivalent; for Linguistics 310, Linguistics 302 or permission of instructor.


309 is a general survey focusing on the relationship of meaning and form in morphology and introducing techniques of morphological analysis. 310 considers recent discussions in morphological theory.

311–312 The Structure of English Spring. 4 credits each term. Prerequisite: for Linguistics 311, Linguistics 102 or permission of instructor; for Linguistics 312, Linguistics 311 or permission of instructor. Offered alternate years.

Hours to be arranged. Staff.

311 provides an overview of the syntactic structure of English, drawing upon relevant theoretical approaches. 312 deals with phonology, morphology, and special problems of English structure and semantics.

[313 English for Teachers of English Fall. 4 credits. Prerequisite: for undergraduate majors, Linguistics 101–102 or equivalent; for graduate students, concurrent registration in Linguistics 101 or equivalent. Not offered 1986–87. M.W.F 11:15, plus one hour to be arranged. M. Martin. A course in modern English for teachers of nonnative speakers. An analysis of the phonetics, grammar, and semantics of the language in terms applicable to both classroom teaching and materials development.]

[314 Teaching English as a Foreign Language Spring. 4 credits. Prerequisite: Linguistics 313 or permission of instructor. Not offered 1986–87. M.W.F 11:15, plus one hour to be arranged. M. Martin. Methods and techniques used in the teaching of English language skills to native speakers are examined. Attention is given to materials design and to current issues and new trends in the field.]

[318 Style and Language Fall. 4 credits. Prerequisite: Linguistics 101 or permission of instructor. Not offered 1986–87. TR 1–2:15. G. M. Messing.]


323 Comparative Romance Linguistics Fall. 4 credits. Prerequisite: Linguistics 101 or equivalent, and qualification in any Romance language. M.W.F 2:30. C. Rosen.

The Romance language family in a typological perspective. Salient features of eight Romance languages: broad and localized trends in phonology, syntax, and the lexicon; and elements of diachotomy.


An introduction to the study of such topics as speech acts, presupposition, deixis, implicatures, and conversational strategies.]

341 India as a Linguistic Area Fall, according to demand. 4 credits. Prerequisite: Linguistics 102 or permission of instructor.

Hours to be arranged. J. W. Gair, G. Kelley.

A basic introduction to the linguistic and sociolinguistic character of the subcontinent, with special attention to cross-linguistic family influences and convergence.

400 Semiotics and Language (also Comparative Literature 410) Spring. 4 credits. Prerequisites: some background in linguistics, philosophy, psychology, anthropology, or literary theory, or permission of instructor.

M.W. 2:30–3:45. L. R. Waugh.

An introduction to the study of semiotics in general and to particular semiotic theories (for example, those of Saussure, Perce, Jakobson) and to language as a semiotic system.

401 Language Typology Fall. 4 credits. Prerequisite: Linguistics 101–102 or equivalent. M.W.F 10:10. C. Rosen.

Study of a basic question of contemporary linguistics: in what ways do languages differ, and in what ways are they all alike? Efforts to characterize the total repertory of constructions available to natural languages.

Common morphological devices and their syntactic correlates. Emphasis on two approaches to universals: (1) relational grammar and (2) the work of Joseph Greenberg.

402 Languages in Contact Fall. 4 credits. Prerequisite: Linguistics 101–102 or permission of instructor. Offered alternate years.

M.W. F 9:05. H. L. Kufner.

Examination of a variety of areas where languages exhibit interference phenomena: diglossia, bilingualism, dialects, second-language acquisition.

403 Introduction to Applied Linguistics Fall. 4 credits. Prerequisite: completion of a course in the structure of a language at the 400 level.


Examination of the theoretical bases of applied linguistics, including second-language learning and current language-teaching methodologies.

405–406 Sociolinguistics 405, fall; 406, spring. 4 credits each term. Prerequisite: Linguistics 101–102 or permission of instructor. Linguistics 405 is not a prerequisite to 406.


405: Social differences in the use of language according to sex, class, age, race, situation, etc. Societal multilingualism, diglossia, etc. Social attention to language: norms and standards, taboo and euphemism, and language planning. 406: The study of language variation. The treatment of sociolinguistic issues in the study of sociolinguistic differences. Variable rules, locating variation in the grammar, and quantitative methods in linguistics.

410 Introduction to Historical Linguistics Spring. 4 credits. Prerequisite: Linguistics 102 or permission of instructor.

Hours to be arranged. J. Jasanoft.

A survey of the basic mechanisms of linguistic changes, with examples from a variety of languages.

[415–416 Social Functions of Language 415, fall; 416, spring. 4 credits each term. Prerequisites: Linguistics 101 or permission of instructor. Not offered 1986–87.

Hours to be arranged. G. Kelley.

The function of language in society; social constraints on linguistic behavior, including taboos, jargons, registers, social and socially perceived dialects.]

417 History of the English Language Fall. 4 credits. Prerequisite: permission of instructor.


Development of modern English; external history; phonological, grammatical, and lexical change. The English language in America.

421–422 Semantics I, II 421, fall; 422, spring. 4 credits each term. Prerequisites: for Linguistics 421, Linguistics 102; for Linguistics 422, Linguistics 421 or permission of instructor.


421 is an introduction to central issues and techniques in recent work on the semantic structure of natural languages. 422 is an advanced course focused on selected topics and debates in recent semantic theory.

425–426 Structure of Bantu I and II 425, fall; 426, spring. 4 credits each term. Prerequisites: for Linguistics 425, Linguistics 301 or permission of instructor; for Linguistics 426, Linguistics 303 and 425 or permission of instructor.

Hours to be arranged. G. N. Clements.

425 is an introduction to descriptive and historical Bantu linguistics. Following a review of basic features of Proto-Bantu grammar and lexicon, we examine the phonology and morphology of a selected Bantu language with the help of a native speaker assistant. 426 is a sequel to Linguistics 425 and investigates aspects of Bantu syntax and its relation to phonology, morphology, and discourse function.
436 Language Development (also Psychology and Human Development and Family Studies) Spring. 4 credits. Prerequisite: at least one course in cognitive psychology, cognitive development, or linguistics. Offered alternate years. T R 10:10–12:05. B. Lust. A survey of basic literature in language development. Major theoretical positions in the field are considered in the light of studies in first-language acquisition of phonology, syntax, and semantics from infancy onward. The fundamental issue of relations between language and cognition will be discussed. The acquisition of communication systems in nonhuman species such as chimps and problems of language pathology will also be addressed, but the main emphasis will be on normal language development in the child.

440 Dravidian Structures Fall or spring, according to demand. 4 credits. Prerequisite: Linguistics 102. Hours to be arranged. G. Kelley. A comparative and contrastive analysis of the structures of several Dravidian languages.

442 Indo-Aryan Structures Fall or spring, according to demand. 4 credits. Prerequisite: Linguistics 102. Hours to be arranged. J. W. Gair. Typological discussion of the languages of the subfamily, phonology and grammar.

493 Honors Thesis Research Fall. 4 credits. May be taken before or after Linguistics 494, or may be taken independently.

494 Honors Thesis Research Spring. 4 credits. Hours to be arranged. Staff. May be taken as a continuation of, or before, Linguistics 493.

500 Field Methods Fall or spring. 4 credits. Prerequisites: Linguistics 101 or 201. Hours to be arranged. D. Solnit. Elicitation, recording, and analysis of data from a native speaker of a non-Western language not generally known to students.

502 Proseminar: Introduction to Graduate Study Spring. 4 credits. Primarily for first-year graduate students majoring in general linguistics but, with permission of instructor, open to those minoring in linguistics or majoring in the linguistics of specific languages. Hours to be arranged. J. Gair, W. Harbert. A survey of the major subareas of linguistics. Emphasis is on basic concepts, current issues and their background, and methodology, with discussions and data-oriented problems based on extensive readings.

503 History of Linguistics Fall. 4 credits. M W F 1:25. G. M. Messing. The history of linguistics from early Greek and Sanskrit grammarians to the modern period.

504 Research Workshop Spring. 4 credits. Prerequisite: three or more semesters of graduate study in linguistics. Hours to be arranged. Staff. Participants will present their own ongoing research and discuss it with their colleagues. Individual topics will be chosen on the basis of interest, experience, and probable focus of dissertation research.

507 Schools of Linguistics Fall. 4 credits. Prerequisites: Linguistics 102 or 602 and permission of instructor. Not offered 1986–87. Hours to be arranged. J. E. Grimes. Readings and descriptions of major contemporary schools of linguistic thought in the twentieth century.

508 Discourse Analysis Fall. 4 credits. Prerequisite: permission of instructor. Not offered 1986–87. T 2:30–4:30. J. E. Grimes. Linguistic theory applied to relationships beyond the sentence.

517–518 Hittite 617, fall; 618, spring. 4 credits each term. Prerequisites: for Linguistics 617 permission of instructor; for Linguistics 618, Linguistics 617 or permission of instructor. Not offered 1986–87. Hours to be arranged. J. Jasanoff.

519 Rigveda Fall. 4 credits. Hours to be arranged. J. Jasanoff. Reading and linguistic analysis of selected Vedic hymns.

620 Area Topics in Romance Linguistics Spring. 4 credits. May be repeated for credit. Offered alternate years.

621 Problems and Methods in Romance Linguistics Spring. 4 credits. Prerequisite: one syntax course and qualification in two Romance languages. Hours to be arranged. C. Rosen. Central topics in Romance syntax in the light of current theories of universal grammar.


623–624 Old Irish 623, fall; 624, spring. 4 credits each term. Prerequisite for 624: 623 or permission of instructor. Not offered 1986–87. Hours to be arranged. J. Jasanoff.

625–626 Middle Welsh 625, fall; 626, spring. 4 credits each term. Prerequisites: knowledge of one recent or medieval European language or permission of instructor; for Linguistics 626, Linguistics 625 or equivalent. Not offered 1986–87. Hours to be arranged. Staff. The course is intended for linguists, medievalists, folklorists, and others who want to read the Mabinogion and other medieval Welsh tales in the original. We will begin with an overview of Welsh grammar and then read the first two books of the Mabinogion, Pwyll and Branwen. In the continuation we will read more of the Mabinogion and selections from Middle Welsh verse.

627 Advanced Old Irish Spring. 3 credits. Prerequisite: one year of Old Irish. Not offered 1986–87. Hours to be arranged. Staff. A seminar in the early Irish saga Tain Bo Cuailnge (The Cattle Raid of Cooley). We will read the text in Irish and discuss in depth problems of grammar and interpretation.


633 Seminar in First-Language Acquisition: Cross-linguistic Studies of the Acquisition of Anaphora Fall or spring. 1–4 credits. Prerequisite: Linguistics 436 or equivalent or permission of instructor. Not offered 1986–87. Hours to be arranged. Staff. This seminar will review and critique current theoretical and experimental studies of the first-language acquisition of anaphora, with a concentration on insights gained by cross-linguistic study of this area. The seminar will focus on relating current developments in linguistic theory regarding anaphora to current experimental research on first-language acquisition of anaphora. Attention will also be given to the development of research proposals.

635–636 Indo-European Workshop 635, fall; 636, spring. 4 credits each term. Prerequisite: permission of instructor. Hours to be arranged. Fall: A. Nussbaum; spring: J. Jasanoff. An assimilation of subjects intended for students with previous training in Indo-European linguistics; problems in the reconstruction of Proto Indo-European, topics in the historical grammars of the various IE languages, reading and historical linguistic analysis of texts, and grammatical sketches of "minor" IE languages.

640 Elementary Sanskrit Fall or spring, according to demand. 3 credits. Not offered 1986–87. Hours to be arranged. J. W. Gair. An introduction to the language of the canonical texts of Theravada Buddhism. Reading of authentic texts, with emphasis on both content and grammatical structure.


651–652 Old Javanese Fall or spring, according to demand. 4 credits. Hours to be arranged. J. U. Wolff. Grammar and reading of basic texts.

653–654 Seminar in Southeast Asian Linguistics 653, fall; 654, spring. 4 credits each term. Prerequisite: Linguistics 303 or permission of instructor. Linguistics 653 is not a prerequisite for 654. Hours to be arranged. Staff. Languages of mainland Southeast Asia. Topics, chosen according to student interests, may include description, dialectology, typology, comparative reconstruction, and historical studies.

655–656 Seminar in Austronesian Linguistics 655, fall; 656, spring. 4 credits each term. Prerequisites: for Linguistics 655, Linguistics 102 and permission of instructor; for Linguistics 656, Linguistics 655. Hours to be arranged. J. U. Wolff. Descriptive and comparative studies of Malayo-Polynesian languages.

657–658 Seminar in Austrasian Linguistics 657, fall; 658, spring. 4 credits each term. Prerequisites: Linguistics 102 and permission of instructor. Not offered 1986–87. Hours to be arranged. F. E. Huffman. Descriptive and comparative studies of Austrasian languages.

700 Seminar Fall or spring, according to demand. Credit to be arranged. Hours to be arranged. Staff. Seminars are offered according to faculty interest and student demand. Topics in recent years have included subject and topic, Montague grammar, speech synthesis, lexicography, classical and autonomous phonology, Japanese sociolinguistics, relational grammar, semantics and semiotics, and others.

701–702 Directed Research 701, fall; 702, spring. 1–4 credits. Hours to be arranged. Staff.

753 Tibeto-Burman Linguistics Fall. 4 credits. Prerequisites: Linguistics 404 or equivalent, and permission of instructor. Hours to be arranged. Staff. Comparative reconstruction of Tibeto-Burman, with emphasis on the Lolo-Burmese branch and historical study of Burmese. See also courses on the structure and history of particular languages or language families listed, e.g., under Chinese, French, German, Italian, Japanese, Russian, or Spanish.
Nepali

101–102 Elementary Nepali 101, fall; 102, spring. 6 credits each term. Prerequisite: for Nepali 102, Nepali 101 or examination.

Hours to be arranged. K. S. March and staff.

Intended for beginners or students placed by examination. The emphasis is on basic grammar and speaking and comprehension skills, utilizing culturally appropriate materials and texts. Devanagari script for reading and writing is also introduced.

201–202 Intermediate Nepali Conversation 201, fall; 202, spring. 3 credits each term. Prerequisites: for Nepali 201, Nepali 102 or examination; for Nepali 202, Nepali 201 or examination.

Hours to be arranged. K. S. March and staff.

Intermediate instruction in grammar and speaking and verbal comprehension skills, with special attention to developing technical vocabularies and other verbal skills appropriate to students’ professional fields.

203–204 Intermediate Nepali Composition 203, fall; 204, spring. 3 credits each term. Prerequisites: for Nepali 203, Nepali 102 or examination; for Nepali 204, Nepali 203 or examination.

Hours to be arranged. K. S. March and staff.

A systematic review of written grammar and reading comprehension, with special attention to the technical vocabularies, necessary writing skills, and published materials typical of advanced students’ professional fields.

Pali

See Linguistics 640.

Polish

131–132 Elementary Course 131, fall; 132, spring. 3 credits each term. Prerequisite for Polish 132: Polish 131 or equivalent.

M W F 10:10 or 1:25. E. W. Browne.

[133–134 Continuing Course '133, fall; 134, spring. 3 credits each term. Prerequisites: for Polish 133, Polish 132 or equivalent; for Polish 134, Polish 133 or equivalent. Not offered 1986–87.

Hours to be arranged. E. W. Browne.]

Portuguese

Language and Linguistics

121–122 Elementary Course 121, fall; 122, spring. 4 credits each term. Intended for beginners or for those who have been placed in the course by examination. Students may attain qualification upon completion of 122 by achieving a satisfactory score on a special examination.


A thorough grounding is given in all the language skills: listening, speaking, reading, and writing.

203–204 Intermediate Composition and Conversation 203, fall; 204, spring. 3 credits each term. Prerequisites: for Portuguese 203, qualification in Portuguese; for Portuguese 204, Portuguese 203 or permission of instructor.


Conversational grammar review with special attention to pronunciation and the development of accurate and idiomatic oral expression. Includes readings in contemporary Portuguese and Brazilian prose and writing practice.

303–304 Advanced Composition and Conversation 303, fall; 304, spring. 4 credits each term. Prerequisite: for Portuguese 303, Portuguese 204 or equivalent; for Portuguese 304, Portuguese 303 or equivalent.

Hours to be arranged. J. Oliveira.

305–306 Readings in Luso-Brazilian Culture 305, fall; 306, spring. 4 credits each term. Prerequisites: Portuguese 204 or equivalent or permission of instructor.

Hours to be arranged. Staff.

700 Seminar in Portuguese Linguistics Fall or spring, according to demand. 4 credits.

Hours to be arranged. Staff.

Selected problems in the structure of Portuguese.

Literature

[390 Culture and Civilization of the Lusophone World: Brasil 4 credits. Prerequisites: knowledge of Portuguese and permission of instructor. Not offered 1986–87]

[395 Contemporary Brazilian Short Story 4 credits. Prerequisites: knowledge of Portuguese and permission of instructor. Not offered 1986–87]

[396 Contemporary Portuguese Short Story 4 credits. Prerequisites: knowledge of Portuguese and permission of instructor. Not offered 1986–87]

[399 Culture and Civilization of the Lusophone World: Portugal. 4 credits. Prerequisite: knowledge of Portuguese and permission of instructor. Not offered 1986–87]

Quechua

[131–132 Elementary Course 131, fall; 132, spring. 3 credits each term. Prerequisite: qualification in Spanish. Not offered 1986–87.


A beginning conversation course in the Cuzco dialect of Quechua.]

[133–134 Continuing Course 133, fall; 134, spring. 3 credits each term. Prerequisites: for Quechua 133, Quechua 131–132 or equivalent; for Quechua 134: Quechua 133 or equivalent. Not offered 1986–87.

Hours to be arranged. D. F. Solá.

An intermediate conversation and reading course. Study of the Huarochoi manuscript.]

[135–136 Quechua Writing Lab 135, fall; 136, spring. 1 credit each term. Prerequisites: concurrent enrollment in Quechua 131–132 or instructor’s approval. Letter grade only. Not offered 1986–87.

Hours to be arranged. D. F. Solá.

Computer-assisted drill and writing instruction in elementary Quechua.]

[403 Linguistic Structure of Quechua Fall. 4 credits. Not offered 1986–87.

Hours to be arranged. D. F. Solá.

Survey of the grammatical structure of Quechua dialects.]

700 Seminar in Quechua Linguistics Fall or spring. Credit to be arranged. Prerequisite: permission of instructor.

Hours to be arranged. D. F. Solá.

Romance Linguistics and Literature

Linguistics

[321 History of the Romance Languages Fall. 4 credits. Prerequisite: Linguistics 101 or equivalent, and qualification in any Romance language. Not offered 1986–87.


For description see Linguistics 321.]

[323 Comparative Romance Linguistics Fall. 4 credits. Prerequisite: Linguistics 101 or equivalent, and qualification in any Romance language. M W F 2:30. C. Rosen.

For description see Linguistics 323.]

620 Area Topics in Romance Linguistics Spring. 4 credits. May be repeated for credit. Offered alternate years.

621 Problems and Methods in Romance Linguistics Spring. 4 credits. Prerequisite: one syntax course and qualification in two Romance languages.

Hours to be arranged. C. Rosen.

For description see Linguistics 621.


Hours to be arranged. C. Rosen.

For description see Linguistics 622.]

See also Classics 423, Vulgar Latin.

Literature

109 Freshman Seminar: Techniques of Interpretation: An Introduction to Semiotics (also French 109) Fall or spring. 3 credits.

M W F 9:05 or 1:25. Staff.

In its broadest meaning, semiotics is the study of signs that carry information: roadside signs, fashions, advertisements, publicity posters, literary modes. This course, which does not presuppose prior technical knowledge, will introduce the students to a critical reading of signs: the signifier (the concrete expression of the sign) and the signified (the message) and their various interactions. Readings will include such books as R. Barthes, Mythologies, or T. Hawkes, Structuralism and Semiotics. Exercises will be essays on how to analyze various signs taken from practical experience, such as advertisements from magazines or TV, or from cultural phenomena (fashion codes, artistic modes).

[404 Cogito Ergo Sum: Thought and Existence from Descartes to Sartre (also Comparative Literature 404 and Romance Studies 404) 4 credits. Not offered 1986–87]

431 Iams: General Concepts in Modern Cultural History (also Comparative Literature 431) Spring. 4 credits. Taught in English.

M–F 9:00–11:25. C. Arroyo.

An attempt to define these terms: humanism, baroque, classicism, romanticism, realism, Marxism, symbolism, surrealism, existentialism, structuralism, and poststructuralism. The meaning of general terms in literary criticism. Literary criticism and literary history. Literature and history in general.

[459 Being, God, Mind: Key Terms of Western Thought from Plato to Vico (also Comparative Literature 459) Not offered 1986–87]


497 Heidegger: Short Writings (also Comparative Literature 497 and German 497) 3 credits. Not offered 1986–87.

Romanian

131–132 Elementary Course 131, fall; 132, spring. Offered according to demand. 3 credits. Prerequisite for Romanian 132: Romanian 131 or equivalent.

133–134 Continuing Course 133, fall; 134, spring. Offered according to demand. 3 credits. Prerequisite for Romanian 134: Romanian 133 or equivalent.
Russian
L. H. Babby, E. W. Browne, P. Carden, C. Emerson, G. Gibian (director of undergraduate studies [literature] 93 Goldwin Smith Hall, 255-8350), R. L. Leed (director of undergraduate studies [language], 302 Morrill Hall, 255-3222), S. Senderovich

The Russian Major
Russian majors study Russian language, literature, and linguistics, emphasizing their specific interests. It is desirable, although not necessary, for prospective majors to complete Russian 101–102, 201–202, and 203–204 as freshmen and sophomores, since these courses are prerequisites to most of the junior and senior courses that count toward the major. Students may be admitted to the major upon satisfactory completion of Russian 102 or the equivalent. Students who elect to major in Russian should consult both Professor Gibian and Professor Leed as soon as possible. For a major in Russian, students will be required to complete (1) Russian 301–302 or 303–304 or the equivalent, and (2) 18 credits from 300- and 400-level literature and linguistics courses, of which 12 credits must be in literature in the original Russian.

Certain courses may have the permission of the instructor, be taken for one additional hour's credit. Such courses will involve a one-hour section each week with work in the Russian language. These courses count one hour each of credit towards the 12 courses of Russian literature in the original language required for the major.

Study Abroad
Cornell is an affiliated institution in the program for Russian language study at Leningrad State University. Opportunities are available for study during the summer, a single semester, or the full year. Further information is available from Professor Wayles Browne.

Honors. Students taking honors in Russian undertake individual reading and research and write an honors essay.

Fees. Depending on the course, a small fee may be charged for photocopied texts for course work.

Freshman Seminar requirement. The following courses will satisfy the Freshman Seminar requirement: Russian 103, 104, 105, and 107.

Russian and Soviet Studies Major
See "Special Programs and Interdisciplinary Studies." which follows the department listings.

Language and Linguistics

101–102 Elementary Courses 101, fall; 102, spring. 6 credits each term. Prerequisite for Russian 102: Russian 101 or equivalent. Intended for beginners or students placed by examination and those who wish to obtain qualification within two semesters or who wish to enter the 200-level course the following fall semester. Lecs, T R 11:15 or 2:30; drills, M F 9:05, 12:20, or 1:25. R. L. Leed and staff.

A thorough grounding is given in all the language skills: listening, speaking, reading, and writing. Language practice is in small groups. Lectures cover grammar, reading, and cultural information.

121–122 Elementary Course 121, fall; 122, spring. 4 credits each term. Prerequisite for Russian 122: Russian 121 or equivalent. Intended for beginners or students placed by examination. The sequence 121–122–123 covers the same material as 101–102–103 at a less intensive pace. Students who obtain a CPT achievement score of 560 after Russian 121–122 attain qualification and may enter the 200-level sequence; otherwise Russian 123 is required for qualification. Lecs, F 1:25 or 2:30; drills, M T W R 9:05, 12:20, or 1:25. R. L. Leed and staff.

123 Continuing Russian Fall or summer 4 credits. Limited to students who have previously studied Russian and have a CPT achievement score between 450 and 559. Satisfactory completion of Russian 123 fulfills the qualification portion of the language requirements.

Lecs: F 3:35; drills, M T W R 12:20 or 3:35. A. Kraft. A prerequisite course designed to prepare students for study at the 200 level. Passing this course is equivalent to qualification.

203–204 Intermediate Composition and Conversation 203, fall, spring, or summer; 204, spring. 3 credits each term. Prerequisite: qualification in Russian. Prerequisite for Russian 204: Russian 203 or equivalent.

203, fall. M T R F 11:15 or 2:30; spring. M T R F 10:10; L. and S. Paperno.

204, spring. M T R F 11:15 or 2:30; L. and S. Paperno. Guided conversation, composition, reading, pronunciation, and grammar review. Emphasizing the development of accurate and idiomatic expression in the language.

205–206 Russian for Scientists 205, fall or summer; 206, spring. 2 credits each term. Prerequisites: for Russian 205, qualification in Russian; for Russian 206, Russian 205. This course cannot be used to satisfy the proficiency level for the language requirement, nor can it be used to satisfy the humanities requirement.

Hours to be arranged. S. Paperno.

Reading unabridged articles on a variety of topics in mathematics, physics, chemistry, biology, and engineering.

Note: Students placed in the 200-level courses also have the option of taking courses in introductory literature; see separate listings under Russian 201 and 202 for descriptions of these courses, any of which may be taken concurrently with the 203–204 language courses described above. The introductory literature courses are offered by the Department of Russian Literature, and the 203–204 language courses by the Department of Modern Languages and Linguistics.

303–304 Advanced Composition and Conversation 303, fall; 304, spring. 4 credits each term. Prerequisite: Russian 303, Russian 204 or equivalent; for Russian 304, Russian 303 or equivalent. M W F 10:10 L. and S. Paperno.

305–306 Directed Individual Study 305, fall; 306, spring. 2 credits. Prerequisites: for Russian 305; Russian 303–304 or equivalent; for Russian 306, Russian 305. Hours to be arranged. Staff.

401–402 History of the Russian Language 401, fall; 402, spring. 4 credits each term. Prerequisites: for Russian 401, qualification in Russian; for Russian 402, Russian 401 or equivalent. Offered alternate years. Not offered 1986–87. Hours to be arranged. S. Paperno.

403–404 Linguistic Structure of Russian 403, fall; 404, spring. 4 credits each term. Prerequisite for Russian 403: qualification in Russian; Linguistics 101–102 recommended. Prerequisite for Russian 404: Russian 403 or equivalent. Offered alternate years.


Phonological, morphological, and syntactic developments from Old Russian to modern Russian.

405–406 Advanced Russian Morphology and Syntax 405, fall; 406, spring. 4 credits each term. Prerequisites: for Russian 405, Russian 304 or permission of instructor; for Russian 406, Russian 405. Offered alternate years. T R 2:30–4 L. H. Babby.

This course is intended primarily to increase the student's command of difficult Russian syntactic constructions. Special attention is paid to word order, impersonal sentences, negation, participles, gerunds, and also to building active vocabulary through reading modern Russian prose.

407 Russian for Teachers Fall. 4 credits. Prerequisite: Russian 204 or equivalent.

Hours to be arranged. R. L. Leed.

Application of linguistics to language teaching: teaching methods; contrastive analysis of English and Russian; and practice teaching.

413–414 Advanced Conversation and Stylistics 413, fall; 414, spring. 2 credits each term. Prerequisites: for Russian 413, Russian 303–304 or the equivalent, for Russian 414, Russian 413. Hours to be arranged. L. and S. Paperno.

Reading and discussion of authentic unabridged Russian texts in a variety of nonliterary styles and genres.

[601 Old Church Slavic Fall. 4 credits. This course is prerequisite to Russian 602. Offered alternate years. Not offered 1986–87. Hours to be arranged. E. W. Browne. Grammar and reading of basic texts.]

602 Old Russian Fall. 4 credits. Prerequisite: Russian 601. Offered alternate years. Hours to be arranged. L. H. Babby.

Grammatical analysis and close reading of Old Russian texts.

633–634 Russian for Graduate Specialists 633, fall; 634, spring. 2 credits each term. Prerequisite: four years of college Russian. For graduate students only.

Hours to be arranged. S. Paperno, L. Paperno.

The course is designed for graduate students who specialize in an area of Russian studies requiring fine active control of the language. Students will have an opportunity to speak formally and informally on topics in their specialty. Fine points of syntax, usage, and style will be discussed.

[651–652 Comparative Slavic Linguistics 651, fall; 652, spring. 4 credits each term. Prerequisites: for Russian 651, permission of instructor; for Russian 652, Russian 651 or permission of instructor. Not offered 1986–87. Hours to be arranged. E. W. Browne.

Sounds and forms of the Slavic languages and of prehistoric common Slavic; main historical developments leading to the modern languages.]

700 Seminar in Slavic Linguistics Offered according to demand. Variable credit.

Staff.

Topics chosen according to the interests of staff and students.

Literature

103 Freshman Seminar: Classics of Russian Thought and Literature Fall or spring. 3 credits.

M W F 11:15, T R 12:20–1:35. Staff.

Russian society has always seen its literature as having a mission important to the development of the nation. In this course we will examine Russian literature as it participates in the debate, whether Russia? We will look in particular at the conflict between the Slavophiles, those who thought Russia had its own unique destiny, and the Westernizers, those who thought Russia should look to the West for modern development. We will be reading such Russian authors as Turgenev, Dostoevsky, Herzen, and Solzhenitsyn in English translation. The course will examine the rhetorical means each author uses to make his argument.
104 Freshman Seminar: Nineteenth-Century Russian Literary Masterpieces Fall or spring. 3 credits.
Fall: M W F 9:05 or 1:25. Spring: M W F 1:25.
P. Carden and staff.
This course will introduce students to a broad selection of the major works of the Russian literary tradition. Our emphasis will be on what makes each work interesting as a text, what parallels it has with modern times, and how we recognize the distinctive voice of each of the writers we are studying. Among the authors read are Pushkin, Gogol, Turgenev, Dostoevsky, Tolstoy, and Chekhov. All reading is in English translation.

105 Freshman Seminar: Twentieth-Century Russian Literary Masterpieces Spring. 3 credits.
M W F 12-20. Staff.
Russian literature in the twentieth century has endured many ups and downs. At times it has produced great masterpieces of modern art. At times it has been forced into the dry mode of "socialist realism," in which it had to voice the ideas forced upon it by a totalitarian government. Russian authors have been glorified as the voice of the nation, and they have also perished in concentration camps in the far north of Siberia. In this course we will read a representative selection of these authors, including those who took the path of art, those who bent to the "social command," and those who assumed a politically distant stance. Among the authors read will be Babel, Pasternak, Olesha, and Solzhenitsyn. All reading in English translation.

107 Freshman Seminar: Writers on Writing Fall or spring. 3 credits.
T R 2:30–3:45. Staff.
Why do we write or read? The centrality of reading and writing in our lives evidences our dependence on language. Both processes paradoxically mirror and create reality. We will examine how writers of nineteenth- and twentieth-century Russian literature from Gogol to Olesha portray reading or writing processes in their works, and with the help of selections from Schiller, Poulet, Sartre, and others, we will analyze how and why we read and write.

201–202 Readings in Russian Literature 201, fall; 202, spring. 3 credits each term.
Prerequisite: qualification in Russian. Open to freshmen. Formal requirements: daily homework sheets, occasional quizzes on vocabulary with questions on the texts in Russian and English, and one semester paper (10–12 pages) to be written in English on a topic of the student's choice.
Designated as the first literature course taken entirely in Russian—both readings and class discussions. But daily assignments are short and considerable guidance is provided; there is no presumption of fluency. The goals of the course are to introduce students to major genres (lyric poetry, fairy tale, drama, narrative prose); to sample widely differing literary works and, with the help of selections from Schiller, Poulet, Sartre, and others, we will analyze how and why we read and write.

[307 Themes from Russian Culture Fall. 4 credits.
Russia is a difficult culture to understand because it has been, at least until the twentieth century, two cultures: a Westernized elite and a vast, conservative Orthodox peasantry. The rift between what was "natively Russian" and what was borrowed from the West created for the educated classes a major crisis in identity. Where did Russia belong? It was a borderline culture, both East and West, and one reaction to that insecurity was to distrust or parody both sides of the border. Many of the greatest works of Russian culture are produced as an attempt to bring these cultures together: Tolstoy and Dostoevsky in literature, Mussorgsky in music, Repin in visual art. This course begins by sampling the traditional aspects of Russian culture—folktales, early chronicles, lives of the saints, and religious art (such as church chant). We will then consider the transition to more Westernized forms, beginning in the eighteenth century, and the crises this provoked. Subsequent readings are organized around three recurrent themes: the experience of the city (Petersburg), the displaced intellectual (Russia's "superfluous men"), and the search for meaningful biography—which is linked, on a larger scale, with Russia's search for an identity in history. The basic texts are literary works of moderate length (no huge novels). Discussions are occasionally illustrated with slide shows and music. Class participation is crucial.

308 Themes from Russian Culture Spring. 4 credits.
No prerequisites. Requirements: regular attendance and class participation; two in-class midterms; one semester paper, which may be rewritten in place of a take-home final exam.
M W F 1:25. C. G. Emerson.
The major theme is literary realism: How have Russian and Soviet writers, in the last one hundred years, attempted to tell the truth? In readings by Tolstoy (nineteenth-century critical realism), Chekhov, Babel, Olesha, Zamyatin, Bulgakov (fantastic realism), Sholokhov and Gladkov (socialist realism), and Solzhenitsyn. Supporting these will be the liberating (and later enslaving) effect of the Revolution, the politicization of Russian literature, and various competing theories of realism as a mode of art. Background lectures in social and political history provided.

329 Eastern Europe Today: Economics, Government, Culture (also Economics 329 and Government 326) Spring. 4 credits.
Introductory interdisciplinary survey of Poland, Hungary, Czechoslovakia, and Yugoslavia since World War II, with emphasis on contemporary developments. The goals of the course are to examine differences and similarities among East European countries as well as common elements.

Not offered 1986–87
Introductory survey of the U.S.S.R. since the Revolution, with emphasis on contemporary developments.

331 Russian Poetry Fall. 4 credits.
Requirements: Russian 202 or equivalent, and permission of the instructor. This course may be counted towards the 12 credits of Russian literature in the original language for the Russian major. Also open to graduate students.
A survey of Russian poetry with primary emphasis on analysis of individual poems by major poets.

332 Russian Theatre and Drama Not offered 1986–87.
333 The Russian Short Story Not offered 1986–87.
350 Tolstoy and the Disciplines (also College Scholar 350) Not offered 1986–87.

367 The Russian Novel Spring. 4 credits.
Also open to graduate students. There will be a special discussion section for students who read Russian. Not offered 1986–87.
Study of the major Russian prose writers of the nineteenth and twentieth centuries. Novels and short stories by Gogol, Turgenev, Tolstoy, Dostoevsky, Chekhov, Solzhenitsyn, and others.

368 Soviet Literature Spring. 4 credits. Also open to graduate students. There will be a special section for students who read Russian. Not offered 1986–87.
M 2:30–4:30 plus one hour to be arranged. Staff.
Selected works of Russian literature, 1917 to date, examined primarily as works of art, with some attention to their social, political, and historical importance. Mayakovsky, Babel, Pasternak, Solzhenitsyn, and others. In English translation.

369 Dostoevsky (also Comparative Literature 383) Fall. 4 credits.
W 2:30–4:30 plus one hour to be arranged. Staff.
An introduction to the work of Dostoevsky in English translation. Notes from the Underground, The House of the Dead, Crime and Punishment, The Idiot, The Devils, and The Brothers Karamazov will be read and discussed in terms of their literary qualities and their significance for the cultural history of Russia.

373 Chekhov Fall. 4 credits. A special section is offered for students who read Russian. Not offered 1986–87.
T R 2:00–3:15. S. Senderovich.
Reading and discussion of Chekhov's works, with emphasis on the short story. The course is designed for nonspecialists as well as literature majors. A variety of approaches will be employed; informal lectures and discussions.

379 The Russian Connection (also Comparative Literature 379) Spring. 4 credits.
M W F 10:10. P. Carden.
We will examine the development of a Russian psychological literature of the interior self in its interrelationship with European literature. Using early examples of psychological prose such as Rousseau's Confessions and Benjamin Constant's Adolphe, we will examine the connection to Russian prose of the romantic period in Pushkin's Queen of Spades and Leverov's Hero of Our Time. We will compare Hoffmann's and Gogol's employment of the fantastic to probe the more obscure sides of the psyche. After reading Stendhal's Charterhouse of Parma, we will turn to two of the most significant psychological novels of the Russian tradition, Tolstoy's War and Peace and Dostoevsky's The Idiot. All reading is in English translation.

387 Teaching and Learning: Ideas of Education in the Western Tradition (also Comparative Literature 387) Spring. 4 credits.
M 2:30–4:30, plus one hour to be arranged.
P. Carden and guest lecturers.
Education is a central theme in our cultural tradition. What makes a person educated? Should a child be shaped to benefit society or to benefit some notion of his own good? What makes a good teacher? Should we have schools and, if so, what kind? What role should the state play in determining what to teach and how it should be taught? These questions are fundamental to our philosophical discourse from Plato to Rousseau. Fiction takes school and learning as primary subjects, and narrative has developed under the influence of the pedagogical discourse; public policy is shaped by the debate over teaching and learning. Writing shapes education, both as a vehicle of pedagogical discourse and as a necessary practice at every level of education. These topics will be the focus of our discussion as we look at a number of texts from the philosophical, literary, and public policy discourse.
418 Pedagogy and the Nineteenth-Century Novel (also Comparative Literature 418) Fall. 4 credits. Prerequisites: Russian 202 or equivalent. Recommended: a course at the 300 or 400 level in which reading has been done in Russian. This course may be counted towards the 12 credits of Russian literature in the original language required for the Russian major. Not offered 1986–87. T R 2:30–3:45. Staff.

The course is designed to improve the reading facility of advanced undergraduates and beginning graduate students by reading the novels and works of Russian literature in the original and paying close attention to their stylistic qualities. Works of contemporary Russian authors, both those officially approved and dissidents, those of the Soviet Union and those in emigration, will be read.

421 Contemporary Russian Prose Fall. 4 credits. Prerequisites: Russian 202 or equivalent, and permission of instructor. This course may be counted towards the 12 credits of Russian literature in the original language for the Russian major. Also open to graduate students. M W F 11:15- G. Gibian. Slinavsky-Tertz, Solzhenitsyn, Aksyonov, and other Soviet and émigré writers of the last two decades.

423 Pushkin Spring. 4 credits. Prerequisites: Russian 202 or equivalent, and permission of instructor. This course may be counted towards the 12 credits of Russian literature in the original language for the Russian major. Also open to graduate students. T R 12:20–1:35. S. Senderovich.

Reading in the original language and discussion of selected works by Pushkin: lyrics, narrative poems, and Eugene Onegin.


624 Russian Romanticism Fall. 4 credits. Taught in Russian. A survey of concepts, themes, genres, and main individual contributions in Russian literature of the Age of Romanticism.

625 Russian Realism Fall. 4 credits. Also open to advanced undergraduates with permission of instructor. Not offered 1986–87. T 4-6. S. Senderovich.

A study of the development of psychological realism in Russian prose of the nineteenth century, with some attention to the poetic tradition. In addition to reading representative works, we may pay attention to the historical background of the period. We will approach the works through the critical writings of several important theorists, in particular those of Lydia Ginsburg.

[670 Bakhtin and the Russian Formalists (also Comparative Literature 670) Spring. 4 credits. Open to advanced undergraduates with permission of instructor. Not offered 1986–87. W 3:35- C. G. Emerson. The Russian literary critic Mikhail Bakhtin has become, in the past several years, an important new presence in Western criticism. Bakhtin’s work on Dostoievsky, Rabelais, Goethe, the history of the novel, and the philosophy of language has proved remarkably translatable into other cultural and disciplines. This course will consider the Bakhtin legacy in the light of its originating context, the Soviet 1920s, and focus on the polemical dialogue Bakhtin pursued with major intellectual currents of his time: Marxist, formalist, Freudian, socialist-realist. The usefulness of Bakhtin’s methods and categories for Western criticism will then be contrasted with Bakhtin’s curious fate in the Soviet Union as cult figure, claimed by both Stavovphil neoclassicists and contemporary semioticians. ]

671 Graduate Seminar Fall. 4 credits. Also open to advanced undergraduates. W 3:35–5:35. C. Emerson. Topic: intellectual foundations of nineteenth-century Russian literature. The course will investigate, in a roughly chronological framework, the major institutions and philosophical currents that both shaped nineteenth-century writers and were shaped by them. Readings include fiction proper, journalism, ideological treatises, and critical reviews and feature such figures as Rachkovsky, Khomiakov, Chaadaiev, Dobrolyubov, Chernyshevsky, Herzen, Grigorov, Strakhov, the Stanov brothers, and the polemical essays of Dostoievsky and Tolstoy. Secondary readings draw on the socio-literary work currently being done by Lomot and Uspensky in the U.S.S.R., and in the West by Jeffrey Brooks and William Mills Todd. The course aims to provide students with a philosophical continuum for placing nineteenth-century literature in the context of its own social, political, and cultural phenomenon. While building on the basic information available from a Russian history course, it emphasizes the literary aspects of ideology and the interaction between artistic expression and the social deed.

700 Graduate Seminar: Neglected Masterpieces of Short Russian Prose Spring. 4 credits. R 3:35–5:35. G. Gibian. Nineteenth- and twentieth-century works that will be chosen according to the needs of the students enrolled. Stress on skills useful in teaching Russian literature.

[701 Proseminar: Methods in Research and Criticism Not offered 1986–87.]

Courses in English

103 Freshman Seminar: Classics of Russian Thought and Literature

104 Freshman Seminar: Nineteenth-Century Russian Literary Masterpieces

105 Freshman Seminar: Twentieth-Century Russian Literary Masterpieces

107 Freshman Seminar: Writers on Writing

308 Themes from Russian Culture
329 Eastern Europe Today: Economics, Government, Culture (also Economics 329 and Government 326)

387 Teaching and Learning: Ideas of Education in the Western Tradition (also Comparative Literature 387)

388 Ideas and Form in Novels of Social Inquiry (also Comparative Literature 388)

418 Pedagogy and the Nineteenth-Century Novel (also Comparative Literature 418)

Courses in Russian

201–202 Readings in Russian Literature

331 Russian Poetry

393 Honors Essay Tutorial

431 Contemporary Russian Prose

432 Pushkin

491 Russian Literature in the Original Language

492 Supervised Reading in Russian Literature

611 Supervised Reading and Research

621 Old Russian Literature

624 Russian Romanticism

671 Intellectual Foundations of Nineteenth-Century Russian Literature

672 Tolstoy's Artistic Career through Voina i mir

700 Neglected Masterpieces of Short Russian Prose

Sanskrit

See Linguistics 641–642.

Serbo-Croatian

131–132 Elementary Course

131, fall; 132, spring.

3 credits each term. Prerequisite for Serbo-Croatian 132: Serbo-Croatian 131 or equivalent.

Hours to be arranged. E. W. Browne.

133–134 Continuing Course

133, fall; 134, spring.

3 credits each term. Prerequisites: for Serbo-Croatian 133; Serbo-Croatian 132 or equivalent; for Serbo-Croatian 134, Serbo-Croatian 133 or equivalent.

Hours to be arranged. E. W. Browne.

Sinhala (Sinhalese)

101–102 Elementary Course

101, fall; 102, spring.

6 credits each term. Prerequisite for Sinhala 102: Sinhala 101 or equivalent.

Hours to be arranged. J. W. Gair and staff.

A semi-intensive course for beginners. A thorough grounding is given in all the language skills: listening, speaking, reading, and writing.

201–202 Sinhala Reading

201, fall; 202, spring.

3 credits each term. Prerequisites: for Sinhala 201, qualification in Sinhala; for Sinhala 202, Sinhala 201 or equivalent.

Hours to be arranged. J. W. Gair and staff.

203–204 Composition and Conversation

203, fall; 204, spring. 3 credits each term. Prerequisites: for Sinhala 203, Sinhala 202 or permission of instructor; for Sinhala 204, Sinhala 203 or equivalent.

Hours to be arranged. J. W. Gair and staff.

Related Courses

See also Linguistics 341, 442, 631, 640, 641.

Spanish


The Major

The major is designed to give students proficiency in the oral and written language, to acquaint them with Hispanic culture, and to develop their skill in literary and linguistic analysis. Satisfactory completion of the major should enable students to meet language and literature requirements for teaching, to continue with graduate work in Spanish, or to satisfy standards for acceptance into the training programs of the government, social agencies, and business concerns. A Spanish major combined with another discipline may also allow a student to undertake preprofessional training for graduate study in law or medicine. Students interested in a Spanish major are encouraged to seek faculty advice as early as possible. For acceptance into the major, students should consult one of the directors of undergraduate studies in Spanish—Professor Vernon, for literature (273 Goldwin Smith Hall), or Professor Guy for language and linguistics (Mornell Hall)—who will admit them to the major, and choose an adviser from the Spanish faculty of either the Department of Romance Studies or the Department of Modern Languages and Spanish. Spanish majors will then work out a plan of study in consultation with their advisers. Previous training and interests as well as vocational goals will be taken into account when the student's program of courses is determined.

Spanish 201 and 204 or 212 (or equivalent) are prerequisite to entering the major in Spanish. All majors will normally include the following core courses in their programs:

1) two literature courses of the 315–316–317 series
2) 311 and 312 (or equivalent)

Spanish majors have great flexibility in devising their programs of study and areas of concentration. Some typical options of the major are:

1) Spanish literature, for which the program of study normally includes at least 24 credits of Spanish literature beyond the core courses. Literature majors are strongly urged to include in their programs courses in all the major periods of Hispanic literature.

2) Spanish linguistics, for which the program normally includes 401, 407, 408, and at least 12 additional credits in general or Spanish linguistics. (Linguistics 101–102 are recommended before entering this program.) Students interested in including linguistics in their programs should consult with the director of undergraduate studies for the Department of Modern Languages and Linguistics (Professor G. Guy).

3) A combination of literature and linguistics.

4) Any of the above options with certain courses in other disciplines counted towards the major. We encourage students to opt for Spanish-related themes. Intended for those students who are preparing themselves for medical and health professions.

Honors in Spanish may be achieved by superior students who wish to undertake guided independent reading and research in an area of their choice. Students in the senior year select a member of the Spanish faculty from either the Department of Romance Studies or the Department of Modern Languages and Linguistics to supervise their work and direct the writing of their honors essays (see Spanish 429–430).

Feas. Depending on the course, a small fee may be charged for copies of texts for course work.

Language and Linguistics

121–122 Elementary Course

121, fall; 122, spring.

4 credits each term. Prerequisite for Spanish 122: Spanish 121. Special sections of this course are available for students with qualification in another language. Intended for beginners or students placed by examination. Students who obtain a CPT achievement score of 550 after Spanish 121–122 attain qualification and may enter the 200-level sequence; otherwise Spanish 123 is required for qualification.

LeC. R 12:20 or 2:30; F 11:15 or 1:25; drills, M–R 8, 9:05, 10:10, 11:15, 12:20, 1:25, 2:30, or 3:35. Evening prelims. Fall, 7:30 p.m., Oct. 28, spring, 7:30 p.m., March 12. M. N. Nemethy.

A thorough grounding is given in all language skills: listening, speaking, reading, and writing. Language practice is in small groups. Lecture covers grammar, reading, and cultural information.

123 Continuing Spanish

Fall, spring, or summer.

4 credits. Limited to students who have previously studied Spanish and have a CPT achievement score between 450 and 559. Satisfactory completion of Spanish 123 fulfills the qualification portion of the language requirement.

Fall: lec, M 10:10 or 1:25; drills, T–F, 9:05, 10:10, 11:15, 12:20, 1:25, or 2:30. Spring: lec, M 10:10 or 1:25; drills, T–F 9:05, 10:10, 11:15, or 12:20. Evening prelims. Fall, 7:30 p.m., Oct. 7 Nov; spring, 7:30 p.m., March 3. J. Router.

An all-skills course designed to prepare students for study at the 200-level.

123.1 Special section for commercial Spanish.

Fall. Prerequisite: permission of instructor.

T–F–W. J. Router.

Same as Spanish 123 but with emphasis on commercial Spanish.

Note: Students placed in the 200-level courses have the option of taking language and/or literature courses; see the listing under Spanish 201 for a description of the literature course that may be taken concurrently with the 203–204 or 211–212 language courses described below.

203 Intermediate Composition and Conversation

Fall, spring, or summer. 3 credits. Prerequisite: qualification in Spanish.

Fall: M W F 8, 9:05, 10:10, 11:15, 12:20, 1:25, or 2:30; Spring: M W F 8, 9:05, 10:10, 12:20, 1:25, or 2:30. Evening prelims. Fall, 7:30 p.m., Oct. 9, spring, 7:30 p.m., March 10. E. Dozier.

Conversational grammar review with special attention to the development of accurate and idiomatic oral expression. Includes readings in contemporary Spanish prose and practice in writing.

203.4 Special section for medical and health professions.

Spring. Permission of instructor necessary.

Fall: M W F 9:05; Spring: M W F 1:25. M. Rice.

Same as Spanish 203 but with emphasis on health-related themes. Intended for those students who are preparing themselves for medical and health professions.

Special section for hotel Spanish (see Hotel Administration 267). Spring. Prerequisite: permission of instructor.

M. W. F. hours to be arranged. E. Dozier.

Same as Spanish 203 but with emphasis on vocabulary related to the hospitality industry.
204 Intermediate Composition and Conversation
Fall or spring. 3 credits. Prerequisite: Spanish 203 or permission of instructor.

- Fall: M W F 9:05 (204.1: for bilinguals only), 12:20, or 1:25. Spring: M W F 9:05, 10:10, 11:15, 12:20, or 1:25. Z. Iguna.
- Practice in conversation with emphasis on improving oral and written command of Spanish. Includes treatment of specific problems in grammar, expository writing, and readings in contemporary prose.

[211 Intermediate Spanish 3 credits. Not offered 1986–87]

[212 Intermediate Spanish 3 credits. Not offered 1986–87]

310 Advanced Conversation and Pronunciation
Spring. 2 credits. Prerequisite: Spanish 204 or equivalent.

M W F 9:05. Z. Iguna.

311 Advanced Composition and Conversation
Fall. 4 credits. Prerequisite: Spanish 204 or 212, or equivalent.

M W F 11:15 or 12:20. Staff.
- Advanced language skills, developed through reading, grammar review, and intensive practice in speaking, writing, and translation. Analysis of present-day Spanish usage in a wide variety of oral and written texts.

312 Advanced Composition and Conversation
Spring. 4 credits. Continuation of Spanish 311 but may be taken separately Required of Spanish majors.

M W F 10:10 or 12:20. Staff.
- Readings and class discussion will focus on the stylistic analysis of modern texts. Increased emphasis, through weekly essays, on students' development of an effective Spanish prose style.

[401 History of the Spanish Language Fall. 4 credits. Prerequisite: Linguistics 101 and qualification in Spanish, or permission of the instructor. Not offered 1986–87]

M W F 9:05. Staff.
- A historical analysis of the phonology, morphology, syntax, and lexicon of the Spanish language up to the seventeenth century. Selected medieval documents are read and discussed.

[407 Applied Linguistics: Spanish Fall. 4 credits. Prerequisites: qualification in Spanish and Linguistics 101, or permission of instructor.

- Designed to equip the teacher of Spanish with the ability to apply current linguistic theory to second-language learning.

[408 The Grammatical Structure of Spanish Spring. 4 credits. Prerequisites: qualification in Spanish and Linguistics 101 or permission of instructor. Not offered 1986–87]

- Survey of the salient morphological and syntactic characteristics of contemporary Spanish.

601 Hispanic Dialectology Fall, according to demand. 4 credits.

Hours to be arranged. Staff.
- Survey of dialects of Latin America and the Caribbean.

[602 Linguistic Structure of Ibero-Romance Fall or spring, according to demand. 4 credits. Not offered 1986–87.

Hours to be arranged. Staff.
- Phonological, morphological, and syntactic characteristics of the Romance languages (Catalan, Galician, Portuguese, Sephardic) and of the main dialects of the Iberian Peninsula, studied in relation to each other and to Castillian Spanish.

[603 Contemporary Theories of Spanish Phonology Fall or spring, according to demand. 4 credits. Not offered 1986–87.

Hours to be arranged. Staff.
- The sounds of Spanish analyzed according to Prague, structuralist, generative, and natural (generative theory).
440 Medieval Spanish Literature

A reading of the most important texts in the different genres. An attempt at defining the very concept of genre and its applicability to medieval works. Exploration of concepts such as courtly love. Incorporation of Spanish texts into their philosophico-theological background. French and Italian parallels.

455 Cervantes: Don Quijote

Fall. 4 credits. Taught in Spanish.


Close reading of Cervantes' masterpiece. Discussions will consider the text as a mirror of its historical moment, of its self-conscious author, and of its readers' search for meaning.


488 The Novel in Early Twentieth-Century Spain


Representative prose fiction works by Unamuno, Baroja, Azorín, and Valle-Inclán will be studied in detail as examples of the Spanish manifestation of artistic revolution at the beginning of the twentieth century. Discussion will include issues such as the struggle against traditional genre limitations, the search for new narrative forms, art as game, the self-reflexive text, and narrative theory.

[489] Hispanic Romanticism 4 credits. Not offered 1986–87]


[499] Borges (also Comparative Literature 499) 4 credits. Not offered 1986–87]

639–640 Special Topics in Hispanic Literature

639, fall; 640, spring. 4 credits each term.

Staff.

667 Seminar in Golden Age Literature 4 credits. Not offered 1986–87]

690 Graduate Seminar: Baroque and Neobaroque

Fall. 4 credits.


The tensions and complications of Hispanic literary history will be examined through a broad spectrum of reading culled from three of its privileged moments: the baroque age in Europe and the Indies, the Spanish Generation of 1927, and the contemporary neobaroque in Cuban literature. Following an intensive reading of a few representative early works (Polifemo, Primero Suero, Vida del Buscon) we will discuss selected works by modern Peninsular and Cuban authors: Diego, Lorca, Alonso, Salinas, Carpenter, Lezama Lima, Cabrera Infante, and Sarduy. Additional readings from the history and theory of the baroque problem (Ortega, D'Ors, Wolfflin, Wellek, and Benjamin) will complement our discussions.

[693] Seminar in Modern Spanish Literature 4 credits. Not offered 1986–87]

695 The Language of Memory in Modern Hispanic Narrative

Spring. 4 credits. Taught in Spanish.


A seminar devoted to the analysis of memory as a narrative medium in selected Hispanic novels. On the basis of a series of theoretical (Bergson, Freud, Nietzsche) and novelistic (Proust, Faulkner) readings, we will seek to identify a repertoire of the narrative functions and representations of memory to be explored in a specifically Hispanic context in novels by García Márquez, Benet, and Marse.

Swahili

See Africana Studies and Research Center.

Swedish

131–132 Elementary Course

Fall; 132, spring. 3 credits each term. Prerequisite for Swedish 132, Swedish 131 or equivalent.

T R 8:30–9:45. L. Tranick.

The aim of this course is to develop skill in reading, although some attention will be devoted to speaking and listening comprehension.

133–134 Continuing Course

Fall; 134, spring. 3 credits each term. Prerequisites: for Swedish 133, Swedish 132 or equivalent; for Swedish 134, Swedish 133 or equivalent.

Hours to be arranged. L. Tranick.

Continues developing skills in spoken and written Swedish.

Tagalog

101–102 Elementary Course

Fall, 102, spring. 6 credits each term. Offered according to demand. Prerequisite: permission of instructor. Prerequisite for Tagalog 102: Tagalog 101.

Hours to be arranged. J. U. Wolff.

201–202 Tagalog Reading

Fall, 202, spring. 3 credits each term. Prerequisites: for Tagalog 201, Tagalog 202 or equivalent; for Tagalog 202, Tagalog 201 or equivalent.

Hours to be arranged. J. U. Wolff.

[300 Linguistic Structure of Tagalog Fall or spring. 4 credits. Prerequisite: Linguistics 101. Not offered 1986–87]

Tamil

101–102 Elementary Course

Fall, 102, spring. 6 credits each term. Offered according to demand. Prerequisite for Tamil 102, Tamil 101 or equivalent.

Hours to be arranged. J. W. Gair.

Telugu

101–102 Elementary Course

Fall, 102, spring. 6 credits each term. Prerequisite for Telugu 102, Telugu 101 or equivalent.

Hours to be arranged. G. Kelley.

201–202 Telugu Reading

Fall, 202, spring. 3 credits each term. Prerequisites: for Telugu 201, qualification in Telugu; for Telugu 202, Telugu 201 or equivalent.

Hours to be arranged. G. Kelley.

See also Linguistics 341, 440.

Thai

101–102 Elementary Course

Fall, 102, spring. 6 credits each term. Prerequisite for Thai 102, Thai 101 or equivalent. Intended for beginners or students placed by examination.

Hours to be arranged. Staff.

A thorough grounding is given in all the language skills: listening, speaking, reading, and writing.

201–202 Thai Reading

Fall, 202, spring. 3 credits each term. Prerequisites: for Thai 201, qualification in Thai; for Thai 202, Thai 201 or equivalent.

Hours to be arranged. Staff.

203–204 Composition and Conversation

Fall, 204, spring. 3 credits each term. Prerequisites: for Thai 203, qualification in Thai; for Thai 204, Thai 203 or equivalent.

Hours to be arranged. Staff.

301–302 Advanced Thai

Fall, 302, spring. 4 credits each term. Prerequisites: Thai 201–202 or equivalent.

Hours to be arranged. Staff.

Selected readings in Thai writings in various fields.
trainees by members of the faculty. Students from all colleges and departments of the University join with music majors in all of these ensembles: Cornell Symphony Orchestra, Cornell Chamber Orchestra, Cornell Symphonic Band, Cornell Wind Ensemble, Small wind and brass ensembles, Collegium Musicum, Cornell Gamelan Ensemble, Chamber music ensembles, Cornell Chorus, Cornell Glee Club, Chamber Singers, Sage Chapel Choir, Cornell Jazz Ensemble.

Information about requirements, rehearsal hours, and prerequisites for academic credit can be found in the following listings for the Department of Music. Announcements of auditions are posted during registration each fall term and, where appropriate, each spring term as well.

The Department of Music and the Faculty Committee on Music sponsor nearly one hundred formal and informal concerts each year by Cornell’s ensembles, faculty, and students and by distinguished visiting artists. A special feature is the annual Cornell Festival of Contemporary Music. The great majority of concerts are free and open to the public. Lectures and concerts are listed in special monthly posters and the usual campus media.

Nonmajors

In addition to its performing, instructional, and concert activities, the department offers numerous courses for nonmajors, many of which carry no prerequisites and presuppose no previous formal training in music. Consult the following course listings, and for further information apply to the department office, 125 Lincoln Hall (255-4097), or to the director of undergraduate studies, Professor Martin Hatch.

The Major

Two options are available to the student planning to major in music. Each carries the study of music to an advanced level through the integration of performance, music theory, and music history. Option I is a general course, not necessarily oriented toward eventual graduate or professional work in music. Option II is a more specialized and concentrated program, suitable for students who wish to prepare for graduate or professional work in music.

All students contemplating a major in music under either option should arrange for placement examinations and advising in the department during the orientation period of the freshman year, or earlier if at all possible. Information is available in the department office, 125 Lincoln Hall (255-4097), or from the chairman, Professor Thomas Sokol, 124 Lincoln Hall (255-3671). All students are expected to have chosen an adviser from among the department faculty at the time of application for major status.

Option I presupposes some musical background before entering Cornell. Prerequisites for admission to the major are the satisfactory completion of Music 152, normally by the end of the sophomore year. Prerequisites for admission into the Option I program are previous acceptance as an Option I major and satisfactory completion of Music 252, normally by the end of the sophomore year. Students must apply to the department for formal acceptance as an Option I major. An Option II major concentrates in one of the three areas listed below. For Option II in performance, exceptional promise must be demonstrated, in part by a successful solo recital before the end of the sophomore year.

The requirements for the Bachelor of Arts degree with a major in music under Option II are:

1) completion of all the requirements for Option I, except as noted below, and
2) in addition:
   a) in performance:
      (1) the requirement for four semesters of participation in a musical organization or ensemble is waived (but such majors are expected to participate actively in chamber and other ensembles sponsored by the department);
      (2) six credits in individual instruction in the student’s major instrument, or voice, earned by taking Music 391–392 throughout the junior and senior years.
   b) in theory and composition or in history:
      (1) for two of the four semesters of participation in a musical organization or ensemble, Music 462 or 463 may be substituted;
      (2) twelve additional credits in this area of concentration at the 300 level or above, of which either four may be earned in Music 301 or 302 when taken once for four credits, or eight may be earned in Music 401–402.

Honors

The honors program in music is intended to provide special distinction for the department’s ablest undergraduate majors. To become a candidate for honors in music, a student must be invited by the faculty at the beginning of the second semester of the junior year. As soon as possible thereafter, the student will form a committee of three faculty members to guide and evaluate the honors work. In the senior year the candidate will enroll in Music 401–402, with the chairperson of the honors committee as instructor. Candidates will be encouraged to formulate programs that will allow them to demonstrate their total musical ability. The level of honors conferred will be based on the whole range of the independent work in this program, of which a major part will culminate in an honors thesis, composition, or recital to be presented not later than April 1 of the senior year, and a comprehensive examination to be held not later than May 1.

Distribution Requirement

The distribution requirement in the expressive arts may be satisfied with 6 credits in music, except Freshman Seminars and Music 122. A maximum of 4 credits in Music 321–322 and a maximum of 3 credits in Music 331 through 338 and 441 through 450 may be used to satisfy this requirement.

Facilities

Music Library. The Music Library, in Lincoln Hall, has an excellent collection of the standard research tools. Its holdings consist of approximately ninety thousand books and scores and fifteen thousand records. Particularly noteworthy are the collections of opera scores, librettos, and recordings from all periods; twentieth-century scores and recordings; and the large
383 Music of the Romantic Era  Fall or spring, every third semester. 4 credits. Prerequisite: Music 152 or equivalent.
The same as Music 283, but with an additional hour each week devoted to technical discussion of individual works.

387 Mozart  Fall. 4 credits. Prerequisite: Music 152 or permission of instructor.
T R 1:25–2:40. N. Zaslav.

389 The Study of Non-Western Musics 4 credits. Prerequisite: Music 152 or permission of instructor. Not offered 1986–87.
M. Hatch.


481 Music in Western Europe to Josquin des Pres Fall. 4 credits. Prerequisite: Music 381, 382, or 383, or permission of instructor. Not offered 1986–87.

482 Josquin des Pres to Monteverdi Spring. 4 credits. Prerequisite: Music 381, 382, or 383, or permission of instructor. Not offered 1986–87.

Independent Study 301–302 Independent Study in Music 301, fall; 302, spring. Credit to be arranged. Prerequisite: departmental approval.
Hours to be arranged. Staff.

Honors Program 401–402 Honors in Music 401, fall; 402, spring. 4 credits each term. Limited to honors candidates in their senior year.
Staff.

Musical Performance 321–322 Individual Instruction in Voice, Organ, Harpsichord, Piano, Strings, Woodwinds, Brass, and Guitar The number of places is limited. Prerequisite: successful audition with the instructor. Students may register only with the prior permission of the instructor. Students may register for this course in successive years. For information, consult the music department office, Lincoln Hall.
Lessons without credit: Students may sign up for individual instruction in music performance, with permission of the instructor only, following a successful audition. The fee for one-half-hour lesson weekly, without credit, during the term is $90. For a one-hour lesson or two half-hour lessons without credit the fee is $180. Practice-room fees for six hours weekly are $22 per term for a room with a piano; $7 for a room without a piano; $45 for use of a pipe organ.
Lessons for credit: Students may be registered for individual instruction in music performance, with permission of the instructor only, following a successful audition. The fee for one-half-hour lesson weekly, with credit, during the term is $90. For a one-hour lesson or two half-hour lessons without credit the fee is $180. Practice-room fees for six hours weekly are $22 per term for a room with a piano; $7 for a room without a piano; $45 for use of a pipe organ.
Lessons for credit (Music 321–322). Advanced students, at the sole discretion of the instructor, may earn 2 credits each term for a one-hour lesson (or two half-hour lessons) weekly accompanied by an appropriate practice schedule. For every 4 credits earned in Music 321–322, the student must have earned, or currently be earning, at least 3 credits in Music courses (not including Freshman Seminars, Music 122, 321–322, 331 through 338, 391–392, or 441 through 490); these 3 credits must be earned prior to, or simultaneously with, the first 2 credits in 321–322. The fee for a one-hour lesson (or two half-hour lessons) weekly, for credit, during the term is $335. Practice-room fees for twelve hours weekly are $33 per term for a room with a piano; $10 for a room without a piano; $67.50 for use of a pipe organ.

Fees are non-refundable once lessons begin, even if the course is subsequently dropped.

Music majors receive a scholarship equal to the lesson fee listed above. Members of department-sponsored performance ensembles and organizations may, with permission of the director of the organization, receive a scholarship of up to one-half the Cornell fee for the type of lessons chosen during the term. (These scholarships are intended for lessons in the student’s primary performing medium.)

Under certain conditions students may earn credit for lessons taken outside Cornell (Music 321h–322h).
Arrangements must be made through the Department of Music office. Lesson-fee scholarships apply, when awarded, in the same dollar amounts as those for lessons taken at Cornell.

321a–322a Individual Instruction in Voice 321a, fall; 322a, spring. 2 credits each term.
Hours to be arranged. S. Davenny Wyner.

321b–322b Individual Instruction in Organ 321b, fall; 322b, spring. 2 credits each term.
Hours to be arranged. D. H. R. Paterson.

321c–322c Individual Instruction in Piano 321c, fall; 322c, spring. 1–2 credits each term.
Hours to be arranged. M. Bilson and staff.

321d–322d Individual Instruction in Harpsichord 321d, fall; 322d, spring. 2 credits each term.
Hours to be arranged. D. R. M. Paterson and staff.

321e–322e Individual Instruction in Violin or Viola 321e, fall; 322e, spring. 2 credits each term.
Hours to be arranged. S. Monosoff and staff.

321f–322f Individual Instruction in Cello or Viola da Gamba 321f, fall; 322f, spring. 2 credits each term.
Hours to be arranged. J. Hsu.

321g–322g Individual Instruction in Brass 321g, fall; 322g, spring. 2 credits each term.
Hours to be arranged. M. Stith.

321h–322h Individual Instruction outside Cornell 321h, fall; 322h, spring. 2 credits each term.
Hours to be arranged. Staff.

All the standard orchestral and band instruments and guitar may, under certain conditions, be studied for credit with outside teachers. This course is available primarily for the study of instruments not taught at Cornell and for the use of those who for reasons of space cannot be admitted to Music 321a–g or 322a–g. Prior approval by a member of the faculty in the department is required. For information and a list of approved teachers, consult the department office, 125 Lincoln Hall.

391–392 Advanced Individual Instruction 391, fall; 392, spring. 4 credits each term. Open only to juniors and seniors majoring in music under Option II with concentration in performance and to graduate students. Option II majors whose lessons must be taken outside Cornell may apply to the department for financial assistance towards the cost of lessons, $35 per semester will normally be awarded to such students, and a larger amount may be awarded under certain circumstances. Music 391 is not a prerequisite to 392.

Hours to be arranged. Staff.

Musical Organizations and Ensembles

Students may participate in musical organizations andsembles throughout the year. Permission of the instructor is required, and admission is by audition only, except that the Sage Chapel Choir and the Cornell Gamelan Ensemble are open to all students without audition. Registration is permitted in two of these courses simultaneously, and students may register in successive years, but no student may earn more than 6
Graduate Courses

Open to qualified undergraduates with permission of instructor.

601 Introduction to Bibliography and Research
Fall. 4 credits
M 1:30-4:25. L. Coral.

602 Analytical Technique
Spring. 4 credits.
R 1:30-4:25. J. Webster.
A critical survey of various analytical methods in current use. Frequent analytical assignments and class presentations.

603 Editorial Practice (also Music 685)
Fall. 4 credits. Not offered in 1986–87

622 Historical Performance Practicum
Spring. 4 credits.
The practical application of research in historical performance style.

653 Topics in Tonal Theory and Analysis
Hours to be arranged. S. Stucky.

654 Topics in Twentieth-Century Theory and Analysis
Fall. 4 credits. Not offered 1986–87.

656 Modern Orchestration

657–658 Composition
657, fall; 658, spring.

659–660 Composition
659, fall; 660, spring.
4 credits each term.
T 2:30–4:25. K. Husa and staff.

662 Orchestral Conducting

669–670 Debussy to the Present
669, fall; 670, spring.
W Austin, S. Stucky.

673 Music and Poetry in France: Late Middle Ages and Renaissance (also Music 373 and French 517)
Fall. 4 credits. Not offered 1986–87.
D. M. Randel, E. P. Morris.

677 Mozart: His Life, Works, and Times (also German 757)
Fall. 4 credits. Not offered 1986–87.
N. Zaslaw, S. L. Gilman.

680 Introduction to Ethnomusicology
Fall. 4 credits. Open to graduate students in anthropology, linguistics, psychology, sociology, and other cognate fields with the permission of the instructor. Not offered 1986–87.

681–682 Seminar in Medieval Music
681, fall; 682, spring. 4 credits each term. Not offered 1986–87.

683 Seminar in Renaissance Music
683, fall; 684, spring. 4 credits each term. Not offered 1986–87.
D. Randel.

686 Seminar in Baroque Music
Spring. 4 credits.
Topic for 1986: Monteverdi.

687 Seminar in Classical Music
Fall. 4 credits.
T 2:30–4:25. J. Webster.

690 Seminar in Music of the Romantic Era

691–692 Performance Practice

697–698 Independent Study and Research
697, fall; 698, spring. Credit to be arranged. Hours to be arranged. Staff.

699 Musical Notation
Fall. 4 credits.
N. Zaslaw, K. Husa, J. Hsu, M. Hatch.
An investigation of the limitations of musical notation and its role in forming and transmitting musical culture.
This is not a course in musical paleography.

781–782 Seminar in Ethnomusicology (also Society for the Humanities 413–414)
781, fall; 782, spring. 4 credits each term. Not offered 1986–87.

785–786 History of Music Theory
785, fall; 786, spring. 4 credits each term. Not offered 1986–87. J. Webster.

789 Liturgical Chant in the West
Fall. 4 credits. Not offered 1986–87.

Near Eastern Studies

S. Katz, chairman and director of Program of Jewish Studies; R. Brann, S. Mehrzad (director of undergraduate studies); D. I. Owen (graduate field representative), D. Powers, G. Rendsburg, N. Scharf, A. Susser (Shiloah visiting professor), E. Wolfson (Mellon Fellow)
Joint faculty: L. Babby, M. Bernal, S. Gilman

The Department

The Department of Near Eastern Studies offers courses in the archaeology, history, languages, and literatures of the Near East. Students are encouraged to take an interdisciplinary approach to the cultures of this region that has had such an important impact on the development of our own civilization and that plays so vital a role in today's world community. The department's course offerings treat the Near East from ancient times to the modern period and emphasize methods of historical and literary analysis. Near Eastern Studies also provide the basic courses in the Program of Jewish Studies.

Faculty exchange with the Shiloah Center, Tel Aviv University. The Department of Near Eastern Studies has established a faculty exchange program with the Shiloah Center for Middle Eastern and African Studies at Tel Aviv University. Since spring semester 1982, the department has had a professor visiting from the center to teach a course or courses on the modern Middle East in his or her area of specialty. Courses have included a general survey on the history of the modern Middle East and seminars on Egypt, Saudi Arabia, and the Arab-Israeli conflict.

The Major

The student who majors in Near Eastern Studies may concentrate in one of the following five areas:

1. Near Eastern languages and literatures
2. Ancient Near Eastern studies
3. Judaic studies
4. Islamic studies
5. Contemporary Near Eastern studies

The precise sequence and combination of courses chosen to fulfill the major is selected in consultation with the adviser; all majors, however, must satisfy the following requirements (S-U options not allowed):

1) Qualification in one of the languages offered by the department.
2) Eight NES courses (which may include intermediate and advanced language courses).
3) Four courses in subjects related to the student's concentration, which may, in some cases, be taken outside the department.

Prospective majors should discuss their plans with the director of undergraduate studies before formally enrolling in the department. To qualify as a major, a cumulative grade average of C or better is required.
Study abroad. There are many opportunities for study in the Near East. Cornell has agreements with the University of Haifa, Hebrew University, Tel Aviv University, and the Technion in Israel, and with the American University in Cairo, that will permit students to enroll for a year or a semester in some cases for a semester. Study in regular university courses at Haifa, Hebrew University, and Tel Aviv University will be permitted for students with adequate language preparation; otherwise, students enroll in the Overseas Study Program of the institution. Students attending Technion must take all course work in Hebrew; courses at the American University in Cairo are taught in English. Students planning to study overseas during their junior year should develop language skills during their freshman and sophomore years.

Kibbutz, cosponsored by Cornell University, the University of Michigan, and Emory University. The Kibbutz program is designed for university students in good standing. It is limited to 25 students and will be held at Ef'al Study Center of the Kibbutz Movement in Tel Aviv. Application deadline is April 15, 1987. For further details contact the Department of Near Eastern Studies.

Honors. Candidates for the degree of Bachelor of Arts with honors in Near Eastern languages and literatures, Ancient Near Eastern studies, Judaic studies, or Islamic studies must fulfill the requirements of the appropriate major study and enroll in the honors course, NES 498, in the final semester of their senior year. For admission to the honors program, candidates must have a cumulative average of B+ or better and have demonstrated superior performance in Near Eastern studies courses. Applicants seeking a major adviser, candidates should submit an outline of their proposed honors work to the department during the second semester of their junior year.

Program of Jewish Studies
The field of Jewish studies encompasses a broad spectrum of disciplines that includes language, literature, philosophy, and history. The Department of Near Eastern Studies offers students the opportunity to take a wide variety of courses in Jewish studies whose subjects are not represented in this department. Students interested in planning a program in Jewish studies should consult the Department of Near Eastern Studies. For further details see Program of Jewish Studies under "Special Programs and Interdisciplinary Studies."

Freshman Seminars

115 Literature and Politics in the Middle East Fall 3 credits
T R 2:30-3:45 S. Mehrez.
For the past century or so, the Middle East has provided an almost uninterrupted scene of political and ideological struggle. Revolution, nationalism, war, socialism, radicalism, and fundamentalism have all been part and parcel of the modern history of the Middle East. Where does literature fit into this picture? What is the role of the intellectual in a part of the world where writers cannot afford to "sit back and poke sophisticated irony at one another" or "explore the anguished world of lonely individuals abstracted from time and actual circumstances." Through readings of Middle Eastern literary texts we will explore how writers have participated and continue to participate not so much in "the writing of" but rather in "the making of" history. The course will focus on the production of culture and knowledge.

103 Elementary Hebrew Summer (six-week session). 4 credits. Enrollment limited to 18 students.
M-F 8:30-9:45 S. N. Scharf.
The fundamentals of grammar, syntax, and vocabulary as applied to both conversational and written Hebrew in the modern idiom. Students are expected to know the Hebrew alphabet for the first session of class.

104 Continuing Hebrew Summer (six-week session). 4 credits. Enrollment limited to 18 students.
Prerequisite: one year of Hebrew, modern or biblical.
M-F 10-11:45 S. N. Scharf.
For students who seek to build vocabulary, improve grammar and reading proficiency, and express themselves both in oral and written modern Hebrew.

111-112 Elementary Arabic
111, fall; 112, spring.
6 credits each term. Prerequisite for 112: 111 or permission of instructor.
M-F 12-20, D. S. Powers, spring. S. Mehrez.
The fundamentals of the modern languages: introduction through practice in reading, writing, listening, and speaking. Short selections from all periods of Arabic literature are studied.

121-122 Elementary Classical Hebrew
121, fall; 122, spring; 4 credits each term.
Prerequisite for NES 122: 121 or equivalent permission of instructor. Not offered 1986-87.

125-126 Society, Economy, and Religion in Ancient Israel: King David's Jerusalem
126, fall; 125, spring; 3 credits each term.
T R 8:40-9:55 D. Duell.
An investigation of daily life as it was experienced during the Davidean monarchy. We will make use of the contributions of archaeology of the Old Testament text.

131-132 Introduction to the Turkish Language
(also Turkish 131-132)
131, fall; 132, spring; 3 credits each term. Not offered 1986-87

201-202 Intermediate Modern Hebrew I and II
201, fall; 202, spring; 3 credits each term.
Prerequisites: for NES 201, 102 or permission of instructor; for NES 202, 201 or permission of instructor. Satisfactory completion of NES 202 fulfills the proficiency portion of the language requirement.
M-F 9:30-10:45 M. N. Schick.
Second-year modern Hebrew. Continued development of reading, writing, composition, listening, and speaking skills. (1) Oral comprehension and production: (a) in the classroom—ability to carry on a conversation, listen to a short lecture, or deliver a short lecture on topics covered in the classroom or related topics; (b) in the outside world—ability to interact with speakers of Hebrew and exchange ideas on basic interests and current events, in work or study situations or informal gatherings, and to relay simple information and give directions. (2) Reading: (a) in the classroom—ability to read simple stories, short news items, and newspaper headlines; (b) in the outside world—ability to read short newspaper items, work directions, maps, plans, etc. (3) Writing: (a) in the classroom—ability to write short compositions, take notes in class, compose schedules, write out directions, etc.; (b) in the outside world—ability to write letters, reports and summaries of events, and to complete questionnaires. (4) Culture: expand knowledge of culture into some areas of literature, popular culture, and historical background.

211-212 Intermediate Arabic
211, fall; 212, spring; 3 credits each term.
Prerequisite: one year of Arabic or permission of instructor; for NES 212, 211 or permission of instructor. Not offered 1986-87.

213-214 Egyptian Arabic (also Arabic 213-214)
213, fall; 214, spring; 4 credits each term.
Prerequisite: for NES 214: 213 or permission of instructor. All texts in Roman alphabet. Not offered 1986-87.

221 Readings in Classical Hebrew Literature: The Art of Biblical Narrative
Fall. 3 credits.
Prerequisite: one year of Hebrew, modern or biblical. Not offered 1986-87.

222 Reading in Classical Hebrew Literature
Spring. 3 credits. Not offered 1986-87.

238 Aramaic
Spring. 3 credits. Not offered 1986-87.

271-272 Hebrew for Academic Studies
3 credits.
MWF 11-15. Staff.
The course is designed for both prospective students in an academic institution in Israel and others desirous of additional studies in professional and technical Hebrew. It aims to bridge the transition into an Israeli university setting by improving the following: (1) an understanding of articles in Hebrew and their technical vocabulary, specific to different fields; (2) accurate reading and listening skills; (3) translation and verbal response; (4) understanding and note taking by use of a simulated Hebrew lecture; and (5) language structures. The course will use general articles yet will be tailored as much as possible to individual needs in different fields such as the humanities and the social and natural sciences.

301-302 Advanced Modern Hebrew I and II
301, spring. 302 not offered 1986-87. 4 credits each term. Entire sequence may be repeated for credit.
Prerequisite for NES 301: 202 or equivalent with permission of instructor. Prerequisite for NES 302: 301 or equivalent with permission of instructor. This sequence may be used as literature to fulfill the humanities distribution requirement. Material varies from one year to the next.
Hours to be arranged. R. Brann.
Advanced study of Hebrew through the analysis of literary texts and expository prose. This course employs a double perspective: the language is viewed through the literature and the literature through the language. Students will develop composition skills by studying language structures, idioms, and various registers of style.

[311 Advanced Arabic Fall. 4 credits. Not offered 1986–87]

[312 Advanced Arabic: Classical Historical Texts Spring. 4 credits. Not offered 1986–87]

[333–334 Elementary Akkadian 333, fall; 334, spring. 4 credits each term. Not offered 1986–87]

[335–336 Readings in Akkadian Texts 335, fall; 336, spring. 3 credits. Prerequisite: NES 333–334. Hours to be arranged. D. I. Owen.]

Selected readings in Akkadian texts.

[337 Uguritic Fall. 3 credits. Not offered 1986–87]

Archaeology

[243 The History and Archaeology of Ancient Israel to 450 B.C.E. Spring. 4 credits. Not offered 1986–87]

[261 Ancient Seafaring (also Archaeology 275) Summer. 3 credits. Not offered 1986–87]

[262 Mediterranean Archaeology (also Classics 200) Fall. 3 credits. Not offered 1986–87]

[263 Introduction to Biblical History and Archaeology Summer. 3 credits. Not offered 1986–87]


The transition from food gathering to food production is generally believed to have taken place along the hilly flanks of the Zagros Mountains in western Iran during the tenth millennium B.C.E. By the time that writing was fully developed at the end of the fourth millennium in Sumer (Iraq) and in Egypt, sophisticated agricultural methods and complex irrigation techniques had been introduced throughout the Fertile Crescent. This course will briefly survey the early developmental stages of agriculture up to the introduction of writing. Thereafter it will concentrate on the numerous written and archaeological sources relating to many aspects of agriculture, including the following topics: crop production, irrigation, and food processing. These sources contain evidence for types of crops, planting methods, yields, salinity, crop management, processing of grains, fruits and lumber; dairy production (milk, butter, and cheese); herding (cattle, sheep, and equids); wine and beer production (grapes and barley); food processing (milling, baking, drying, and salting); fishing and fowling; and other varied topics. In addition, we will discuss the social organization of the peasant farmer with respect to public (temples and palace estates) and private (semifree and free) landholders. And finally, we will use the many literary sources of the ancient Near East, including the Bible, to illustrate the rich agricultural imagery that permeated written, oral and symbolic speech, a clear indication of the seminal role that agriculture has played in the Near East to the present.

267 Mediterranean Archaeology (also Classics 219) Fall. 3 credits. TR 10:10–11:25. J. Coleman.

An examination of the archaeological bases of ancient Mediterranean civilization with special focus on contact and interrelationships in the Bronze Age (ca. 3500–1100 B.C.). Topics include the Neolithic of Anatolia, Greece, and the Near East; the rise of civilization in Egypt; the Bronze Age states of Syria-Palestine (Ebla, Ugarit, Byblos, etc.); Cyprus, copper, and the Alasia question; the Hittites and Bronze Age Anatolia; the early Bronze Age in Greece; Minoans, Mycenaeans, and their eastern and western contacts; the Bronze Age in the western Mediterranean; and ancient ships and trade in the late Bronze Age.

[361 Interconnections in the Eastern Mediterranean World in Antiquity Fall. 4 credits. Not offered 1986–87]

[362 The History and Archaeology of Ebla Fall. 4 credits. Prerequisite: Archaeology 100 or any introductory course in ancient history or archaeology. Not offered 1986–87]

[364 Introduction to Field Archaeology in Israel Summer 6 credits. D. I. Owen.

An introduction to archaeological fieldwork—excavation techniques, pottery analysis, and recording. Materials studied will range from the early Bronze Age to the Roman period. Emphasis also on the role archaeology plays in the reconstruction of biblical history and the various approaches used to achieve that reconstruction. On-site supervision will be supplemented by regular lectures on the history, culture, and literature of the peoples whose remains will be exposed. Requirements include regularly assigned readings and two papers. Graduate credit by special arrangement.

[365 The History and Archaeology of the Monarchy from the Death of Solomon to the Destruction of Jerusalem, 922–586 B.C.E. Not offered 1986–87]

[366 The History and Archaeology of the Ancient Near East (also Archaeology 310) Fall. 4 credits. Not offered 1986–87]

[367 The History and Archaeology of Ancient Egypt 4 credits. Fall. TR 12:20–1:35. D. I. Owen.]

A detailed survey of the history and archaeology of Egypt from the prehistoric period to the end of the pharaonic period. Beginning with an introduction to the development of Egyptology, the course will then focus on the continuity of Egyptian history and culture integrated with discussions of the major archaeological discoveries of the last century. Concepts of Egyptian history and civilization. Relevant aspects of the Egyptian language, mythology, religion, art, and architecture will be discussed. The particular role of Egypt in the history and archaeology of Syria-Palestine will be highlighted.

[461 Seminar in Syro-Palestinian Archaeology: The Israelite Conquest of Canaan Fall. 4 credits. Not offered 1986–87]

[463 International Trade, Market, and Politics in the Ancient Near East (also Society for Humanities 425) Fall. 4 credits. Not offered 1986–87]

History

[151 Islamic Civilization Spring. 3 credits. Not offered 1986–87]


This course is designed to provide an introductory overview of Near Eastern society and culture from ancient to modern times for students with little or no previous training. Lectures will focus on four major periods of Near Eastern history: ancient, biblical, Islamic, and modern. Within each historical period we will consider the development of major religious ideas, social and political institutions, economic structures, and literary forms. Readings will be chosen from primary sources in translation and modern secondary materials. In addition, movies, slides, and other visual materials will be used as integral parts of the course.

229 Introduction to Jewish Mysticism Fall. 3 credits. M W F 10:10–10:30. E. Wolfsen.

This course will present a survey of the main currents of Jewish mysticism from the Talmudic period (third to sixth centuries) to the Hasidic movement of eighteenth-century eastern Europe. While attention will be given to the particular nature of each historical period, we will also examine the question of a possible common thread connecting the various manifestations of mysticism within Jewish circles. A comparative analysis with forms of mysticism in other religions, particularly Christianity and Islam, will be employed in order to elucidate both the shared and unique elements of Jewish mysticism. We will discuss such topics as mystical prayer, meditation, magical and theurgical techniques of spirituality, parapsychological states of consciousness, reincarnation, the "feminization" of the divine in medieval kabbalah, and the kabbalistic understanding of the commandments and history.


A detailed examination of the main historical and ideological elements relevant to an understanding of the Nazis' "war against the Jews." Study of modern anti-Semitism, the Weimar Republic, and Hitler's seizure of power open the course. This will be followed by a close reading of Hitler's annihilation policy before 1939, the impact of the world war after 1939; and the successive policies of deportation, ghettoization, and mass murder. Attention will also be given to the moral and theological questions raised by these events.

242 Israel: History and Geography Summer. 10 credits. S. Katz.

This intensive six-week program consists of two-three week sessions. In the first, the group visits and studies the main historical, religious, and contemporary sites of Israel. At each location, the instructor is joined by Israeli archaeologists, academics, and community leaders. The second half of the program takes place in Jerusalem. Participants take two courses. The first, taught by the instructor with distinguished guest faculty, is called "Jerusalem, Past and Present." It integrates classroom instruction with site visits in and around Jerusalem. The first week focuses on the Jerusalem of the biblical and Second Temple era; the second, on historical Christian and Muslim Jerusalem; the third, on contemporary Jerusalem—Jewish, Muslim, and Christian. Special evening cultural activities are scheduled. The second course is selected by participants from the summer session offerings of the Hebrew University. Contact the department for further information.

[243 History and Archaeology of Ancient Israel to 450 B.C.E. Spring. 4 credits. Not offered 1986–87. For description see NES 243 under "Near Eastern Archaeology."]

[245 The Emergence of the Modern Jew, 1648–1948 Spring. 4 credits. Not offered 1986–87]


This course will investigate the claim that "text-centeredness" is the distinguishing feature of Jewish culture. We will begin by examining the process of textual interpretation as it is already implicit in the biblical sources. From the biblical period we will move to the intertestamental and Hellenistic periods, examining such works as the sectarian documents from Qumran, apocalyptic and pseudepigraphic texts, and the Septuagint as well as the allegorical exegeses of Philo. The course will then concentrate on the interpretative techniques of the rabbis, both legal and

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Illuministic in nature, as they are preserved in the standard collections of miqra, and haqqarim, and in the Babylonian and Palestinian Talmuds. We will then examine the hermeneutic strategies adopted by Jewish philosophers in response to the infiltration of Kalam and Islamic Aristotelianism into Jewish circles, on one hand, and as anti-Karaite polemics on the other. We will then consider exegesis as it was developed by the mystics in the twelfth and thirteenth centuries in response to the penetration of gnostic-mythical ideas into Judaism. Exegesis will be examined from the point of view of cultural anthropology, i.e., as a device to absorb and ultimately to internalize outer influences. The underlying assumption of the course is that the making of “the other” one’s own has been an instrumental force in the history of Judaism. The focus of the course then will be to uncover the structures and parameters of Jewish hermeneutics.

248 Introduction to Classical Jewish History Fall. 3 credits.
TR 10:10–11:25. S. Katz. A survey of the major developments in Jewish history between the destruction of the first temple in 586 B.C.E. and the rise of Islam. Topics will include the return under Ezra and Nehemiah; the encounter with Hellenism, the Antiochene persecutions; the growth of Roman influence; the rebellion of 70 C.E.; the rise of such Jewish groups as the Sadducees, Pharisees, and Essenes; the conflict with early Christianity; and the nature of rabbinic Judaism.

249 Introduction to Modern Jewish History Spring. 3 credits.
TR 10:10–11:25. S. Katz. A survey of Jewish developments in Jewish history between the expulsion from Spain (1492) until 1900. Topics will include the growth of mysticism and Hasidism; the development of Eastern European Jewry; the impact of emancipation; the rise of Jewish pluralism, e.g., Reform Judaism, Conservative Judaism, Neo-Orthodoxy; the character of modern anti-Semitism; the origins and growth of American Jewry; and the beginnings of political Zionism.

258 Islamic History 600–1798 Fall. 3 credits. Not offered 1986–87.
[258 Not offered 1986–87.]

261 Ancient Seafaring (also Archaeology 275) Spring. 3 credits. For description see NES 264 under “Near Eastern Archeology.”

264 Agriculture and Society in the Ancient Near East Spring. 3 credits.
For description see NES 264 under “Near Eastern Archeology.”

294 Modern History of the Middle East: Changing Politics, Society, and Ideas (also Government 358) Fall or summer. 4 credits. Fulfills the college distribution requirement in history or the social sciences.
TR 12:20–1:35. A. Susser. This introductory course is designed to acquaint students with the main political, social, and cultural trends that have shaped the modern and contemporary history of the Middle East. While discussing developments in the region during the nineteenth and twentieth centuries, the lectures will focus on such themes as modernization, nationalism, Islamic reaction, and Arab politics in the global and regional contexts. The course does not presuppose the knowledge of Middle Eastern languages.

293 The Jewish Community throughout History Spring. 4 credits. Not offered 1986–87.

346 Jews of Arab Lands Fall. 4 credits.
TR 2:30–3:45. D. Powers. The continuing conflict in the Middle East has made the topic of the historical relations between Jews and Arabs one of urgent significance. The present course seeks to explore the nature of the Jewish experience under Arab rule from the advent of Islam and the Arab conquests (when the majority of world Jewry came under Muslim rule), through the flourishing of Jewish culture during the Islamic High Middle Ages, to the decay of the Muslim world and the rise of the West. Topics to be considered will include the contribution of Judaism to the formation of Islamic civilization; the social, economic, and legal status of Jews living in Arab countries; Judaico-Islamic culture; and mutual perceptions of Arabs and Jews in modern times.

349 Anti-Semitism in Germany and the Jewish Response (also German Literature 349) Spring. 4 credits. Reading knowledge of German helpful, though the basic texts will be read in English.
TR 2:30–3:45. S. L. Gilman. An overview of the history of German anti-Semitism from Luther to Hitler. Readings from political, theological, and literary texts ranging from the Church Fathers (as background to a reading of Luther) to the anti-Semitic literary novels of the nineteenth century to Mein Kampf. Parallel texts will be examined to judge the Jewish intellectual and literary responses to evolving forms of German anti-Semitism.

357 Islamic Law and Society Spring. 4 credits.
TR 2:30–3:45. D. Powers. The Shariah, or sacred law of Islam, embodies the totality of God’s commands that regulate the life of every Muslim in all its aspects. The Shariah comprises on an equal basis ordinances regarding worship and ritual as well as political and, in Western terms, strictly legal rules. This course examines the relationship between the Shariah and the major social, economic, and political institutions of Islamic society. Topics to be discussed will include the status of women, slaves, and non-Muslims; attitudes toward the economy and the arts; the significance of jihadi (holy war); the nature of the Muslim city, and the relationship between the religious establishment and the government. Attention will be given to the function of the Shariah in the modern world, with special reference to the problems and challenges of legal reform.

358 The Islamic Resurgence Spring. 4 credits. Prerequisite: NES 258 or NES 294. Not offered 1986–87.


362 The History and Archaeology of Ebla Not offered 1986–87.


366 Archaeology of the Ancient Near East (also Archaeology 310) Fall. 4 credits. Not offered 1986–87.

376 The History and Archaeology of Ancient Egypt Fall. 4 credits.

398.1 Political Concepts in the Modern Middle East: Religion and State (also Government 352) Spring. 4 credits.
MWF 1:25. A. Susser. The seminar will focus on the problems involved in the application of the nation-state concept in the modern Middle East, religious and ethnic minorities and their impact on domestic politics, and the role of resurgent Islam and its impact on the Arab-Israeli conflict.


Literature

[155 Classics of the Arabic Literary Tradition Fall 4 credits. Not offered 1986–87.]

[204 Masterpieces of Jewish Literature (also Comparative Literature 204) Spring. 4 credits. Not offered 1986–87.]

[205 Masterpieces of Jewish Literature (also Comparative Literature 205) Spring. 4 credits. Not offered 1986–87.]


[208 Modern Hebrew Literature in Translation Spring. 3 credits. Open to freshmen. Not offered 1986–87.]

[221 Readings in Classical Hebrew Literature: The Art of Biblical Narrative Fall. 3 credits. Prerequisite: one year of Hebrew, biblical or modern. May be used as literature to satisfy the humanities distribution requirement. Not offered 1986–87.]


[223 Introduction to the Bible Fall. 3 credits. MWF 10:10–11:20. G. Rendsburg. This course will survey the main historical, religious, and literary issues raised by a close textual reading of the Hebrew Bible (from Genesis to Deuteronomy). It will be concerned with both situating the Bible in its ancient Near Eastern context as well as with discerning its meaning for contemporary reality. All readings will be in English translation.]

[225 Judaic Literature in Late Antiquity: Dead Sea Scrolls and Sectarian Literature Spring. 3 credits. Not offered 1986–87.]

[227 Introduction to the Prophets Fall. 3 credits. MWF 1:25. G. Rendsburg. A close study of the prophetic literature of the Bible. The course will emphasize a close reading of the main prophetic books in order to (a) locate them historically, (b) recognize the uniqueness of the different prophetic personalities and their messages, and (c) engage the profound theological and moral issues they pose.]

[231 The Hebrew Literary Tradition: A Survey (also Comparative Literature 231) Fall. 3 credits. MWF 2:30–3:20. R. Brann. A course in Hebrew literary history from its origins in Israelite antiquity to contemporary Israeli prose and poetry. Selected readings (in translation) trace the development of the Hebrew literary tradition with emphasis on artistic writing (midrash, medieval liturgical and secular poetry, rhymed prose narratives, Renaissance lyric, and early modern and modern Hebrew fiction and verse). The course will examine the interplay between intrinsic poetic and extrinsic influences in Hebrew literary art and consider how later literary schools reread the poetics of the Hebrew Bible.]

[233 The Lyrics of Love and Death: Medieval Hebrew Poetry in Translation Fall. 3 credits. MWF 9:05. R. Brann. An introduction to medieval Hebrew literature: poetry, rhymed prose, and their poetics, from Andalusian Spain to Renaissance Italy. The course will examine the poets’ love of beauty and enchantment with literature. How the poets worked within a highly stylized system of genre conventions, and how themes of love and death derived from parameters of the poets’ literary universe, will be studied in depth.]

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234 Muslim Spain: Literature and Society (also Comparative Literature 234)  Spring. 3 credits.
An introduction to the literature, culture, and society of Muslim Spain from the Umayyad emirate until the close of the Reconquista (711–1248). The course will survey the development of Arabic poetry and its subcultural adaptation in Hebrew with focus on style, genres, and motifs. The course will consider how poetic tastes reflect the shifting sociopolitical climate of Muslim Spain, a frontier society composed of diverse ethnic and religious groups. Conflicting theories of the origin and identity of Hispano-Arabic poetry and culture will also be examined.

236 Israeli Literature in Translation  Spring. 3 credits.
M W F 2:30-3:30. R. Brann.
A series of Israeli literary works in English translation, including novels, short stories, and poems will be read and analyzed. The course will also consider how Israeli literature reflects the clashes between ideology and reality, Eastern and Western cultures, and different sociopolitical structures in Israeli life.

[251 The Modern Arabic Novel  Spring. 3 credits. Not offered 1986–87.]

252 Arabian Nights in the East and the West  Spring. 3 credits.
Some Arabian Nights tales, such as “Sinbad the Sailor” and “Aladdin and the Wonderful Lamp,” have become a part of our own childhood lore, but the whole work is less known or appreciated. In this undergraduate seminar, students will explore three aspects of the Arabian Nights: the aesthetics of the work as viewed from the perspectives of folklore and literary criticism, the place of the Nights in Arabic literature at large, and the impact of the Nights on Western literature. Readings are from the major translations of the Nights and from works of medieval, Renaissance, and modern European authors from Chaucer to Jane Austen and Saul Bellow.

[254 Society, Politics, and the Modern Arabic Novel  Fall. 3 credits. Not offered 1986–87.]

256 A Quest for Identity: The Arabic Short Story  Fall. 3 credits.
After a long period of colonization and cultural isolation, the question of identity becomes very urgent for Middle Eastern writers. Through readings of Arabic fiction in English translation we will explore how Arab writers continue to mold a tradition of short-story writing that reflects (both formally and thematically) a direct engagement in their sociopolitical and cultural context.

[291 Women in Jewish Literature: Tradition and the Literary Imagination (also Women’s Studies 291)  Spring. 3 credits. Open to Freshmen. Not offered 1986–87.]

[292 Women in the Hebrew Bible (also Women’s Studies 292)  Fall. 3 credits. Open to freshmen. May be used for distribution requirements in the humanities, or for a concentration/major in Jewish studies or women’s studies or Near Eastern studies. Not offered 1986–87.]

297 Beyond the Stereotype: Images of Women in the Middle East  Spring. 3 credits. Not offered 1986–87.]

[303 Seminar in Modern Hebrew Literature: The Short Story  Fall. 4 credits. Not offered 1986–87.]


[332 Ancient Near Eastern Literature  Spring. 4 credits. Not offered 1986–87.]

[375 The Shtetl in Modern Yiddish Fiction in English Translation (also German Literature 375)  Fall. 4 credits. Not offered 1986–87.]

[377 Topics in Yiddish Literature (also German Literature 377)  Spring. 4 credits. Not offered 1986–87.]

Special Topics and Independent Study

[341–342 Special Topics in Near Eastern Studies 4 credits. Limited to 25 students; preference will be determined by class standing and prior enrollment in Near Eastern Studies. Not offered 1986–87.]

491–492 Independent Study, Undergraduate Level  Fall or spring. Variable credit. Prerequisite: permission of instructor.
Staff.

499 Honors Seminar: Independent Study  Fall or spring. Variable credit. Prerequisite: permission of instructor.
Staff.

691–692 Independent Study, Graduate Level  Fall or spring. Variable credit. Prerequisite: permission of instructor.
Staff.

Related Courses in Other Departments

Archaeology

Introduction to Archaeology (Archaeology 100)
Introduction to Archaeology (Archaeology 101)
Archaeology as Heritage (Archaeology 105)
Popular Archaeology (Archaeology 107)
The Conquest of Middle and North America (Archaeology 110)
Early People (Archaeology 203)
Archaeological Research Design (Archaeology 301)
Approaches to Archaeology (Archaeology 302)
Stone Age Archaeology (Archaeology 317)
Graduate Seminar in Archaeology (Classics 629)

Economics, Government, and Sociology

Comparative Economics (Economics 368)
Eastern Europe Today (Government 326)
Government and Politics of the Soviet Union (Government 333)


Politics of the Military (Government 349)
Comparative Revolutions (Government 350)
America in the World Economy (Government 354)

[Theories of International Relations (Government 383) Not offered 1986–87.]

[Contemporary American Foreign Policy (Government 385) Not offered 1986–87.]

Sociology of War and Peace (Sociology 310)

History

[History of American Foreign Policy (History 314) Not offered 1986–87.]

[Survey of German History (History 358) Not offered 1986–87.]

[Russian History since 1800 (History 363) Not offered 1986–87.]

[Church and State During the Middle Ages (History 367) Not offered 1986–87.]

Europe in the Twentieth Century (History 383–384)

Jewish Workers in Europe and America (Industrial and Labor Relations 381)

Literature

Christianity and Judaism (Comparative Literature 326)

Literature of the Old Testament (Comparative Literature 328)

Old Testament Seminar (Comparative Literature 421)

New Testament Seminar (Comparative Literature 426)

[Seminar on Biblical Law (Comparative Literature 427) Not offered 1986–87.]

[Difference (Comparative Literature 485) Not offered 1986–87.]

Management

The Environment of International Business in the Middle East (NBA 583)

Nepali

See Modern Languages, Literatures, and Linguistics.

Philosophy


The study of philosophy provides students with an opportunity to become familiar with some of the great ideas and great works in the history of thought while developing analytical skills that are valuable in practical as well as academic affairs. It affords the excitement and satisfaction that come from understanding and working toward solutions of fascinating and important intellectual problems. The curriculum includes substantial offerings in history of philosophy, logic, philosophy of mathematics and science, ethics, social and political philosophy, metaphysics, and theory of knowledge. Any philosophy course numbered in the 100s or 200s is suitable for beginning study in the field. Sections of Philosophy 100 are part of the Freshman Seminar program; they are taught by various members of the staff on a variety of philosophical topics, and because of their small size (eighteen students at most), they provide ample opportunity for discussion. Students who want a broad introduction to philosophy may take Philosophy 101, Philosophical Classics, but many students with special interests may find that the
best introduction to philosophy is a 200-level course in some particular area of philosophy; such courses have no prerequisites and are usually open to freshmen.

The Major

Students expecting to major in philosophy should begin their study of it in their freshman or sophomore year. Admission to the major is granted by the director of undergraduate studies of the department on the basis of a student’s work during the first two years. Eight philosophy courses are required for the major. They must include at least one course in ancient philosophy (210 or 211 or a course with a large component on Plato and/or Aristotle); at least one course in classical modern metaphysics and epistemology (212 or a course on the empiricists, the rationalists, or Kant); and a minimum of three courses numbered above 300, at least one of which must be numbered above 400 (and be other than 490).

A course in formal logic (e.g., Philosophy 231), while not required, is especially recommended for majors or prospective majors.

Philosophy majors must also complete at least 8 credits of coursework in related subjects approved by their major advisers. Occasionally majors may serve as teaching or research aides, working with faculty members familiar with their work.

Honors. A candidate for honors in philosophy must be a philosophy major with a B - or better for all work in the College of Arts and Sciences and an average of B or better for all work in philosophy. In either or both terms of the senior year a candidate for honors enrolls in Philosophy 490 and undertakes research leading to the writing of an honors essay by the end of the final term. Prospective candidates should apply at the philosophy department office, 218 Goldsmith Smith Hall.

Fees

In some courses there may be a small fee for photocopying materials to be handed out to students.

Introductory Courses

These courses have no prerequisites; all are open to freshmen.

100 Freshman Seminar in Philosophy Fall or spring. 3 credits. Fall: M W F 9:05, staff; 10:10, C. Ginat; 11:15, staff; 1:25, H. Hodges; 2:30, staff; T R 10:10, S. Shoemaker; 1:25, N. Kretzmann; 2:30, A. Appiah and staff. Spring: M W F 9:05, staff; 11:15, R. Stalnaker; 1:25, N. Sturgeon; 2:30, staff; T R 10:10, 12:20, 2:30, staff.

101 Introduction to Philosophy Fall, spring, or summer. 3 credits. Sec, T or R 11:15: Fall: M W F 1:25, T. Irwin; spring: T R 10:10, A. Wood.

Readings in classic works of philosophy (such as those of Plato, Aquinas, Descartes, Hume, Mill, Russell) concerned with any of several central philosophical issues—foundations of knowledge, reality and illusion, the mind-body problem, the basis of morality, the existence of God.

131 Logic: Evidence and Argument 3 credits. Not offered 1986-87

145 Contemporary Moral Issues Summer. 3 credits. A philosophical examination of moral issues of widespread contemporary concern. Typical topics are economic inequality, war, racism, sexism, censorship, and abortion.

201 Philosophical Problems Spring. 4 credits. T R 12:20-1:35; C. Ginat.

The course will discuss most, maybe all, of the following well-known puzzles: Zeno's paradoxes of motion (the Racecourse, the Arrow, the Stadium), Zeno's paradox of plurality, the paradox of the heap, the paradox of the liar, the paradox of the surprise examination, the prisoner's dilemma, and Newcomb's problem. These puzzles present us with reasoning that is paradoxical in the sense that although it may seem clear that there must be something wrong with the reasoning, it is not easy to say what it is. Besides being an intriguing exercise in itself, studying such puzzles can show interesting and important things about some of our basic concepts, such as those of space, time, motion, truth, knowledge, rational choice, and causation.

210 Ancient Thought 4 credits. Not offered 1986-87

211 Ancient Philosophy Fall. 4 credits. T R 1-2, G. Fine.

An introduction to ancient Greek and Roman thought— the pre-Socratics; Socrates and Plato; Aristotle; the Stoics, Epicureans, and Skeptics. Topics to be considered include the following: the nature of reality, the nature and limits of knowledge and of sense perception, justice and happiness, the good man and the good life for man, the nature of the soul, the nature of divinity, free will.

212 Modern Philosophy Spring. 4 credits. M W F 10:10, P. Hoffman.

Topic for 1987: history of modern philosophy— Descartes, Spinoza, Berkeley, Hume, and Kant, with emphasis on metaphysics and epistemology. Topics include skepticism, mind-body dualism, idealism, God, free will, and causation.

213 Existentialism Fall. 4 credits. T R 2-3:30, A. Wood.

A study of selected writings, literary as well as philosophical, of four major "existentialist" thinkers in the nineteenth and twentieth-centuries: Kierkegaard, Nietzsche, Dostoevsky, and Sartre.

214 Philosophical Issues in Christian Thought Spring. 4 credits. Not offered 1986-87

215 Medieval Philosophy Fall. 4 credits. Not offered 1986-87

216 Introduction to Formal Logic Fall, spring, or summer. 4 credits. Fall: M W F 10:10, H. Hodges; spring: M W F 10:10, C. Ginat.

Analysis and evaluation of deductive reasoning in terms of formalized languages. The logic of sentences, predicates, and quantifiers. (This course, rather than Philosophy 331, is the recommended introductory formal logic course.)

241 Ethics Spring. 4 credits. M W F 11:15, N. Sturgeon.

Introduction to the philosophical study of moral problems and ethical theories through both historical and contemporary sources. Topics typically include relativism and skepticism, egoism and utilitarianism, and one or more specific moral issues such as the enforcement of morals and obedience to law.

242 Social and Political Philosophy Fall. 4 credits. T R 10:10, R. Miller.

A historical survey of philosophical thinking about the nature and norms of human society, including such questions as the nature and limits of liberty; the function and justification of state authority; the origins of inequality, and the rationale for revolution. Classic works in social and political theory will be discussed in detail in an effort to analyze their main arguments, determining the views of psychology, society, and ethics on which they rest. Topic for 1986-87: liberty, authority and social conflict—individualism and its critics from Hobbes to Marx.

243 Aesthetics Not offered 1986-87

244 Philosophy and Literature Spring. 4 credits. M W 2:30-3:45, A. Appiah.

An introduction to issues in the relations of philosophy and literary theory. Topics will include the nature of fictions, critical evaluation, the concept of structuralism, and the claims of deconstruction.

245 Medical Ethics (also Biology and Society 205 and Biological Sciences 205) Fall or summer. 4 credits. Limited to 50 students. Open to sophomores, juniors, and seniors; permission of instructor required for graduate students. M W F 1:25, plus disc to be arranged. M. Wachsberg.

Critical analysis of the conceptual framework in which ethical problems associated with medicine can be formulated and evaluated. General topics (with sample issues) include basic concepts such as illness, death, autonomy, and personhood (abortion, euthanasia, procreative technologies), allocation of medical resources (entitlement to health care, access to health care, cost-benefit analysis), and the professional-patient relationship (informed consent, confidentiality, medical paternalism).

246 Environmental Ethics (also Biology and Society 206 and Biological Sciences 206) Spring. 4 credits. Open to sophomores, juniors, and seniors; permission of instructor required for graduate students. M W F 1:25, plus disc to be arranged. M. Wachsberg.

Critical analysis of the conceptual framework in which policies affecting the environment are formulated and judged. One major component of the course deals with the nature and extent of obligations to spatially distant humans, future generations, nonhuman animals, and nonsentient things (e.g., the ecosystem). The other major component of the course deals with the appropriate analysis of the origin and resolution of environmental problems. Topics include individual vs. collective goods, cost-benefit analysis, and coordination problems.

251 Knowledge and Reality Fall. 4 credits. M W F 11:15, R. Stalnaker.

An introduction to the central philosophical questions about knowledge. Is it possible to have certain knowledge about the empirical world? What reason do we have to trust the evidence of our senses and memory? How do we justify the principles of evidence and inference that we use to draw conclusions about the past and the future? How is knowledge to be analyzed? What must the world be like for it to be possible for us to know about it?

262 Philosophy of Mind Spring. 4 credits. M W F 9:05, S. Shoemaker.

Discussion of a number of problems about the nature of mind. For example, can thoughts and feelings be physical events in the brain? Might computers or robots be conscious beings? What is it that constitutes a person's identity—the unity of his consciousness? Is there a conflict between free will and determinism?

263 Religion and Reason Fall. 4 credits. T R 10:10, N. Kretzmann.

Recent and traditional literature will be taken into account in the examination of such topics as evidence for and against the existence of a god; philosophical problems associated with the attributes of God as described in the great monotheistic religions; and philosophical problems associated with the relationship of God to the physical universe and to human beings.

266 Science and Human Nature Spring. 4 credits. Not offered 1986-87

Intermediate Courses

Some of these courses have prerequisites.

309 Plato Fall. 4 credits. Prerequisite: at least one previous course in philosophy. Not offered 1986-87
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310 Aristotle Fall. 4 credits.
Aristotle’s main doctrines and the problems they raise for a contemporary philosopher, especially of language and reality; scientific method and the structure of scientific knowledge; matter, form, and substance; essence and accident; philosophy of nature and the understanding of living organisms; mechanism and purpose; time and change; and soul and body.

[311 Modern Rationalism Fall. 4 credits. Not offered 1986–87]

312 Modern Empiricism Fall. 4 credits.
T R 2:30–3:45. S. Shoemaker.
The course will be devoted to David Hume’s writings in theory of knowledge and metaphysics. The main texts will be the first two books of the Treatise of Human Nature and the Enquiry Concerning Human Understanding. Topics will include the nature and origin of ideas, our ideas of space and time, the nature of empirical reasoning, the nature of causality, skepticism concerning the senses, substance, and personal identity.

[314 Topics in Ancient Philosophy 4 credits. Not offered 1986–87]

[315 Special Topics in the History of Philosophy Not offered 1986–87]

316 Kant Fall. 4 credits.
Introduction to Kant’s main doctrines in metaphysics, theory of knowledge, and ethics. Kant’s place in the history of philosophy; how he tries to reconcile and transcend the best insights of rationalism and empiricism. Kant’s new philosophical perspective: can we have knowledge of the world as it really is, or can we only know our way of seeing the world? Topics include the possibility of nonempirical knowledge; the nature of space and time and our knowledge of them; proof of the existence of an objective world (has Kant answered scepticism?), why events must have causes, and how we know they must have them; scientific law, determinism, and the possibility of free will; free will, reason, and the basis of morality.

317 Hegel Spring. 4 credits.
T R 11–12. A. Wood.

[318 Twentieth-Century Philosophy Spring. 4 credits. Not offered 1986–87]

319 Philosophy of Marx Spring. 4 credits.
T R 2:30. R. Miller
An investigation of Marx’s theories of economics, politics, and ideology in modern societies; his materialist framework for explaining social change, and his view of postcapitalist society. Attention will be paid to the philosophy of science implicit in Marx’s arguments, the implications of his writings for issues in moral philosophy, and their relevance to contemporary moral and political controversies concerning war, racism, nationalism, political repression, and social inequality. Readings will be from all periods in Marx’s development, including the early writings, Capital, and the writings on French political history.

331 Formal Logic Spring. 4 credits. Prerequisite: Philosophy 231 or equivalent.
M W F 10:10. H. Hodes.
Review of derivations and other material covered in 231; basic set theory; truth in a model and the semantic definitions of consequence, validity, equivalence, and other logic concepts; the soundness and completeness of a natural-deduction formalization of elementary logic. Further topics will be covered if time permits.

332 Semantics (Philosophy of Language) Fall. 4 credits.
T R 1–2:15. A. Appiah.
An introduction to some central questions in the philosophy of language, which will examine issues about the relations between language and mind, on the one hand, and language and reality on the other. We shall discuss some issues in philosophical logic, but the necessary formal apparatus will be introduced in class.

341 Ethical Theory Spring. 4 credits.
Topic for 1986–87: feminist critiques of ethical theory.

342 Law, Society, and Morality(also Law 666) Fall. 4 credits.
M W F 11:15. D. Lyons.
An examination of theories about the nature of law and its relation to morality, including natural law, legal positivism, and legal realism. Readings from Aquinas, Austin, Holmes, Hart, Dworkin, and others.

361 Metaphysics and Epistemology Fall. 4 credits.
M W F 10:10. R. Stainaker.
Hypothetical or conditional reasoning plays an essential role in both theoretical and practical inquiry. To decide what to do we consider what would happen if we did various things. To explain why something happened we consider whether it would have happened in various alternative possible circumstances. How is this reasoning, about what might have happened but didn’t, to be understood? Why are merely hypothetical possibilities relevant to the justification and explanation of what does happen? We will consider attempts by philosophers to analyze conditional concepts, and also uses of conditional concepts to help clarify other concepts such as causation, probability, rational decision, and inductive evidence. Some background in logic is recommended.

363 Topics in the Philosophy of Religion Spring. 4 credits.
T R 10:10. N. Kretzmann.
A detailed analysis and appraisal of a wide spectrum of current work in the field, arranged systematically by topics, including metaphysical, epistemological, and ethical issues in contemporary philosophy of religion.

[381 Philosophy of Science: Knowledge and Objectivity Fall. 4 credits. Not offered 1986–87]

[382 Philosophy and Psychology Not offered 1986–87]

[383 Philosophy of Choice and Decision 4 credits. Not offered 1986–87]

[387 Philosophy of Mathematics Not offered 1986–87]

[388 Social Theory Not offered 1986–87]

389 Philosophy of Science: Evidence and Explanation Spring. 4 credits.
M W F 1:25. R. Miller.
A study of the major current theories of how hypotheses are tested in both the natural and the social sciences, how events and laws are explained, what causation is, and what scientific reasoning can and cannot establish. The approaches examined will include the covering-law model of explanation, positivist attempts to base confirmation on the deduction of observations, relativist accounts of the limits of scientific reasoning, the conception of explanation as adequate causal description, and the theory of confirmation as fair causal comparison. Depending on backgrounds and interests of those taking the course, there may be discussions of topics specific to the social sciences, for example, value-freedom and the status of empathy as a special source of social knowledge. In addition to major works in the philosophy of science by Hempel, Kuhn, Feyerabend, and others, writings of great scientists such as Darwin and Einstein will be used both as illustrations and as sources of philosophical ideas.

390 Informal Study Fall or spring. To be taken only in exceptional circumstances. Credit to be arranged. Must be arranged by the student with his or her adviser and the faculty member who has agreed to direct the study.

Staff.

Advanced Courses and Seminars

These courses are offered primarily for majors and graduate students.

395 Majors Seminar Fall. 4 credits. Open to junior and senior philosophy majors; others by permission. T 3:45–5:40. G. Fine.
Topic for 1986–87: topics from Plato.

411 Greek Philosophical Texts Variable credit.
Fall. Prerequisite: knowledge of Greek and permission of instructor.
Hours to be arranged. T. Irwin.
Reading of Greek philosophical texts in the original.

412 Medieval Philosophy Spring. 4 credits.
W 3:45. N. Kretzmann.
Aquinas’s metaphysics, drawn from various treatises, especially On Being and Essence, Disputed Questions on Truth, and Commentary on Aristotle’s Metaphysics; aiming at a comprehensive, critical understanding of his position.

413 Plato and Aristotle Spring. 4 credits.
Prerequisites: at least two previous courses in philosophy. Not offered 1986–87.

[414 German Philosophy after Kant Fall. 4 credits.
Prerequisites: at least one previous course in philosophy or at least one course in literature, government, or history dealing with nineteenth-century European thought. Not offered 1986–87.

416 Modern Philosophy Spring. 4 credits.
T 10:10. R. Miller.
This course will be devoted to David Hume’s writings in theory of knowledge and metaphysics. The main texts will be the first two books of the Treatise of Human Nature and the Enquiry Concerning Human Understanding. Topics will include the nature and origin of ideas, our ideas of space and time, the nature of empirical reasoning, the nature of causality, skepticism concerning the senses, substance, and personal identity.

431 Deductive Logic 4 credits. Not offered 1986–87

433 Philosophy of Logic 4 credits. Not offered 1986–87

436 Intensional Logic Spring. 4 credits.
M W F 2:30. R. Stainaker.
Formal semantics for, and philosophical applications of, various modal and intensional logics.

437 Problems in the Philosophy of Language Spring. 4 credits.
T R 1–2:15. H. Hodes.

T R 12:20. N. Sturgeon.]

442 Social and Political Philosophy Fall. 4 credits.
W 3:45. R. Miller.
Topic for 1986–87: liberalism and its critics. Rawls’s A Theory of Justice (1971) has become the center of philosophical debate over modern liberal ideals of equality, liberty, and community. We will examine the main arguments of Rawls’s book, major criticisms and alternatives from the libertarian right (Nozick’s Anarchy, State and Utopia), utilitarianism, and the Marxist left, and metaethical implications of recent responses by Rawls and others of similar outlook.

[443 Topics in Aesthetics 4 credits. Not offered 1986–87]

444 Contemporary Legal Theory (also Law 710) 4 credits. Spring.
Hours to be arranged. D. Lyons.
The problem of justifying judicial decisions in “hard” cases (e.g., when the law is unclear) and proposed
Naturalistic Methods in Philosophy (Society for the Humanities 411)

Ideology in Science and Ethics: a Case Study (Society for the Humanities 412)

The Foundations of Ethics (Society for the Humanities 424)

Appraising an Immature Science: A Case of Cognitive Science (Society for the Humanities 427)

Physics


The Department of Physics offers a full range of university-level work in physics, from general education courses for nonscientists to Ph.D.-level independent research. Major research facilities are operated by two component organizations, the Laboratory of Atomic and Solid State Physics (LASSP) and the Laboratory of Nuclear Studies (LNS). LASSP carries out extensive research efforts in condensed-matter physics and in low-temperature physics. LNS operates a major high-energy particle physics research facility at Wilson Laboratory; the Cornell electron-positron storage ring, called CESR. Theoretical work is carried out in many fields of physics, including astrophysics. There is a full schedule of weekly research-oriented seminars and colloquia. Junior and senior students will find many opportunities for research participation and summer jobs.

Three introductory physics sequences are open to freshmen: 101-102, 112-113-114, and 207-208. In addition, there is a cluster of general-education courses, Physics 201 through 206. Physics 101–102, a self-paced autotutorial course, is designed for students who do not intend to take further physics courses and who do not have preparation in calculus. Physics 112 and 207 both require calculus (Mathematics 191 or 111), and additional mathematics is required for subsequent courses in sequence. Physics 101–102 or 207–208 may be taken as terminal physics courses. The three- (or four-) term sequence 112-113-114 (or 116-217-218) is recommended for physics major prerequisites and is particularly appropriate for teacher preparation. The concentration must include at least 15 credits, with at least 8 credits in courses numbered above 300. Students have chosen to concentrate in such topics as physics, biophysics, chemical physics, astrophysics; geophysics; natural sciences; history and philosophy of science; computational physics; or physics with economics or business. A combined biology-chemistry concentration is recommended for premedical students or those who wish to prepare for work in biophysics. The concentration in natural science is particularly appropriate for teacher preparation.

The concentration in physics is recommended as preparation for professional or graduate work in physics or a closely related discipline. Twelve of the 15 concentration credits must be selected from physics courses numbered above 300 (in addition to those selected for part (2) of the core). Physics 410 must be included within those twelve. The following courses are strongly recommended: Physics 341, 443, Mathematics 421, 422, and 423, and at least one of Physics 444, 454, Applied and Engineering Physics 401, 434, Astronomy 431, 432, and Geological Sciences 388.

A student may be granted honors in physics upon the recommendation of the Physics Advisers Committee of the physics faculty.

Distribution Requirement

The requirement in physical sciences is met by any two of Physics 101–102 or 207–208 or 112–113–214 or 207–208. In either case, it is necessary to complete a concurrent sequence of mathematics courses.

Mathematics 191–192–293–294 are usually recommended, except for students especially interested in continuing the study of mathematics, for whom Mathematics 111–122–221–222 (or equivalent) may be preferred.

Prospective majors are urged to make an early appointment at the physics office for advice in planning their programs. Acceptance into the major is normally granted after completion of a year of physics and mathematics at a satisfactory level; the student should propose a tentative plan for completing his or her graduation requirements as well as those for the major. The plan may change from time to time, but it must be approved by the major adviser. The major requirements have two components—a core and concentration. Core requirements for the major include:

2) An intermediate physics course in each of four areas: (a) mechanics—Physics 318 or 431, (b) electricity and magnetism—Physics 325 or 432, (c) modern physics—Physics 316 or 443, and (d) laboratory physics—Physics 310 (when not taken as substitute for laboratory work in 214 or 218), 330, 360, or 410.

Mathematics courses prerequisite for these physics courses are also necessary. The choice of core is influenced by the intended concentration. For a concentration in physics, Physics 116–217–218 (or 112–213–214), 315, 318, 325, and any 300-level laboratory course is appropriate, while for concentrations outside physics, part (2) of the core might consist of, for example, Physics 315, 360, 431, 432.

The concentration reflects the student's interest in some area related to physics; the array of courses must have internal coherence and be approved by the major adviser. The concentration must include at least 15 credits, with at least 8 credits in courses numbered above 300. Students have chosen to concentrate in such topics as physics, biophysics, chemical physics, astrophysics; geophysics; natural sciences; history and philosophy of science; computational physics; or economics or business. A combined biology-chemistry concentration is recommended for premedical students or those who wish to prepare for work in biophysics. The concentration in natural science is particularly appropriate for teacher preparation.

The concentration in physics is recommended as preparation for professional or graduate work in physics or a closely related discipline. Twelve of the 15 concentration credits must be selected from physics courses numbered above 300 (in addition to those selected for part (2) of the core). Physics 410 must be included within those twelve. The following courses are strongly recommended: Physics 341, 443, Mathematics 421, 422, and 423; and at least one of Physics 444, 454, Applied and Engineering Physics 401, 434, Astronomy 431, 432, or Geological Sciences 388.

Foreign language requirement. Students interested in eventual graduate work in physics are advised to meet this requirement with French, German, or Russian.

Honors. A student may be granted honors in physics upon the recommendation of the Physics Advisers Committee of the physics faculty.
Course Prerequisites

Prerequisites are specified in physics course descriptions to illustrate the materials that students should have mastered. Students who wish to plan programs different from those suggested by the prerequisite ordering are urged to discuss their preparation and the choice of a physics advisor or with the instructor in the course. In many cases an appropriate individual program can be worked out without exact adherence to the stated prerequisites.

Courses

101–102 General Physics

101, fall; 102, spring (101–102 also normally offered in summer.) 4 credits each term. Prerequisites: three years of high school mathematics, including some trigonometry. Prerequisite for Physics 102: Physics 101 or 207. Includes more modern physics and less mathematical analysis than Physics 207–208 but more mathematics than 201–206. (Students planning to major in a physical science will elect Physics 207–208 or 123–213–
214.) A mostly self-paced, mastery-oriented tutotrial format; students work in a learning center at hours of their choice. Requirements on each unit are given until mastery is demonstrated.

One opening lecture 7:30 p.m., R Aug. 28 or M Sept. 1 (fall); M Jan. 26 (spring). H. Helm, B. Richardson. Basic principles are presented, but without calculus. Major topics for 101: kinematics, gravitational and electric forces and fields; momentum, angular momentum, energy, thermal physics, fluid mechanics; sound waves. For 102: electricity and magnetism, optics, relativity, quantum physics, particle structure of matter. Laboratory emphasizes instrumentation, measurement, and interpretation of data. Text: Principles of Physics, by Frank J. Blatt.

112 Physics I: Mechanics and Heat

Fall or spring (normally also offered in summer). 4 credits. Primarily for students of engineering and for prospective physics majors. Major topics: coregistration in Mathematics 192 (or 194 or 12) or substantial previous contact with introductory calculus, combined with coregistration in Mathematics 191 (or 193).


116 Physics I: Mechanics and Heat

Fall or spring. 4 credits. A more analytic version of Physics 112, intended for students who will be comfortable with a deeper, somewhat more abstract approach. (However, Physics 116 is not intended exclusively for prospective physics majors.) Prerequisites: a good secondary school physics course and familiarity with basic calculus. Transfer equivalent courses. For the last five weeks of each semester, permitting those students who find Physics 214 too abstract or analytical to transfer into Physics 217. Proctored tests in the continuation of the mathematics sequence required for 112. (Physics 310 may be taken, with permission of the instructor, in place of the Physics 214 lab, and credit for 214 is reduced to 3 credits.) See Physics 214, 217.

Lecs, M W F 9:05 or 11:15; 2 recs each week; one 3-hour lab alternate weeks. Evening exams: fall, Oct. 2, Nov. 18; spring, Feb. 24, Mar. 19, Apr. 16, Fall, R. Richardson, spring, S. Cassel. Laboratory: behavior of matter in electric fields, magnetic fields, Faraday's law, Maxwell's equations, electromagnetic oscillations and waves, relativity. At the level of Fundamentals of Physics, extended version, by Halliday and Resnick. Laboratory covers electrical measurements, DC and AC circuits, resonance phenomena.

201 Aspects of the Physical World

Fall. 3 credits. Intended for nonscientists; does not serve as a prerequisite to further science courses. Assumes no specific science background, but will use high-school level algebra.

Lecs, T R 2:30–3:45, disc. W 3:35. S. Sadoff. The course is designed to give the student an appreciation of the methodology of physics and of how physicists view the universe in which we live. Some topics to be included are the extent of the physical universe in space and time, motion and forces; the great conservation laws of science; the nature of light; and the ideas of relativity, quantum physics, and the nature of the elementary particles of matter.

203 The Physics of Space Exploration

Spring. 3 credits. Intended for nonscientists; does not serve as a prerequisite for further science courses. Assumes no scientific background but will use high school mathematics. Not offered 1986–87.

Lecs, M W F 2:30, disc. W 3:35. E. Salpeter. The principles of physics (plus simple mathematics) are applied to gain knowledge about planets, stars, galaxies, and the universe.

204 Physics of Musical Sound

Fall. 3 credits. Intended for nonscientists; does not serve as a prerequisite for further science courses. Assumes no scientific background but will use high-school algebra. Offered only for students in the Cornell Abroad program in Hamburg, Germany.

E. Cassel. Many features of the production, propagation, and perception of musical sound will be understood in terms of important concepts in physics. Topics covered will include the mechanism of tone production in musical instruments, the distinction in tone quality among different instruments, scales, intervals and tuning, and some aspects of the mechanism of hearing. At the level of Physics and the Sound of Music, by Rigden.

205 Reasoning about Luck

Fall. 3 credits. Intended for nonscientists; does not serve as a prerequisite for further science courses. Assumes no scientific background but will use high-school algebra.

Lecs, M W F 9:05 or 11:15; 5-1 hour labs to be arranged. V. Ambegaokar.

An attempt to explain how and when natural scientists can cope rationally with chance. The first part of the course deals in a constructive way with the basic ideas of probability theory and explains why it is that in large systems likely events can become overwhelmingly likely. An introduction to mechanics and to heat as probabilistic mechanics follows. In this way, interested students are given a nontrivial understanding of the second law of thermodynamics, that putative bridge between C. P. Snow's two cultures. Another physical theory, quantum mechanics, in which apparently contradictory—though in some seemingly strange way—touched on. Approximately five self-paced laboratory experiments will be included.

207–208 Fundamentals of Physics

207 fall; 208, spring. 4 credits each term. Prerequisites for Physics 207: high school physics plus coregistration in Mathematics 192 or 112, or substantial previous contact with introductory calculus, combined with coregistration in Math 193 or 113. Prerequisites for Physics 208: Physics 207 (or 112 or 101) and at least coregistration in Mathematics 192 or 112. Physics 207–208 is a two-semester introduction to physics intended for students majoring in a physical science, mathematics, or an analytically oriented biological science.

Lecs, M W 9:05 or 11:15; 2 recs each week; one 3-hour lab alternate weeks. Evening exams: fall, Oct. 9, Nov. 13, spring, Mar. 5, Apr. 9. Fall, R. Silsbee, spring, P. Lepage.

Core-plus-branch plan. The first nine weeks of each semester are devoted to core material (lec/disc/lab format): 207, mechanics and waves; 208, electromagnetic fields and circuits. For the last five weeks each term, each student selects one branch topic, and the work on this topic is done on a self-paced, tutored basis. Possible branches: 207, thermodynamics, acoustics and the physics of music, special relativity, gravity, optics, introduction to quantum mechanics, nuclear physics, electronics.

Core at the level of Physics, by H. C. Onanian.

213 Physics II: Electricity and Magnetism

Fall or spring (normally also offered in summer). 4 credits. Primarily for students of engineering and for prospective physics majors. Prerequisites: Physics 112 and coregistration in the continuation of the mathematics sequence required for 112. (Physics 310 may be taken, with permission of the instructor, in place of the Physics 214 lab, and credit for 214 is reduced to 3 credits.)

Lecs, T R 9:05 or 11:15; 2 recs each week; one 3-hour lab alternate weeks. Evening exams: fall, Oct. 2, Oct. 28, Nov. 18, spring, Feb. 24, Mar. 19, Apr. 16. Fall, R. Richardson, spring, S. Cassel. Laboratory: behavior of matter in electric fields, magnetic fields, Faraday's law, Maxwell's equations, electromagnetic oscillations and waves, relativity. At the level of Fundamentals of Physics, extended version, by Halliday and Resnick. Laboratory covers electrical measurements, DC and AC circuits, resonance phenomena.

214 Physics III: Optics, Waves, and Particles

Fall or spring (normally also offered in summer). 3 or 4 credits. Primarily for students of engineering and for prospective physics majors. Prerequisites: Physics 213 and coregistration in the continuation of the mathematics sequence required for 112. (Physics 310 may be taken, with permission of the instructor, in place of the Physics 214 lab, and credit for 214 is reduced to 3 credits.)

Lecs, T R 9:05 or 11:15; 2 recs each week; one 3-hour lab alternate weeks. Evening exams: fall, Oct. 2, Nov. 4; spring, Feb. 24, Apr. 2. Fall, staff; spring, R. Galik. Physics with wave phenomena: properties of light; interference and diffraction effects, optics, wave properties of particles, introduction to quantum physics. At the level of Fundamentals of Physics, extended version, by Halliday and Resnick.

217 Physics II: Electricity and Magnetism

Fall or spring. 4 credits. Intended for students who have done very well in Physics 112 or 116 and in mathematics and who desire a more analytic treatment than that of Physics 213. Prospective physics majors are encouraged to select Physics 217. Prerequisites: approval of student's adviser and permission from the instructor. A placement quiz may be given early in the semester, permitting those students who find Physics 217 too abstract or analytical to transfer into Physics 213, which they can do without difficulty at that time. Very little calculus will be taught in this course, but previous contact, especially with the operations grad, div, and curl, is helpful.

Lecs, T R 5:11–15; 1 rec; one 3-hour lab alternate weeks. Evening exams may be scheduled. Fall, R. Bhutram; spring, staff. At the level of Electricity and Magnetism, by Purcell (Vol. 2. Berkeley Physics Series).

218 Physics III: Optics, Waves, and Particles

Fall or spring. 3 or 4 credits. A special section of Physics 214. Conditions governing enrollment are similar to those of Physics 217. Laboratory: behavior of matter in electric fields, magnetic fields, Faraday's law, Maxwell's equations, electromagnetic oscillations and waves, relativity. At the level of Fundamentals of Physics, extended version, by Halliday and Resnick.
214 or 310. Evening exams may be scheduled. Fall, C. Franck; spring, staff. A more rigorous version of Physics 214.

310 Intermediate Experimental Physics Fall or spring. 3 credits. Prerequisite: Physics 208 or 214. May be taken concurrently with Physics 214 or 218 in place of the lab work offered in Physics 214, with permission of student’s adviser.

Labs, R F 1:25–4:25. Fall, R. Galik; spring, staff. Students select from a variety of experiments. An individual, independent approach is encouraged. Facilities of the Physics 410 lab are available for some experiments.

315 Phenomena of Microphysics Fall or spring. 4 credits. Primarily for students of engineering and prospective majors in physics. Prerequisites: Physics 214 and Mathematics 294.

Fall:lec, M W F 9:05, R 2:30; spring: T R 11:15, T 2:30. Fall, D. Lee; spring, S. Teukolsky. Introduction to the physics of atoms, solids, nuclei, and elementary particles, emphasizing the description of phenomena using the results of elementary quantum and statistical physics. At the level of Quantum Physics of Atoms, Molecules, Solids, Nuclei and Particles, by Eisberg and Resnick.

318 Analytical Mechanics Spring. 4 credits. Prerequisites: Physics 208 or 214 plus one of Mathematics 421, 422, or 423, or permission of instructor. Intended for physics majors concentrating in physics. Similar material is covered in Physics 431 at a less demanding analytical level. (Applied and Engineering Physics 333 is approximately equivalent to Physics 318.)

Lecs, M 11:15–1:15, W F 11:15. P. Stein. Newtonian mechanics of particles and systems of particles, including rigid bodies; oscillating systems; gravitation and planetary motion; moving coordinate systems; Eulerian’s and Lagrangian’s equations; Hamilton’s equations; normal modes and small vibrations. At the level of Classical Dynamics, by Marion.

325 Electricity and Magnetism Fall. 4 credits. Prerequisites: Physics 214 plus coregistration in one of Mathematics 421, 422, or 423, or permission of instructor. Intended for physics majors concentrating in physics. Similar material is covered in Physics 433 at a less demanding analytical level.


326 Electromagnetic Waves and Physical Optics Spring. 4 credits. Prerequisite: Physics 325.

Lecs, T R S 9:05, W 1:25. B. Gittelman. Electrodynamics: applications of Maxwell’s equations, wave equation, radiation, transmission lines, wave guides, interference and diffraction phenomena. At the level of Classical Electromagnetic Radiation, by Marion.

330 Modern Experimental Optics Spring. 4 credits. Enrollment limited to approximately 20 students. Prerequisite: Physics 214 or equivalent. Lec, M 2:30; lab, T R 1:25–4:15 or W F 1:25–4:15. L. Hand. A practical laboratory course in basic and modern optics. Students spend two-thirds of the course experimenting with the physics of basic optical phenomena: interference, diffraction, coherence, polarization, and image formation. The last part of the course involves a choice among experiments on lasers and applications of lasers, light pulses and optical communication, and holography. The course also serves as an introduction to the use of optical equipment and techniques that are employed in current research in the fields of biology, chemistry, physics, and astronomy.

341 Thermodynamics and Statistical Physics Fall. 4 credits. Prerequisites: Physics 214 and Mathematics 294.

Lecs, T R S 9:05, T 2:30. A. Sievers. Statistical physics, developing both thermodynamics and statistical mechanics simultaneously. Concepts of temperature, laws of thermodynamics, entropy, thermodynamic relations, free energy. Applications to phase equilibrium, multicomponent systems, chemical reactions, and thermodynamic cycles. Application of statistical mechanics to physical systems; introduction to treatment of Maxwell-Boltzmann, Bose-Einstein, and Fermi-Dirac statistics with applications. Elementary transport theory. At the level of Fundamentals of Statistical and Thermal Physics, by Reif, or Thermal Physics, by Morse.

360 Electronic Circuits (also Applied and Engineering Physics 363) Fall or spring. 4 credits. Prerequisite: Physics 208 or 214 or permission of instructor. No previous experience with electronic circuits is assumed; however, the course moves through the introductory topics (DC and AC circuits, basic circuit elements) rather quickly. Students wishing a more complete background might consider taking Electrical Engineering 210 before Physics 360. Fall term is usually less crowded.

Lec, M 2:30–4:25; labs, T R or W F 1:25–4:25. Fall, B. Kusse; spring, B. Cooper. An experimental survey of some devices and circuits in two general areas: analog and digital electronics. In analog circuits, the major emphasis is on operational amplifiers and DC circuits. In digital circuits, devices (diodes, bipolar transistors, and field-effect transistors) are covered briefly. In digital circuits, some time is spent on combinational logic devices. This experience is then applied to problems in programming and interfacing a simple microcomputer.

400 Informal Advanced Laboratory Fall or spring. (Coregistration in an advanced course.) Variable credit. Prerequisite: two years of physics and permission of instructor.

Lab, see Physics 410. Experiments of widely varying difficulty in one or more areas, as listed under Physics 410, may be done to fill the student’s special requirements.

410 Advanced Experimental Physics Fall or spring. 4 credits. Limited to seniors except by special permission. Prerequisites: Physics 214 (or 310 or 360) plus 315 and 325, or permission of instructor.

Lec, M 2:30–4:25, labs, T W 1:25–4:25. R. Pohl, D. Hand; staff. Selected topics in experimental concepts and techniques. About seventy different experiments are available in acoustics, optics, spectroscopy, electrical circuits, electronics and ionics, magnetic resonance, X-rays, low temperature, solid state, cosmic rays, nuclear physics. The student performs three to six diverse experiments, depending on difficulty, selected to meet individual needs and interests. Independent work is stressed.

431–432 Introductory Theoretical Physics I and II 431, fall; 432, spring. 4 credits each term. Prerequisites: Physics 431: Physics 207–208 or equivalent and mathematics 294 or equivalent; Physics 432: Physics 431 or equivalent. Primarily for physics majors with concentrations outside physics and for graduate students in a science other than physics (such as chemistry, engineering, biology, geology). Physics 318 and 325 cover similar material at a higher analytical level and are intended for physics majors concentrating in these areas.

Lecs, M W F 10:10 and 1:25. Staff. 431: Mechanics. Includes Newtonian mechanics, Lagrange’s and Hamilton’s equations, central forces, rigid-body motion, and small oscillations. At the level of Mechanics, by Symon. 432: Electricity and magnetism. Includes electrostatics, magnetostatics, boundary value problems, dielectric and magnetic materials, electromagnetic waves, introduction to special relativity. At the level of Introduction to Electrodynamics, by Griffiths.

443 Introductory Quantum Mechanics Fall. 4 credits. Prerequisites: Physics 318 and 325, or 431–432, Physics 315 and Mathematics 421; or permission of instructor.

Lecs, M W F 9:05, M 1:25. Evening exams may be scheduled. S. Teukolsky. Introduction to the concepts and techniques of quantum mechanics, at the level of Quantum Mechanics, by Cohen-Tannoudji, Diu, and Laloe.

444 Nuclear and High-Energy Particle Physics Spring. 4 credits. Prerequisite: Physics 443 or permission of instructor.

Lecs, M W F 9:05. F 1:25. K. Gottfried. Behavior of high-energy particles and radiation; elementary particles; basic processes of nuclear reactions; nuclear forces; cosmic rays; general symmetries and conservation laws. At the level of Concepts of Particle Physics, by Gottfried and Weiskopf.

454 Introductory Solid-State Physics Spring. 4 credits. Prerequisite: Physics 443 or Chemistry 793, or permission of instructor.


481–489 Special Topics Seminar Spring. 2 credits. Limited to senior physics majors and those who receive permission of instructor. S-U grades only.

HOURS TO BE ARRANGED. One selected topic of current interest is studied. Students participate in organization and presentation of material.

490 Independent Study in Physics Fall or spring. 1–3 credits. Ordinarily limited to seniors. Prerequisite: permission of professor who will direct proposed work. Copy of request for independent study form must be filed with physics department course coordinator. Individual project work (reading or laboratory) in any branch of physics.

500 Informal Graduate Laboratory Fall, spring, or summer. Variable credit.

506 Design of Electronic Circuitry Spring. 3 credits. M W 9:05 plus lab hours to be arranged. Staff. Circuit techniques and design in electronic measurement and instrumentation, with emphasis on applications to physics experiments. At the level of The Art of Electronics, by Horowitz and Hill.

510 Advanced Experimental Physics Fall, spring, or summer. 3 credits. Labs, T W 1:25–4:25. R. Pohl, D. Harill, and staff. About seventy different experiments are available in acoustics, optics, spectroscopy, electrical circuits, electronics and ionics, magnetic resonance, X-rays, low temperature, solid state, cosmic rays, nuclear physics. Students perform four to eight experiments selected to meet individual needs. Independent work is stressed.

520 Projects in Experimental Physics Fall, spring, or summer. 1–3 credits. To be supervised by faculty member. Students must advise department course coordinator of faculty member responsible for their project. Prerequisite: Physics 510. Projects of modern topical interest that involve some independent development work by student. Opportunity for more initiative in experimental work than is possible in Physics 510.


Lecs, T R 11:15–12:40. S. Shapiro. The formation of compact objects: neutrino and gravitational radiation from supernova collapse and...
neutron stars. Equilibrium configurations, equations of state, stability criteria, and mass limits. The influence of rotation and magnetic fields. Perturbed phenomena. Mass flow in binary systems; spherical and disk accretion; high-temperature radiation processes. Compact X-ray sources and X-ray bursts. Emphasis will be on the application of fundamental physical principles to compact objects. Topics in diverse areas of physics will be discussed: solid-state physics, nuclear physics, relativity, fluid dynamics, high-energy physics, etc. No astronomy or general relativity prerequisites. Text: *Physics of Black Holes, White Dwarfs, and Neutron Stars* by Shapiro and Teukolsky.

551 Classical Mechanics Fall. 3 credits. Prerequisite: An undergraduate course in classical mechanics at the level of books by K. Symon or J. B. Marion. Lects, TR 10:10-10:30. R. T. Talmage. Lagrangian and Hamiltonian formulation of classical mechanics, with modern applications in nonlinear dynamics. Foundations will be taught at the level of *Mechanics* by Landau and Lifshitz. Selected portions of *Regular and Stochastic Motion*, by Lichtenberg and Lieberman, will also be used. Approximately the latter third of the course will be directed at questions of stability and stochasticity in nonlinear systems, with applications to accelerator physics.

553–554 General Relativity (also Astronomy 509–510) 553, fall; 554, spring. 4 credits. Prerequisite: knowledge of special relativity at the level of *Classical Mechanics*, by Goldstein. Offered alternate years. Fall: lect, TR 2:30–4:00. Spring: lect, TR 10:10–11:35. S. Shapiro. Physics 553 is a systematic introduction to Einstein's theory with emphasis on modern coordinate-free methods of computation. Topics include review of special relativity, modern differential geometry, foundations of relativistic laws of physics in the presence of a gravitational field, experimental tests of gravitation theories. At the level of *Gravitation*, by Misner. Physics 554 is a continuation of 553 that emphasizes applications. Astrophysics and cosmology. Topics include relativistic stars, gravitational collapse and black holes, gravitational waves, cosmology.

561 Classical Electrodynamics Fall. 3 credits. Lect, TR 8:30–9:55. M. E. Fisher. Maxwell's equations, electromagnetic potentials, electrodynamics of continuous media (selected topics), special relativity, radiative theory. At the level of *Classical Electrodynamics*, by Jackson.

562 Statistical Mechanics (also Chemistry 796) Spring. 4 credits. Theoretical. Prerequisite: *Advanced Calculus*. A good knowledge of quantum mechanics (at the level of Merzbacher), classical mechanics (at the level of Marion), and statistical mechanics (at the level of Reif). Lects, TR 9:05–10:05. N. W. Ashcroft. Microstates, ensembles, partition functions, and phase-space averaging. Thermodynamic functions and equations of state. Chemical equilibria. Scattering processes; correlation functions; and fluctuations. Quantum statistical mechanics. Fermi-Dirac and Bose-Einstein distributions; Bose-Einstein condensation. Ideal crystals. Virial expansion, simulation methods, metallic and insulating liquids, phase transitions. Density matrix, response methods, and transport. Lattice gases and spin systems; Ising model and critical exponents, melting, freezing, and the wetting of interfaces. At the level of *Statistical Mechanics*, by Pathria, and *Statistical Mechanics*, by McQuarrie.

572 Quantum Mechanics I Fall or spring. 4 credits. Lects, fall, M W F 9:05, E. Siggia; spring, M W F 11:15. Staff. The formulation of quantum mechanics in terms of states and operators. Symmetries and the theory of angular momentum. Stationary and time-dependent perturbation theory. Fermi's golden rule, and variational methods. The elements of scattering theory. At a level between *Quantum Mechanics*, by Merzbacher, and *Quantum Mechanics*, by Landau and Lifshitz. Familiarity with elementary aspects of the Schroedinger equation is assumed, including its application to simple systems such as the hydrogen atom.

574 Quantum Mechanics II Spring. 4 credits. Required of all Ph.D. majors in theoretical physics. Lects, M W F 11:15. V. Ambegaokar. Discussion of quantum mechanics, as well as applications of quantum mechanics, such as collision theory, theory of spectra of atoms and molecules, theory of solids, emission of radiation, relativistic quantum mechanics. At the level of *Lectures on Quantum Mechanics*, by Gordon Baym.

635 Solid-State Physics I Fall. 3 credits. First semester of a two-semester sequence of solid-state physics for graduate students who have had the equivalent of Physics 572 and 562 and some prior exposure to solid-state physics, such as Physics 454. Lects, TR 11:15–12:40. J. Sethna. Electronic and phonon properties of metals and insulators, including transport processes. Discussions at the level of *Solid State Physics*, by N. W. Ashcroft and N. D. Mermin.

636 Solid-State Physics II Spring. 3 credits. Lects, M W F 10:10. Staff. Concepts developed in Physics 635 are extended and applied in a survey of the following: equilibrium and transport properties of real materials, localized states, magnetism, relaxational processes, and phenomenological superconductivity, and other topics of current interest in condensed-matter physics.


646 High-Energy Particle Physics Spring. 3 credits. Lects, TR 1:25–2:55. S. Stone. Topics of current interest, such as high-energy electron and neutron interactions, electron-positron annihilation, and high-energy hadronic reactions, are surveyed. Lectures and reading material are at the level of *Introduction to High Energy Physics*, by Perkins. Note: Only S-U grades will be given in courses numbered 650 or above.

651 Advanced Quantum Mechanics Fall. 3 credits. S-U grades only. Lects, M W F 10:10. T. Yan. Theoretical quantum mechanics with emphasis on perturbation techniques. Extensive applications to quantum electrodynamics. Introduction to renormalization theory. At a level somewhat above that of Ferrell and Dyson.


653 Statistical Physics Fall. 3 credits. Normally taken by graduate students in their second or later years. Prerequisites: competence in the basic principles of quantum mechanics, statistical mechanics, and quantum electrodynamics. S-U grades only. Lects, M W F 9:05. J. Wilkins. Survey of topics in modern statistical physics, including the theory of simple classical and quantum fluids; the theory of ordered systems such as superfluids and the Ising model; quantum field theory and the Bottman equation; phenomenological Fermi liquid theory and hydrodynamics; theories of inhomogeneous systems; scaling theories and phase transitions. The contents of this course vary with the current interests of the instructor. Text will be a draft copy of a new graduate-level textbook on statistical physics by Hejazi-Jensen and Smith.

654 Theory of Many-Particle Systems Spring. 3 credits. Prerequisites: Physics 562, 574, 635, 636, and 653. S-U grades only. Lects, W F 11:15–12:40. Staff. Equilibrium and transport properties of microscopic systems of many particles studied at zero and finite temperatures. Thermodynamic Green's function techniques introduced and applied to such topics as normal and superconducting Fermi systems, superfluidity, magnetism, insulating crystals.

661 High-Energy Phenomena Fall. 3 credits. Prerequisites: Physics 645, 646, and 651 (652 also desirable). S-U grades only. Lects, M W F 2:30. H. Kawai. Field theoretical techniques used to study the strong and weak interactions of elementary particles are surveyed. Among these topics are path integrals, quantization of nonabelian gauge theories, renormalization group equations, applications of perturbative QCD, lattice field theories, chiral lagrangians, and the Standard Model of electroweak interactions. The relevance of these techniques and theories to experimental physics will be stressed.

665 Topics in Theoretical Astrophysics (also Astronomy 555) Fall. 4 credits. S-U grades only. Lects, M W F 2:30. E. Salpeter. Usually concentrates on the theory of the interstellar medium. At the level of Spitzer's *The Physical Processes in the Interstellar Medium.*


681—689 Special Topics Offerings are announced each term. Typical topics are group theory, analyticity in particle physics, weak interactions, superfluids, stellar evolution, plasma physics, cosmic rays, general relativity, low-temperature physics, X-ray spectroscopy or diffraction, magnetic resonance, phase transitions, and the renormalization group.

690 Independent Study in Physics Fall or spring. Variable credit. Students must advise department course coordinator of faculty member responsible for their project. S-U grades only. Supervised graduate study in some branch of physics, either theoretical or experimental, under the direction of any professional member of the staff.

**Psychology**


Variable credit. Students must advise department course coordinator of faculty member responsible for their project. S-U grades only. Supervised graduate study in some branch of physics, either theoretical or experimental, under the direction of any professional member of the staff.
The major areas of psychology represented in the department are human experimental psychology, biopsychology, and personality and social psychology. These areas are described, and the courses are quite diverse. Biopsychology includes such things as animal learning, neuropsychology, interactions between hormones, other biochemical processes, and behavior. Human experimental psychology includes such courses as cognition, perception, memory, and psycholinguistics. Personality and social psychology is represented by courses and fieldwork in psychopathology as well as courses in social psychology and personality. Participation in one of these areas is recommended, and in addition to the three major areas mentioned above, the department also emphasizes the statistical and logical analysis of psychological data and problems.

The Major

Prerequisites for admission to the major are:

1) any three courses in psychology (students often begin with Psychology 101).
2) no grade below C+ in any psychology course; and
3) acceptance by the Majors and Advising Committee of the Department of Psychology.

Application forms may be obtained at the department office and should be filed two weeks before the pre-course enrollment period.

Requirements for the major are:

1) a total of 40 credits in psychology (including prerequisites), from which students majoring in psychology are expected to choose, in consultation with their advisers, a range of courses that covers the basic processes in psychology (laboratory and/or field experience required), and
demonstration of proficiency in statistics before the beginning of the senior year. (See the section below on the statistics requirement.)

Normally it is expected that all undergraduate psychology majors will take at least one course in each of the following three areas of psychology:

1) Human experimental psychology
2) Biopsychology
3) Social, personality, and abnormal psychology

The following classification of Department of Psychology offerings is intended to help students and their advisers choose courses that will ensure that such breadth is achieved.

2) Biopsychology: Psychology 123, 307, 322, 324, 326, 361, 396, 422, 425, 429, 492. Note: Courses in the biopsychology series other than 123 all have 123 and/or an introductory biology among their prerequisites.
3) Social, personality, and abnormal psychology: Psychology 275, 277, 280, 325, 327, 328, 379, 380, 381, 383, 384, 385, 402, 426, 450, 467, 468, 469, 481, 482, 483, 484, 485, 486, 488, 489.

The major adviser determines to which group, if any, the following courses may be applied:


With the permission of the adviser, courses in other departments may be accepted toward the major requirements.

Fieldwork, independent study, and teaching.
The department requires students to observe the following limits on fieldwork, independent study, and teaching.

1) Undergraduates may not serve as teaching assistants for psychology courses if they are serving as teaching assistants for any other course during the same semester.
2) An undergraduate psychology major cannot apply more than 12 of the credits earned in independent study (including honors work) and fieldwork toward the 40 credits required by the major.

Statistics requirement. Proficiency in statistics can be demonstrated in any one of the several ways listed below.

1) Passing Psychology 350.
2) Passing an approved course or course sequence in statistics in another department. The approved list of courses and sequences may change. It has usually included Education 352–353, Industrial and Labor Relations 210–311, and Sociology 301. An up-to-date list is posted outside of 278 Uris Hall. Requests that a particular course be added to this list may be made to Professor Gilovich.
3) Passing a course or course sequence in statistics at some other college or college-level summer school. The course or sequence must be equivalent to at least 6 semester credits. The description of the course from the college catalog and the title and author of the textbook used must be submitted to Professor Gilovich for approval.
4) Passing an examination. This examination can be given at virtually any time during the academic year if the student gives notice at least one week before. Students who have completed a theoretical statistics course in a department of mathematics or engineering and who wish to demonstrate competence in applied statistics usually find this option the easiest. Students planning this option should discuss it in advance with Professor Gilovich. Sample examination questions are posted outside of 278 Uris Hall.

Concentration in biopsychology. Psychology majors interested in psychology as a biological science can elect to specialize in biopsychology. Students in this concentration must meet all of the general requirements for the major in psychology and must also demonstrate a solid background in introductory biology, the physical sciences, including at least introductory chemistry, and mathematics. Students will design with their advisers an integrated program in biopsychology built around courses on psychological, chemical, anatomical, and ecological determinants of human and nonhuman behavior offered by the Department of Psychology. Additional courses in physiology, anatomy, biochemistry, neurochemistry, neurobiology, and behavioral biology may be designated as part of the psychology major after consultation between the student and his or her biopsychology adviser.

Concentration in personality and social psychology. This option is offered in cooperation with the Department of Sociology. Psychology majors who wish to specialize in social psychology are expected to meet the general requirements set by their department, including statistics. To ensure a solid interdisciplinary grounding, students in the concentration will be permitted to include in the major courses in sociology and related fields. Advisers will assist students in the selection of a coherent set of courses from social organization, cultural anthropology, experimental psychology, social methodology, and several aspects of personality and social psychology. Seniors in the concentration may elect advanced and graduate seminars, with the permission of the instructor.

The undergraduate honors program. The honors program is designed for eligible students who wish to pursue an intensive and independent program of research in psychology. Successful participation in this program serves as evidence of the student's breadth. The two most important skills of an academic psychologist: the capacity to acquire and integrate a substantial body of theoretical and factual material and the ability to engage in creative research activity. All qualified students planning on a graduate education in psychology or other academic fields should consider the honors program seriously. The program offers students the possibility of close consultation with a faculty that they will receive during their time at Cornell.

The core of the honors program is a research project the student carries out in close collaboration with a faculty member in the field of psychology. It is assumed that most students will do so while enrolled in Psychology 470 (Independent Study). A written report of the research is to be given to the chairperson of the honors committee (currently Professor Gilovich) by the last day of classes of the student's senior year. An oral defense of the thesis is then given before a committee of three faculty members during the week before final examinations. Final grades are the average of the final course grades (e.g., law class, magna cum laude, magna cum laude) is indicated on the student's diploma. The T. A. Ryan award, accompanied by a cash prize, is awarded to the student who performs the best honors project in a given year.

A student may formally apply to the honors program at any time during the senior year, provided that she or he is actively engaged in independent research. However, it is expected that most students will do so by the end of the fall term so that they will be able to participate in a series of informal meetings during the spring semester in which the honors students get together to discuss their research projects. Applications should be given to Professor Gilovich and can be made by the student directly or by the student's research adviser.

Distribution Requirement

The distribution requirement in the social sciences is satisfied by any two courses in psychology with the exception of Psychology 123, 307, 322, 324, 326, 350, 361, 396, 422, 425, 429, 451, 471, 472, 473, 475, 476, 477, 479, and 492.

Courses

101 Introduction to Psychology: The Frontiers of Psychological Inquiry Fall or summer. 3 credits. Students may not receive credit for both Psychology 101 and Education 110. Students who would like to take a discussion seminar should also enroll in Psychology 103.

M W F 10:10 J. Maas. Prelims: 7:30 p.m., Sept. 29, Nov. 3. The study of human behavior. Topics include brain functioning and mind control, psychophysiology of sleep and dreaming, psychological testing, perception, learning, cognition, memory, language, motivation, personality, abnormal behavior, psychotherapy, social psychology, and other aspects of applied psychology. Emphasis is on developing skills to critically evaluate claims made about human behavior.

103 Introductory Psychology Seminars Fall. 1 credit. Limited to 400 students. Prerequisites: concurrent enrollment in Psychology 101. Hours to be arranged; 32 different time options. Staff. A weekly seminar, which may be taken in addition to Psychology 101 to provide an in-depth exploration of selected areas in the field of psychology. Involves extensive discussion and a term paper related to the seminar topic. Choice of seminar topics and meeting times will be available at the second lecture of Psychology 101.

123 Introduction to Biopsychology Fall. 3 credits. May not be taken for credit by students who are registered in or have completed one or more courses offered by the Section of Neurobiology and Behavior of the Division of Biological Sciences or two or more biopsychology courses.

M W F 10:10. Staff. A survey of behavior emphasizing evolutionary and physiological approaches, designed to introduce students to the interface between biology and psychology. Both human and nonhuman behavior are included, together with theoretical issues pertaining to the application of biological principles to human behavior.

128 Introduction to Psychology: Personality and Social Behavior Summer. 3 credits.

M. Missendriano. This course covers the following topics: (1) personality—the similarities and differences among people in their behavior and how they develop; Freudian, learning, and humanistic theories of
personality; research in personality; and personality assessment (tests); (2) social behavior—how people behave in interactions with others; discussion of attitudes, persuasion, attraction, aggression, and conformity, incorporating both theory and research; and (3) how personality and social behavior influence each other and cause many interesting social and psychological phenomena.

195 Art and Psychology Summer. 3 credits. D. Foerster.
An examination of aesthetics, painting, architecture, literature, and music from the psychologist's viewpoint. The fields of sensation and perception, cognition, and personality help the student to appreciate the structure of works of art and the techniques used in their production. For example, can beauty be defined and measured? What is creativity and who has it? How can a flat canvas present a realistic illusion of space? And what mechanisms allow a writer to communicate character and plot in a work of fiction? Students are encouraged to pursue their individual interests in an independent research paper; freedom to explore is central to this course. The class visits the museum, views slides, reads selections from literature, and shares observations to complement the lectures.

Introductory courses in cognitive psychology. Each of the following four courses (205, 209, 214, 215) provides an introduction to a major area of study within cognitive psychology. These courses are independent of one another, and no prerequisites are required.

Students may take any one of the courses or any combination of them (including all four). Courses may be taken in any order or simultaneously.

One of four introductory courses in cognitive psychology. Basic concepts and phenomena in the psychology of perception, with emphasis on stimulus variables and sensory mechanisms. All sensory modalities are considered; visual and auditory perception are discussed in detail.

209 Development Spring. 4 credits. T R 12:00-1:45. J. Cutting.
One of four introductory courses in cognitive psychology. A comprehensive introduction to current thinking and research in developmental psychology. The course covers the development of action, perception and knowledge, development of language, morality, and other aspects of human culture, and development of emotional and social relationships.

214 Knowledge and Reasoning Spring or summer. 3 credits. M W F 1:25. K. Krumhansl.
One of four introductory courses in cognitive psychology. A survey of the following topics: visual and auditory memory, imagery, attention, memory for language, reasoning, decision making, and intelligence.

215 Language and Communication Fall or summer. 3 or 4 credits. (4-credit option is given for the completion of a group research project and write-up. Prerequisite: introductory psychology course.

220 Introduction to Social Psychology Spring or summer. 3 or 4 credits, the additional (or fourth) credit is given for an option empirical research project. Limited to 200 students. Prerequisite: introductory psychology course.

277 Psychology of Sex Roles (also Women's Studies 277 and Sociology 277) Spring. 3 or 4 credits, the additional (or fourth) credit is given for an option empirical research project. Limited to 200 students. Prerequisite: introductory psychology course.


288 Psychology of Stereotyping and Prejudice Summer. 3 credits. C. Kerens.
The course addresses questions of why and how people behave in interactions with others; discussion of attitudes, persuasion, attraction, aggression, and conformity, incorporating both theory and research; and (3) how personality and social behavior influence each other and cause many interesting social and psychological phenomena.

system. Material covered will concentrate on psychological research on legal topics (e.g., confession, eyewitness testimony, jury decision-making, homicide, aggression, and the prison system) as well as on psychological logic in the legal system (e.g., assessing insanity and dangerousness and for expert testimony).

275 Introduction to Personality Psychology Fall 3 or 4 credits; the additional (or fourth) credit is given for an option empirical research project. Limited to 200 students. Prerequisite: introductory psychology course.

TR 10:10–11:25, sec to be arranged. D. Bem.
An introduction to research and theory in personality psychology, emphasizing contemporary approaches. Topics include the dynamics, structure, and assessment of personality as well as personality development and change. Biological and sociocultural influences on personality are also considered.


277 Psychology of Sex Roles (also Women's Studies 277 and Sociology 277) Spring. 3 or 4 credits, the additional (or fourth) credit is given for an option empirical research project. Limited to 200 students. Prerequisite: introductory psychology course.

The course addresses the question of why and how adult women and men come to differ in their overall life styles, work and family roles, personality patterns, cognitive abilities, etc. This broad question is examined from five perspectives: (a) the psychoanalytic perspective, (b) the biological perspective, (c) the historical and cultural evolutionary perspective, (d) the child development perspective, and (e) the social-psychological and contemporary perspective. Each of these perspectives is also brought to bear on more specialized phenomena relating to the psychology of sex roles, such as psychological androgyny, women's conflict over achievement motivation, and organization of the world into real-life behavioral settings.

278 Psychology of Stereotyping and Prejudice Summer. 3 credits. C. Kerens.
The course addresses the question of why and how people behave in interactions with others; discussion of attitudes, persuasion, attraction, aggression, and conformity, incorporating both theory and research; and (3) how personality and social behavior influence each other and cause many interesting social and psychological phenomena.

[276 Motivation Theory: Contemporary Approaches and Applications Spring. 4 credits. Prerequisite: introductory psychology course. Not offered 1986–87.]

The course addresses the question of why and how adult women and men come to differ in their overall life styles, work and family roles, personality patterns, cognitive abilities, etc. This broad question is examined from five perspectives: (a) the psychoanalytic perspective, (b) the biological perspective, (c) the historical and cultural evolutionary perspective, (d) the child development perspective, and (e) the social-psychological and contemporary perspective. Each of these perspectives is also brought to bear on more specialized phenomena relating to the psychology of sex roles, such as psychological androgyny, women's conflict over achievement motivation, and organization of the world into real-life behavioral settings.

277 Psychology of Sex Roles (also Women's Studies 277 and Sociology 277) Spring. 3 or 4 credits, the additional (or fourth) credit is given for an option empirical research project. Limited to 200 students. Prerequisite: introductory psychology course.

The course addresses the question of why and how adult women and men come to differ in their overall life styles, work and family roles, personality patterns, cognitive abilities, etc. This broad question is examined from five perspectives: (a) the psychoanalytic perspective, (b) the biological perspective, (c) the historical and cultural evolutionary perspective, (d) the child development perspective, and (e) the social-psychological and contemporary perspective. Each of these perspectives is also brought to bear on more specialized phenomena relating to the psychology of sex roles, such as psychological androgyny, women's conflict over achievement motivation, and organization of the world into real-life behavioral settings.

278 Psychology of Stereotyping and Prejudice Summer. 3 credits. C. Kerens.
The course addresses the question of why and how people behave in interactions with others; discussion of attitudes, persuasion, attraction, aggression, and conformity, incorporating both theory and research; and (3) how personality and social behavior influence each other and cause many interesting social and psychological phenomena.

290 Introduction to Social Psychology Spring or summer. 3 or 4 credits; the additional (or fourth) credit is given for the completion of a group research project and write-up. Prerequisite: introductory psychology course.

An introduction to research and theory in social psychology. Topics include processes of social interaction and group phenomena. The application of social psychological knowledge to current events will also be discussed.

292 Psychology of Stereotyping and Prejudice Summer. 3 credits. C. Kerens.
The course addresses the question of why and how people behave in interactions with others; discussion of attitudes, persuasion, attraction, aggression, and conformity, incorporating both theory and research; and (3) how personality and social behavior influence each other and cause many interesting social and psychological phenomena.

295 What's the Difference? Fall. 1.5 credits. J. Cutting.
A detailed examination of theories and processes in visual perception. Topics will include the perception of color, space, and motion; perceptual constancies; adaptation; pattern perception and photography; television, and film.

297 Chemosensory Perception Fall. 3 or 4 credits; the additional (or fourth) credit is given for an independent laboratory project. Registration for the 4-credit option requires permission of the instructor; students will read, discuss, and discuss difficult original literature in the areas covered. Offered alternate years. Not offered 1986–87.

TR 9:05. B. P. Halpern.
An examination of basic theory, data, and processes for perception of the chemosensory environment. Topics include psychophysical methods for human and nonhuman studies, stimulus control, chemosensory function and development in neonates, role of chemosensory function in food choices, chemosensory communication, effects of pollution on the chemosensory environment, and possible consequences of chemosensory dysfunctions. At the level of the Perception of Odors, by J. Engen, Food Taste Chemistry, edited by J. C. Boudreau; and Clinical Measurement of Taste and Smell, edited by H. L. Melselman and R. S. Rivlin.

300 Perceptual Learning Fall. 3 credits. Prerequisite: Psychology 205, 209, or 305, or permission of instructor. Not offered 1986–87.

309 Development of Perception Fall. 4 credits. Prerequisite: Psychology 205, 209, 214, or 305, or permission of instructor. Not offered 1986–87.

An introduction to theories and research on the origins and development of perceptual knowledge. The course focuses on perception of the world and an arrangement in space and time, perception of the world as a unit that can be encountered through multiple sensory modes, perception of the world as a meaningful place that can be acted upon, and organization of the world into objects and events.

310 The Psychology of Reading Spring. 4 credits. Prerequisites: either Psychology 205, 214, 215, or 305, or permission of instructor. Not offered 1986–87.

The course will introduce the major areas of psychological investigation on cognitive processes used in reading.

313 Perceptual and Cognitive Processes Fall. 4 credits. Prerequisite: Psychology 205 or 214 or permission of instructor.

TR 12:30–1:45. J. Fried.
A critical examination of selected topics in the area of perceptual and higher mental processes. We will read, discuss, and critically analyze original experimental reports and theoretical articles. Topics will include pattern recognition, picture perception, mental imagery, visual memory, the role of context in perception, selective and divided attention, and theories of memory and mental representation.

314 The Social Psychology of Language Spring. 4 credits. Prerequisite: a course in linguistics or psycholinguistics and in social or personality psychology, or permission of instructor.

We are aware that one talks differently to children than to adults, to foreigners than to native speakers, to people we like than to those we detest, to people whose intelligence we respect compared to those we think are idiots. Speech varies by social setting; by the relationships between people; by formality, friendliness,
affection; and by the purposes of the communication: deception, persuasion, propaganda, etc. What are the rules of social language? How do we acquire the abilities to vary language appropriately and to understand the meanings of such variations?

[316] Auditory Perception Spring. 3 or 4 credits; the 4-credit option involves a laboratory project or paper. Prerequisite: Psychology 205, 206, 214, or 215 (other psychology, linguistics, or biology courses could serve as prerequisite with permission of the instructor). Not offered 1986–87.

Lecs, T 2:30–4:25, lab, hours to be arranged.

Staff.

Basic approaches to the perception of auditory information, with special consideration of complex patterns such as speech, music, and environmental sounds.

[322] Hormones and Behavior (also Biological Sciences 322) Spring. 3 or 4 credits; the 4-credit option involves a one-hour section once a week. Students will be expected to participate in discussion and read original papers in the field. Limited to juniors and seniors; open to sophomores only by permission. Prerequisite: one year of introductory biology plus a course in psychology or Biological Sciences 221 or 222. S-U grades optional. Not offered 1986–87.

T 10:10–11:30. E. Atkins Regan, R. Johnston. The relationship between endocrine and neuroendocrine systems and the behavior of animals, including humans. Major emphasis is on sexual, parental, and aggressive behavior.

[324] Biopsychology Laboratory (also Biological Sciences 324) Fall. 4 credits. Limited to 25 juniors and seniors. Prerequisite: Psychology 123 or Biological Sciences 221 or 222, and permission of instructor. S-U grades optional.


Experiments designed to provide research experience in animal behavior (including learning) and its neural and hormonal mechanisms. A variety of techniques, species, and behavior patterns are included.

[325] Introductory Psychopathology Fall or summer. 3 or 4 credits; the 3-credit option entails lectures, readings, and two exams; the 4-credit option requires an additional seminar-recitation meeting and a term paper. Prerequisite: a course in introductory psychology. May be taken concurrently with Psychology 327 (3 credits in 325 and 2 credits in 327) with permission of instructor. Enrollment in Psychology 327 is limited.


A survey of the various forms of psychopathology, child and adult; as they relate to the experiences of human growth and development. Presents a description of the major syndromes, investigations, theories of etiology, and approaches to treatment.

[326] Evolution of Human Behavior Fall. 4 credits. Prerequisite: Psychology 123, an introductory biology course or an introductory anthropology course. Not offered 1986–87.

M W F 9:05. R. Johnston. A broad comparative approach to the behavior of animals and humans, with special emphasis on human evolution and the evolution of human behavior. Topic areas may include courtship and mating systems, aggression and territoriality, communication, language, and cognitive functions. Sociobiological theories of human nature and evolution will be discussed and evaluated.

[327] Fieldwork in Psychopathology and the Helping Relationship Fall. 2 credits. Prerequisite: Psychology 325 or concurrent registration in 325 and permission of instructor. Students do not enrol in advance for this course. Field placement assignments are made in Psychology 325 during the first two weeks of the semester. Students who have already taken Psychology 325 must contact the instructor during the first week of the semester. Enrollment is limited by the fieldwork placements available. Fee, $15.

Hours to be arranged. R. Mack.

An introductory fieldwork course for students currently enrolled in, or who have taken, Psychology 325. Fieldwork placements include the school system, psychiatric institutions, halfway houses, and other mental health-—oriented facilities. In addition to fieldwork, weekly supervisory/meeting sessions are held to discuss fieldwork issues and assigned readings.

[328] Continuing Fieldwork in Psychopathology and the Helping Relationship Fall or spring. 2 credits each term. Prerequisites: Psychology 325, 327, and permission of instructor. S-U grades optional. May not be taken more than twice. Students do not enrol in advanced fieldwork courses in Psychology 327 should inform their teaching assistant before the end of the semester of their desire to take Psychology 328. Students not currently in a field placement who want to take Psychology 328 should contact the instructor during the first week of the semester. Field placement assignments will be made during the first two weeks of the semester. Enrollment is limited by the fieldwork placements available. Fee, $15.

Fieldwork weekly supervisory times to be arranged. R. Mack and staff.

Designed to allow students who have begun fieldwork as part of Psychology 327 to continue their field placements under direction and for academic credit. A limited number of students may be allowed to begin their fieldwork with Psychology 328 but only with permission of the instructor.

[332] Biopsychology of Learning and Memory Spring. 3 credits. Prerequisite(s): one year of biology and either a biopsychology class or Biological Sciences 222.


This course will survey the approaches that have been or are currently being used in order to understand the biological bases for learning and memory. Topics will include invertebrate, "simple system" approaches, imprinting, avian song learning, hippocampal and cerebellar function, and human pathology. Many of the readings will be from primary literature.

[345] Psychological Research and African-Americans (also Africana Studies 345) Spring. 4 credits. Prerequisite: one course in introductory psychology or Africana Studies and Research Center 171.

T R 2:30–3:40. L. Fitzgerald.

In this course we will examine psychological research that has implications for Afro-Americans. The issues to be explored include (1) experimental method, (2) racial attitudes within and between groups, (3) measures of psychological phenomena. The course begins with an overview of research methodology (no prior knowledge in this area is required). Readings and discussion center around the following topics: (1) the organization and representation of social information; (2) assessing the causes of social behavior; and (3) sources of error and bias in human judgment. Course requirements include an examination, an in-class presentation, a midterm paper, and a final project.

[380] Beliefs and Attitudes Spring. 4 credits. Prerequisites: some familiarity with the topic of attitudes from prior courses, or permission of instructor. Not offered 1986–87.

M W F 1:25. Staff.

An intermediate course in social psychology. Attitudes are viewed as emotionally charged beliefs that underlie ideological values, interpersonal perceptions, and beliefs and attitudes toward racial, cultural, and religious groups. The course will analyze the historical roots and current status of three approaches to the systematic analysis of beliefs and attitudes: (1) the reasoned-action theory of Fishbein and Ajzen (how beliefs develop from information, how attitudes develop from beliefs, how these in turn lead to intentions and behavior); (2) the balance theory of Fritz Heider and its several derivatives (how beliefs and attitudes form consistency in their values, relationships with other people, and our other beliefs and attitudes); and (3) the functional theories in psychology, psychoanalysis, and anthropology (how beliefs and attitudes help us live our lives as personalities and members of a society.).
nature, experience, and behavior cross-culturally. Focus on studies of cognition, values, socialization, sociolinguistics, personality, attitudes, stereotype, ideology, sociocultural development, and mental illness. Probabilistically one can learn another culture will also be dealt with.

[385 Theories of Personality (also Sociology 385)]
Fall. 4 credits. Prerequisites: Psychology 101, 214, or 275, or permission of instructor. Not offered 1986–87. T R 1–2:15. W. W. Lambert.
An intermediate analysis of comparative features of the historically and currently important theories of personality within their systematic empirical contribution to modern personality study, to psychology, and to other behavioral sciences.

[387 Health and Disease (also Biology and Society 327 and German Literature 327)]
Fall. 4 credits. Limited to 20 students. Not offered 1986–87. Hours to be arranged. S. L. Gilman and faculty team. Everyone knows what health and disease are. Or do they? This Common Learning course on health and disease will explore the cultural, psychological, philosophical, anthropological, medical, economic, and political dimensions to show how various models of disease function in contexts from business to engineering, from the military to the medical profession. The course will be divided into two segments: the first will examine the general implications of concepts of health and illness; the second will study these general principles as reflected in the definition, treatment, and mythmaking surrounding one specific disease: schizophrenia. The course will draw on specialists from throughout the University.

[396 Introduction to Sensory Systems (also Biological Sciences 396)]
Spring. 3 or 4 credits (4 credit option requires permission of instructor). Prerequisite: an introductory course in biology or biopsychology, plus a second course in neurobiology or behavior or perception or cognition or biopsychology. Students will be expected to have elementary knowledge of perception, neurophysiology, behavior, and chemistry. S–U grades optional for graduate students only. No auditors. Offered alternate years. Not offered 1986–87. M W F 9:00. B. P. Halmi.
The course will be taught using the Socratic method, in which the instructor asks questions of the students. Students read, analyze, and discuss in class difficult original research literature in these areas. Characteristics of sensory systems which are common across living organisms and those sensory properties which represent adaptations of animals to particular habitats will be discussed. General principles and limitations of major methods used to examine sensory systems will be considered. General principles of sensory systems, and auditory, visual, and somesthetic systems are covered. One aspect of each system (e.g., localization of objects in space by sound, color vision, thermoreception) will be selected for special attention.


[401 Current Topics in Psychopathology and Personality]
Summer. 4 credits. Prerequisite: an introductory course in personality or psychopathology. D. Reissman.
Focuses on current research in the areas of psychopathology and personality with special emphasis on the impact of childhood experiences and events and other antecedents of later psychopathology and personality development. Topics may include schizophrenia, psychopathy, depression, the affective disorders, stress, and migraine headaches.

[402 Current Research on Psychopathology]
Fall. 4 credits. Prerequisite: Psychology 325. T R 12:20–2:15, sec to be arranged. K. Keil.
Current research and theory on the nature and etiology of schizophrenia, the affective disorders, and psychopathy. Approaches from various disciplines are considered. Minimal attention to psychotherapy.

[404 Psychopathology and the Family]
This course will explore familial influences on the development of familial behavior. It will examine how psychological, biological, and cultural factors within a family might contribute to such disorders as anorexia nervosa, depression, sexual abuse, psychopathy, and psychosomatic illnesses. Emphasis will be placed on early childhood experiences within the family and how this impacts on the development of later psychopathology. The course will also discuss how the evolution of family structures in more recent times (e.g., the rise in divorce and divorce) influences the individual family therapy approaches and techniques.

[410 Undergraduate Seminar in Psychology]
Fall or spring. 2 credits. Written permission of section instructor required for registration. Nonmajors may be admitted, but psychology majors are given priority. Hours to be arranged. Staff.
Information on specific seminar for each term, including instructor, prerequisites, and time and place, may be obtained from the Department of Psychology office, 211 Urs Hall.

[412 Human Experimental Psychology Laboratory]
Spring. 4 credits. Limited to 15 students. Prerequisite: knowledge of some high-level programming language, at least one course in human experimental psychology, or graduate standing in psychology, and permission of instructor. R 12:30–2:25; lab to be arranged. J. Freyd.
A laboratory course in current methods of experimentation in perception and cognitive psychology that will focus on the use of microcomputers in laboratory research for both stimulus presentation and data collection. Students will hand in written laboratory reports including data analysis and hard copy of computer programs. Projects will be in the areas of visual perception, pattern recognition, reading, memory, language, and concept learning.

[415 Concepts, Categories, and Word Meanings]
Fall. 4 credits. Prerequisites: Psychology 205, 209, 214 or permission of instructor. Not offered 1986–87. T R 12:20–1:45. F. Keil.
Several different psychological theories about concepts, conceptual structure, and word meaning are considered. Important theories of concepts and categorization processes, conceptual change in development and in novice-expert transitions, relations between semantic and conceptual structure, and relations between concepts and intuitive theories of the world.

[416 Psychology of Language]
Spring. 4 credits. Prerequisite: background in psycholinguistics or syntax.
Topic for 1986–87: syntax and semantics. Intensive critical examination of contemporary research into human syntactic and semantic processing in language comprehension and production. Work from psychology, linguistics, and artificial intelligence is studied. Emphasis on healthy adults, but some coverage of children and aphasics. In addition to treating the organization of processing, attention is given to broader issues, such as the relation between grammars and processors, the possible functional bases of linguistic universals, and various versions of the modularity thesis.

[417 The Origins of Thought and Knowledge]
Spring. 4 credits. Prerequisites: Psychology 205, 209, 214 or 215 or permission of instructor.
T R 12:20–1:45. F. Keil.
An in-depth analysis of current theories concerning the growth of thought and knowledge in childhood. Several controversies will be discussed in detail, including: Are mental abilities organized in local domains or modules that have their own patterns of development, or is cognitive development a more general process? Do comparative studies with other species and evolutionary models provide any useful insights into cognitive development in humans? Are there qualitative restructurings of thought and knowledge with development, or is the process more continuous in nature? What restrictions should these developmental considerations place on models of thought and knowledge in adults?

[418 Psychology of Music]
Fall. 3 or 4 credits, depending on whether student elects to do an independent project. Prerequisites: junior or senior standing with major in psychology or music and some background in both, or permission of instructor.
Detailed analysis of topics in the psychology of music, including theories of consonance, perception of tonal– harmonic structure, memory for music, and effects of musical training. Emphasis given to experimental methodologies.

[422 Developmental Biopsychology]
Fall. 4 credits. Prerequisite: a course in introductory biology and a course in biopsychology or neurobiology (such as Psychology 123 or Biological Sciences 221). Not offered 1986–87. Fall offered 1987–88.
M W F 9:05. B. Finlay.
We will discuss the relationship of the development and evolution of the brain to the development of behavior. Topics include normal neuroembryology, how neurons are generated, find targets, and establish connections; the emergence of reflexive and complex behavior; how experience affects the developing brain; evolutionary perspectives on the development of perception, memory, and communication systems; and abnormal development.

[425 Brain and Behavior]
Fall. 3 or 4 credits (4-credit option includes a discussion section and requires an additional paper). Prerequisite: a course in introductory biology and a course in biopsychology or neurobiology (such as Psychology 123 or Biological Sciences 221).
M W F 9:05. B. Finlay.
We will study the relation between structure and function in the central nervous system. Human neuropsychology and neuropsychological theories in animal nervous systems to the understanding of the human nervous system will be stressed. Some topics to be discussed include visual and somatosensory perception, organization of motor activity, emotion and motivation, psychosurgery, and memory and language.

[426 Seminar and Practicum in Psychopathology]
Spring. 4 credits. Limited to 15 students. Prerequisite: Psychology 325; permission of instructor required in all cases. Student should apply to the course during preregistration in fall semester; acceptance will be announced before the end of the fall semester. Not offered 1986–87.
A seminar and practicum course for advanced students who have mastered the fundamental concepts of personality and psychopathology. An opportunity to explore in depth issues in personality and psychopathology, particularly as they relate to issues of development, fantasy, attachment, and sex roles. Includes an experiential component involving self-disclosure, peer counseling, and group process. The goal: an integration of education and personal growth. It is recommended that students take Psychology 328, the fieldwork course, in conjunction with this seminar.

[429 Offeration and Taste: Structure and Function (also Biological Sciences 429)]
Fall. 3 or 4 credits (4-credit option requires term paper or research project). Preference given to junior and senior psychology and biology majors and graduate students.
**Prerequisite:** One 300-level course in biopsychology or equivalent.

**T R 9:05. B. P. Halpern.**

The structural and functional characteristics of olfaction will be examined at the light and electron microscope levels. There will be some coverage of invertebrate forms.

**The emphasis will be on vertebrates, especially air-breathing vertebrates in the case of olfaction, but there will be some coverage of invertebrate forms.**

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**436 Language Development (also Human Developmental Psychology 436 and Linguistics 436)** Spring. 4 credits. Prerequisite: at least one course in developmental psychology, cognitive psychology, cognitive development, or linguistics. S/U grades optional. Offered alternate years.

**T R 10:10–12:05. B. Lust.**

A survey of basic literature in language development. Major theoretical positions in the field are considered in the light of studies in first-language acquisition of phonology, syntax, and semantics from infancy onward. The acquisition of communication systems in nonhuman species such as chimpanzees is addressed. The focus is on the child. The fundamental issue of relationships between language and thought is also discussed.

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**440 Sleep and Dreaming** Spring. 4 credits. Limited to 15 students. Prerequisites: advanced undergraduate or graduate standing and permission of instructor. Not offered 1986–87.

J. Maas.

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**443 The Politics of I.Q.** Fall. 3 credits. Limited to 20 students. Prerequisites: elementary knowledge of theories and measurement of intelligence from prior courses or independent reading, and permission of instructor.

**T R 2:30–4. H. Levin, L. Fitzgerald.**

The research on ethnic and racial differences in the nature of man, ethical concerns, and research methods for approximating the rigor of laboratory experiments in field settings.

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**450 Seminar in the Psychology of Gender (also Women's Studies 450)** Fall. 4 credits. Prerequisite: Psychology 277 and permission of instructor.

**W 2:30–3:30. J. Silver.**

This seminar is designed primarily for advanced students in psychology who have a strong interest in empirical research. Each time the course is offered, a particular research topic will be selected by the instructor for consideration in depth. The topic will be announced at the first meeting of the course. All interested students should attend that meeting.

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**451 Quasi Experimentation** Spring, weeks 1–7. 2 credits. Prerequisite: Psychology 350 or equivalent.

**T R 10:10–12:05. R. Darlington.**

Methods for approximating the rigor of laboratory experiments in field settings.

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**465 Mathematical Psychology** Spring. 4 credits. Prerequisites: one year of college mathematics (finite mathematics or calculus), a course in probability or statistics, and a course in psychology. Not offered 1986–87.

**T R 10:10–11:40. Staff.**

Mathematical approaches to psychological theory are discussed. Possible topics include choice and decision, signal detectability, measurement theory, scaling, stochastic models, and computer simulation.

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**467 Seminar: The Examined Self—A Psychohistorical View** Spring. 4 credits.

**Prerequisites:** 9 credits of psychology including Psychology 325 or equivalent, and permission of instructor before course enrollment. Not offered 1986–87.

**T 12:20–2:15 H. Feinstein.**

Based primarily on American autobiographies dating from the seventeenth century to the twentieth century, this seminar will explore the shifting interface between self and other in light of studies in first-language acquisition of personality. Students should be prepared to write and talk about their own lives as well as the historical figures selected for study.

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**468 American Madness** Spring. 4 credits. Limited to 15 students. Prerequisites: Psychology 325 and permission of instructor.

**T 12:20–2:15 H. Feinstein.**

The seminar will be devoted to an analysis of insanity as a psychological and historical phenomenon. Selected writings by the mentally ill and their definers will be studied.

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**469 Psychotherapy: Its Nature and Influence** Spring or summer. 4 credits. Limited to senior psychology majors. Prerequisites: Psychology 325 or equivalent and permission of instructor before course enrollment.

**W 7:30–10:30 p.m. R. Mack, K. Keil.**

A seminar on the nature of psychotherapy issues related to therapeutic goals, differing views of the nature of man, ethical concerns, and professional problems are also considered. Presentations by therapists of differing orientations and experiential and role-play exercises are an integral part of the seminar experience.

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**470 Undergraduate Research in Psychology** Fall or spring. 1–4 credits. S/U grades optional. Offered permission from the staff member who will supervise the student. Students must be enrolled with the course enrollment enrollment. Students should enrol from the section listed for that staff member. A section list is available from the Department of Psychology.

**HOURS TO BE ARRANGED.**

Practice in planning, conducting, and reporting independent laboratory, field, and/or library research.

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**471 Statistical Methods in Psychology I** Fall. 4 credits. Not offered 1986–87.

**M W F 11:15. Staff.**

Basic probability, descriptive and inferential statistics. Topics include parametric and nonparametric tests of significance, Bayesian inference, correlation, and simple linear regression. The level of the course is that of W. L. Hays, Statistics for Psychologists.

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**472 Multiple Regression** Spring, weeks 1–7. 2 credits. Prerequisite: one solid semester of introductory statistics. Analysis of variance is helpful but not required.

**M W F 10:10. R. Darlington.**

Uses and pitfalls of multiple regression in causal analysis, path analysis, and prediction. Emphasis on analyzing data collected under uncontrolled conditions. Includes collinearity, t-residuals, indicator or dummy variables, hierarchical analysis, specification errors, measurement error. Very little hand computation; uses SAS PROC REG computer program.

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**473 General Linear Model** Spring, weeks 8–14. 2 credits. Prerequisite: Psychology 472 or equivalent.

**M W F 10:10. R. Darlington.**

Use of regression and the general linear model for analyzing experimental and nonexperimental data. Includes random assignment, sets of variables, multica tegorical variables, corrections for multiple tests, nonindependence of relationships, interaction, main and simple effects, nesting, repeated measures, and MANOVA. Uses SAS PROC GLM.

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**475 Multivariate Analysis of Psychological Data** Fall. 2 credits. Prerequisite: Psychology 472 or permission of instructor.

**R 10:10–12:05. R. Darlington.**

Most of the course concerns relative advantages of factor analysis and newer competing techniques. Discovering hidden patterns in correlational data. Uses SAS PROC FACTOR and PROC PRINCOMP. Also includes brief discussions of MANOVA, discriminant analysis, canonical correlation analysis, canonical reduction analysis, and multidimensional scaling.

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**476 Representation of Structure in Data** Fall. 3 credits. Prerequisite: one year of college mathematics (finite mathematics or calculus) and a course in the social sciences. Not offered 1986–87.

**W 2:30–4:30. Staff.**

Representations of preferences, dominance data, psychological distances, and similarities will be discussed. Topics include unidimensional and multidimensional scaling, unfolding, individual differences scaling, hierarchical clustering, and graph-theoretic analysis.

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**478 Psychometric Theory** Fall, weeks 1–10. 3 credits. Prerequisite: Psychology 473 or permission of instructor. Not offered 1986–87.

**T R 10:10–12:05. R. Darlington.**

Statistical methods relevant to the use, construction, and evaluation of psychological tests.

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**479 Multisample Secondary Analysis** Fall, weeks 11–14. 1 credit. Prerequisite: Psychology 350 or equivalent. Not offered 1986–87.

**T R 10:10–12:05. R. Darlington.**

Statistical methods for analyzing and integrating the results of many independent studies on related topics.

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**481 Experimental Social Psychology** Fall. 4 credits. Limited to 30 students. Prerequisite: a course in social psychology or permission of instructor. Not offered 1986–87.

**T R 2:30–3:45. D. Regan.**

Selected topics in social psychology are examined in depth. Readings are usually original research reports. Topics discussed may include social comparison theory, cognitive dissonance, attribution processes, judgmental heuristics and biases, and research methods in social psychology.

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**482 Death and Dying** Spring. 4 credits. Limited to 20 juniors and seniors. Prerequisites: 6 credits in sociology or psychology.

**T R 2:30–4:25. W. Collins.**

Issues of death and dying in modern American society are explored from the perspectives of psychology, sociology, and the health-related professions. Possible inadequacies in current practice are examined and alternatives discussed.

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**483 Socialization and Maturity (also Sociology 483)** Spring. 4 credits. Limited to upperclass and graduate students or those who receive permission of instructor. Prerequisite: some work in psychology, sociology, or anthropology; some background in statistics is assumed. Not offered 1986–87.

**T R 12:20–2:15. W. Lamberts.**

Representative theories of research on socialization at different ages and across the human life span are analyzed, focusing particularly on the underlying processes. The newer topic of personal and sociocultural maturation is also analyzed, and its relation to socialization processes is evaluated in terms of recent evidence.

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**484 The Social Psychology of Close Relationships** Fall. 4 credits. Limited to 15 students. Prerequisites: a course in social psychology and a course in statistics and permission of instructor (by application). Not offered 1986–87.

**R 2:30–5. D. Regan.**

A seminar in which there will be intensive class discussion of topics such as how to analyze close relationships; development and change over time; the roles of emotion, power, love, commitment, exchange, and interdependence, and differences in studying close relationships. Students will individually generate hypotheses about aspects of relationships and develop research strategies for testing them.

T R 2:30–4:25. U. Bronfenbrenner and faculty team. The course analyzes the implications for human development of the profound economic, technological, and social changes that have been taking place in modern societies. Particular emphasis is placed on the effects of such changes on the family, the school, the workplace, and the relations between these domains as they influence the development of intellectual and social competence in adulthood. The topic will be treated from the perspective of several relevant disciplines, including economics (Robert H. Frank), developmental psychology (Stephen Ceci), social anthropology (Robert J. Smith), human biology (Virginia Utermohlen), sociology (Phyllis Moen), and American and European history (Elsbeth Bunch and John Weiss). This is one of a series of Common Learning Courses specially designed to contribute to general education at the upperclass level. Each course focuses on a topic of significance to contemporary society and has been developed by a faculty team from different disciplines, with one instructor taking primary responsibility for the integration and teaching of the course.

486 Interpersonal and Social Stress and Coping (also Sociology 486) Fall. 4 credits. Limited to 25 upperclass students. Prerequisites: background in psychology and introductory statistics, or permission of instructor. Not offered 1986–87.

T 2:30–4:25. W. W. Lambert. A critical review of work in interpersonal, situational, and sociocultural sources of stress and the major psychophysiological concomitants of such stress, resultant coping strategies and aids to coping. Data from laboratory, industry, and other cultures will be analyzed.

488 Development in Context (also Human Development and Family Studies 488) Fall. 4 credits. Prerequisites: upperclass majors in human development and family studies, and one course in statistics, or permission of instructor.

T R 2:30–4:25. U. Bronfenbrenner. The course presents a review and integration of existing knowledge about human development over the life course as a function of interaction between the changing properties of the person and of the place and time in which the person lives. Developmental effects are examined in terms of the interplay of intellectual, social, and emotional processes in an integrated organism.

489 Seminar: Selected Topics in Social Psychology and Personality (also Sociology 489) Spring. 4 credits. Prerequisites: one course in psychology and one course in sociology or permission of instructor. Not offered 1986–87.

Hours to be arranged. Staff. The specific topics of discussion vary, but the general emphasis is on a critical examination of the study of individuals in social contexts.

490 History and Systems of Psychology Fall. 4 credits. Intended for juniors, seniors, and graduate students, majors and nonmajors. Prerequisites: at least three courses in psychology or related fields or permission of instructor. Not offered 1986–87.

M WF 2:30. H. Levin. The course aims to acquaint students with the recent history of psychology and to help them to identify important trends and underlying assumptions in contemporary writings. After a discussion of relevant nineteenth-century developments, a number of the major historical systems will be surveyed: the introspectionist, functionalist, behaviorist, and Gestalt psychologies, psychoanalysis, and cognitive psychology. Emphasis will be on the ideas that have shaped modern psychology.

492 Sensory Function (also Biological Sciences 492) Spring. 4 credits. Prerequisites: A 300-level course in biopsychology, or Biological Sciences 222 or 311, or permission of the instructors. Students are expected to have a knowledge of elementary physics, chemistry, and behavior. S-U grades optional. Offered alternate years.

MWF 10:10, sec, hours to be arranged. H. Cowland, B. P. Halpern. This course covers classical topics in sensory function such as vision, hearing, touch and balance, as well as some more modern topics like sensory coding, location of stimulus sources in space, and the development of sensory systems. Both human and nonhuman systems are discussed. In all cases the chemical, physical, and neurophysiological bases of sensory information are treated, and the processing of this information is followed into the central nervous system. At the level of The Senses, edited by Barlow and Molony, and Sense Organs, edited by M. S. LaVareck and D. J. Cosen.

Advanced Courses and Seminars

Advanced seminars are primarily for graduate students, but with the permission of the instructor they may be taken by qualified undergraduates. The selection of seminar by each term is determined by the needs of the students.

A supplement describing these advanced seminars is available at the beginning of each semester and can be obtained from the department office. The following courses may be offered either term and carry 4 credits unless otherwise indicated.

502 Professional Writing in Psychology
510–511 Perception
512–514 Visual Perception
513 Learning
514 Motivation
517 Language and Thinking
518 Psycholinguistics
519–520 Cognition
521 Psychobiology
522 Topics in Perception and Cognition
523 Physiological Psychology
524 Sex Differences in Brain and Behavior (also Biological Sciences 524) Spring. 2 credits. Limited to 12 seniors and graduate students. Hours to be arranged. T. DeVoogd.

A survey of the newly discovered animal models for sex differences in anatomy, the role of steroids in brain development, whether hormones can modify the structure of the adult brain, and the consequences of such sex differences in anatomy for behavior.

525 Mathematical Psychology
531 History of Psychology
535 Animal Behavior
541 Statistical Methods
543 Psychological Tests
544 Topics in Psychopathology and Personality
545 Methods in Social Psychology
547 Methods of Child Study
551 Distinguished Speakers

561 Human Development and Behavior
580 Experimental Social Psychology (also Sociology 580)
591 Educational Psychology
595 Teaching of Psychology
596 Improvement of College Teaching
600 General Research Seminar No credit.

613 Obesity and the Regulation of Body Weight (also Nutritional Sciences 613) Spring. 3 credits. Limited to 30 students. Prerequisites: one course in psychology and one course in nutrition. Undergraduate students may register with permission of instructor. S-U grades optional. Offered alternate years.


This course is a multidisciplinary discussion of the causes, effects, and treatments of human obesity. Topics include the biopsychology of eating behavior, the genetics of obesity, the role of activity and energy metabolism, psychosocial determinants of obesity, anorexia nervosa, therapy and its effectiveness, and social discrimination.

683 Seminar in Interaction (also Sociology 683)

685 Sex Differences and Sex Roles (also Sociology 685 and Women's Studies 685)

690 Seminar on Nutrition and Behavior (also Nutritional Sciences 690) Spring. 3 credits. Prerequisites: a course in psychology, Nutritional Sciences 361, and permission of instructor. S-U grades optional. Offered alternate years. Not offered 1986–87.


This seminar this year covers several current topics in nutrition and behavior. These topics include early nutritional insult and mental development, malnutrition and behavior, nutrition and learning, food additives and hyperkinesis, megavitamin therapy, inborn metabolic defects and mental illness, nutrition and depression, and hypoglycemia.

700 Research in Biopsychology
710 Research in Human Experimental Psychology
720 Research in Social Psychology and Personality
730 Research in Clinical Neuropsychology Limited to Clinical Neuropsychology Program trainees.

900 Doctoral Thesis Research in Biopsychology
910 Doctoral Thesis Research in Human Experimental Psychology
920 Doctoral Thesis Research in Social Psychology and Personality

Summer Session Courses

The following courses are also frequently offered in the summer session, though not necessarily by the same instructor as during the academic year. Not all of these courses will be offered in a particular summer. Information regarding these courses and additional summer session offerings in psychology is available from the department before the end of the fall semester.

101 Introduction to Psychology: The Frontiers of Psychological Inquiry
124 Introduction to Psychology: The Cognitive Approach
Romance Studies

The Department of Romance Studies (Nelly Furman, chairperson) offers courses in French literature, Italian literature, Portuguese literature, and Spanish literature. In addition, the department's program includes courses in French and Spanish languages and courses in French, Italian, and Hispanic culture. Through its course offerings and opportunities for independent study the department seeks to encourage study of the interactions of the Romance literatures among themselves, with other literatures, and with other fields of inquiry.

See Modern Languages, Literatures, and Linguistics for further information about majors and courses.

Romanian

See Modern Languages, Literatures, and Linguistics.

Russian Literature

P. Carden, C. Emerson, G. Gibian (director of undergraduate studies), 103 Goldwin Smith Hall, 255-8347, S. Senderovich

The Department of Russian Literature offers a variety of courses: some with readings in English translation, others in the original Russian, or both. The connection between Russian history, society, and literature is particularly close, so instruction and discussion in class often include a variety of topics, such as culture and intellectual history, as well as literature. Several courses are interdisciplinary, cosponsored with the departments of History, Economics, Government, Comparative Literature, etc. Students interested in majoring in Russian are strongly urged to take Russian 101 - 102 as soon as possible, preferably in their first year, or by their second at the latest. Russian 203 - 204, offered by the Department of Modern Languages and Linguistics, and Russian 201-202, offered by the Department of Russian Literature, complete basic language instruction and introduce students to literature. A further sequence of literature courses in Russian follows Russian 202.

For further information about courses and majors, see Modern Languages, Literatures, and Linguistics.

Sanskrit

See Modern Languages, Literatures, and Linguistics.

Serbo-Croatian

See Modern Languages, Literatures, and Linguistics.

Sinhala

See Modern Languages, Literatures, and Linguistics.

Sociology


Sociology is concerned with the way individuals are organized into groups, networks, classes, institutions, and communities. Its specialties include analyses of social conflict and accommodation, population trends, organizational and institutional change, influence and power, and the structure of the family, law, religion, medicine, and science. All public policy, local or national, is affected by these sociological issues.

The Department of Sociology offers the opportunity to develop fundamental practical research skills appropriate for the study of social life. Graduates of the department take up careers in university, government, and private settings in and law, business, applied engineering, public policy planning, architecture, education, and other professions seeking men and women who demonstrate a disciplined understanding of society and social issues.

The Department of Sociology has particular strengths in (a) research methods; (b) American institutions and public policy; (c) cross-cultural comparisons; (d) social psychology; and (e) population studies.

Related Courses in Other Departments

Students interested in sociology should also consult the lists of the following departments: Organizational Behavior (College of Industrial and Labor Relations), Human Development and Family Studies (College of Human Ecology), and Rural Sociology (College of Agriculture and Life Sciences). A comprehensive list of all sociology courses offered throughout the University may be found opposite the elevators, third floor, Uris Hall.

The Major

There are three options for sociology majors: honors sociology, general sociology, and social relations.

Requirements for honors: (1) no later than the junior year, the Sociology 301 - 302 - 303 methods and statistics courses and one semester of 491 (students are encouraged to begin taking the methods and statistics courses during their sophomore year); (2) during the senior year, Sociology 495 - 496 and one additional 400-level or higher-level course; (3) 17 additional credits from courses offered by the Department of Sociology or from sociology courses in related departments if approved by the student's adviser. Graduation with honors requires the completion of a thesis with a grade of cum laude or higher and a cumulative average of at least B + in all sociology courses. The major is intended for those who hope to graduate with honors earned through extensive research experience.

Requirements for general sociology: (1) Sociology 101 and either 103 or 105 with a 2.5 minimum grade-point average; (2) no later than the junior year, the Sociology 301 - 302 - 303 methods and statistics courses (students are encouraged to begin taking the methods and statistics courses during their sophomore year); (3) one 400-level course in sociology; and (4) 22 additional credits in sociology, of which 12 may be taken in courses offered by related departments if approved by the student's adviser.

Requirements for social relations: This major is offered jointly by the Departments of Anthropology and Sociology. See page 232 for a description and a list of requirements.

Requirements for all majors: Calculus is not required but is recommended for all majors. More-advanced methods courses may be substituted for Sociology 301, 302, or 303 with the approval of the student's adviser. Other exceptions or substitutions require the approval of both the adviser and the director of undergraduate studies. Students may concentrate their electives in subfields such as population studies, cross-cultural comparisons, social organization and change, or political sociology, but all majors must take one course in at least three different subfields.

Majors in general sociology or in social relations may transfer into honors sociology if they meet the requirements before the beginning of their senior year. Majors in honors sociology must transfer to one of the other options if they are not accepted into Sociology 495 - 496.

Society and economy program. Sociology majors who seek a career in business and management may elect to concentrate in the society and economy program. This program is designed to prepare students for graduate school and professional schools of business and management, providing training in organizational behavior, quantitative data analysis, and economic sociology. For specific advice in a prebusiness and management concentration, see the director of undergraduate studies.

Cornell-in-Washington program. Sociology majors have an opportunity to apply to the Cornell-in-Washington program, in which students take courses and undertake a closely supervised internship during a fall or spring semester. Admission decisions are based on academic records and other competitive criteria. For further information, see p. 10.

Supervised research. Qualified sociology majors are invited to participate with faculty members in conducting research. Such projects are usually initiated in one of two ways: the student may offer to assist the faculty member in an ongoing project, or the student may request that the faculty member supervise the execution of a project conceived by the student. Opportunities are available to work on projects sponsored by the Center for International Studies, the International Population Program, the Social Psychology Laboratory, and the Cornell Institute for Social and Economic Research. Interested students may direct inquiries to any faculty member.

Freshman Seminars

[100.2 Sociology, Biography, and Fiction] Spring. 3 credits. Not offered 1986 - 87.
M W 8:40 - 9:55. S. Caldwell.

Fiction, biography, and sociology as distinctive, complementary ways of examining human behavior. The course uses fictional accounts of behavior drawn from the "hard-boiled" genre, created by writers like Hammet, Cain, and Chandler. Sociological and biographical accounts of crime are compared to the fictional works.]

100.11 Science in the Political Arena] Fall. 3 credits.
M W F 1:25. S. Hilgarter.

Toxic wastes. Genetic engineering. Nuclear war. Health care costs. Energy policy. Animal experimentation. Acid rain. These and many other political issues today center around science and technology. This seminar will explore the role of technical experts in a variety of current policy controversies. Drawing upon a set of case studies of policy disputes, we will examine conflicts within the scientific community, tensions between science and other institutions (e.g., the media and the law), and the uses of science for persuasion and social control.
100.12 Portraits of Status, Power, and Sex (also Society for the Humanities 103) Fall. 3 credits.
Many portraits are not simple records of appearances, but are pictures of social status, power, or sex that aim to flatter, criticize, or titillate. We will learn to recognize portraits like these in painting and drawing, social science, poetry and fiction, and advertising and will examine them in relation to the medium and social environment in which they have been created.

Spanning six centuries, the portraits will range from Chaucer’s Wife of Bath to ads in Playboy and Vogue. Our focus will be on portraits of women and the upper classes in England, France, and America.

100.17 Sociology of Language Spring. 3 credits.
This course examines the diversity and regularities in language use from the smallest units of analysis (individuals in face-to-face interaction) to the largest (national language use and planning). How is language used as a means of social interaction and evaluation? What are the effects of topic, setting, and status on the linguistic choices speakers make? How does language delineate social groups? How is it used as a vehicle for domination and segregation, and how is it used to unify social groups? Biweekly writing assignments and class discussions.

Introductory Courses

The recommended introductory sequence is Sociology 101 and either Sociology 103 or 105, but any of these courses may be taken alone.

101 Introduction to Sociology: Social Organization and Change Fall, spring, or summer. 3 credits.
M W F 11:15, plus disc to be arranged; F classes will meet every second week. Fall: M. Hannan; spring: L. Melander.
An introduction to the concepts and theory of sociology. In the fall semester, particular emphasis will be placed on social organization and stratification, organizational behavior, ethnicity, and political sociology. In the spring semester, the course will be taught by members of the Department of Sociology and will cover similar topics, but with some attention to microsociology.

103 Introduction to Sociology: Microsociology Fall. 3 credits.
An introduction to microsociology, focusing on concepts and the theory of social processes within small groups, including the family. Emphasis is on leadership, conformity, social influence, cooperation and competition, distributive justice, and micro-analyses of interaction.

105 Introduction to Sociology: Population Dynamics Spring. 3 credits.
An introduction to population studies, which includes the determinants and consequences of population change. The primary focus is on the influences of demographic dynamics on society and the economy, with emphasis on marriage, family formation, mortality, crime and deviance, migration, and marketing behavior.

General Education Courses

202 Writing in the Social Sciences (also Writing 202) Fall or spring. 3 credits. Limited to 17 students each section. Prerequisite: one social science course. Sec. 1, M W F 11:15, S. Siskin; sec. 2, T R 12:20–1:35, K. Horthoff.
This course helps students write and read with more confidence and skill, especially in the social sciences. The course examines the ways in which social scientists use language. How and why do their writing vary? How do their theories, objectives, methods, and audiences affect their writing? We will address these questions through discussion and writing about works by social scientists in various fields. Both discussion and writing will aim to strengthen the composition skills that are important in academic work: analysis, comparison, and summarization of topics; description and argument; handling of evidence, references, and quotations; and strategies for revision. Instruction will include frequent individual conferences on finished essays and work in progress. Students will write, and often revise, eight to ten papers—about thirty pages of finished work. Section 1: readings will range from organizational behavior, politics, and policy studies to sociology, anthropology, and psychology. The choice of readings will depend on the students' expertise and interests. As a critical guide to the readings, we will use what social scientists themselves have said about writing in the social sciences. Thus, for example, we might read what sociologist C. Wright Mills has said on the subject and apply his views to his own writing and that of sociologist Erving Goffman, political analyst Conor Cruise O'Brien, and anthropologist Clifford Geertz. Section 2: initial writing assignments and readings will explore some basic variations in social science literature. In a comparative essay, for example, students will distinguish the ways in which two theorists, in sociology and anthropology, define the function of language, the nature of evidence, and the relation between observer and observed. On the basis of these distinctions, students will then write analytical and critical responses to readings in fields, such as anthropology and social psychology, to documentary film; and to student presentations on subjects of their choice (developed in consultation with the instructor).

207 Ideology and Social Concerns Fall. 3 credits (4-credit option available). Not offered 1986–87.
M W F 11:15. R. M. Williams, Jr.
Analysis of social and cultural bases of public policies at national, state, and local levels. Relates demographic, social, and cultural factors to the changing recognition of problems and to shifting models for accomplishing social mobilization, legislation, administration, and adjudication. Public issues examined include affirmative action, civil rights, environmental regulation, military affairs, social security and income maintenance, health, medicine, bioethics, centralization, and local control. Deals with two basic dilemmas of social choice: the problem of the commons and the problem of collective action.

209 Conflict and Cooperation Spring. 3 credits (4-credit option available). Not offered 1986–87.
M W F 11:15. R. M. Williams, Jr.
Are human societies fundamentally cooperative or conflictual? In what ways in which social systems are organized do we play crucial roles in the maintenance and transformation of organizations. A critical survey of classical and current theories of organizations. Explores such issues as the influence of environment and history in shaping organizational structure and function, the university as an organization, cross-cultural comparisons, and other case studies.

221 Sociology of Organizations Summer. 3 credits.
D. Fish.
From corporate organizations, schools, and churches to political-action committees and police agencies, organizations play a dominant role in the structuring of our daily activities. Similarly, as participants in organizations we play crucial roles in the maintenance and transformation of organizations. A critical survey of classical and current theories of organizations. Explores such issues as the influence of environment and history in shaping organizational structure and function, the university as an organization, cross-cultural comparisons, and other case studies.

230 Population Problems Spring. 3 credits (4-credit option available). Not offered 1986–87.
T R 10:10–11:25, plus one hour to be arranged. J. M. Strybos.
The practical and scientific significance of population growth and composition. Fertility, migration, and mortality in relation to social and cultural factors and in relation to questions of population policy. National and international data receive equal emphasis.

240 Personality and Social Change Spring. 3 credits (4-credit option available).
T R 2:30–3:45. B. C. Rosen.
An analysis of social and psychological factors that affect and reflect social change. Topics to be examined will include models of man and society, national character, modern melancholy, feminism, family and sex roles, industrialism, economic development, and psychocultural conflict.

241 Applied Sociology Fall. 3 credits. (4-credit option available). Not offered 1986–87.
M W F 1:25. S. Caldwell.
Established professionals—medicine, management, law, journalism—along with newer ones—polling, behavioral medicine, evaluation research—increasingly utilize sociological findings and methods. The benefit is often mutual, since the discipline of sociology gains from having its theories exposed to practical tests. Drawing frequently on case studies, this course probes the two-way flow of ideas and practices between modern professions and social research. Policy simulation exercises will be carried out on microcomputers.

243 Family Fall. 3 credits (4-credit option available). Not offered 1986–87.
Fall: T R 10:10, plus one hour to be arranged; B. C. Rosen.
A social and historical analysis of the family both in the West and cross-culturally. Specific areas examined include sex roles, socialization, mate selection, sex and sexual controls, internal familial processes, divorce, disorganization, and social change.

245 Inequality in America Spring. 3 credits (4-credit option available).
This course deals with sociological explanations for various forms of social and economic inequality, particularly inequalities associated with class and work. We will describe systems of inequality, analyze various theoretical explanations for those systems, and examine the various structures designed to reduce or eliminate inequality.

248 Politics in Society Spring. 3 credits (4-credit option available). Not offered 1986–87.
M W F 11:15. B. Rubin.
An examination of the relationships between economic, social, and political structures in industrial societies with an emphasis on the role of the United States. Topics include democratic forms of participation in society at large, social movements, the structure of power and its legitimation, the emergence of the welfare state, and the tensions between political and economic structures.

252 Public Opinion Summer. 3 credits (4-credit option available).
A. Bibilowicz.
An explanation of how our images of self and society and specific social processes, are influenced by radio, television, and newly emerging communication and information systems. Introduction to readership and audience planning careers in the humanities, the professions, and the sciences to a sociological perspective on the organization of communication systems and their influence on thought, consciousness, and social change. Development of electronic communication systems from the early days of radio and television to the present, and current viewpoints on the relationship of communication, information, and social processes.

257 Japan: A Sociological Analysis Spring. 4 credits.
Japan is often advanced as a model of a modern industrial society, a model the United States would do well to imitate. This course will examine whether this is a reasonable comparison by analyzing the life of the
urban white-collar Japanese manager. Topics to be discussed include the structure of the firm, family life, the roles of women and men, sexual opportunity and the educational system, problems of retirement and the aging of the population, the treatment of deviance, and the ethical and moral values that underlie the system. Students will learn how to analyze an industrial democracy whose roots are not in the Western European tradition.

[259] Contemporary Chinese Society Fall. 3 credits (4-credit option available). Not offered 1986-87.
TR 10:10-11:30. V. Nee.
This course provides an introduction to Chinese society, its social organization, and institutions. Since 1949 the various development models China has pursued have had differing consequences for society. What effects have they had on power and the position of women, personal relationships, and values? What lessons can we draw from the Chinese experiences in implementing state-directed social change? How do we assess their accomplishments and failures? Recent field research in China will be cited.

[253] Black Americans: Recent Social Changes Fall. 3 credits (4-credit option available). Prerequisite: one course in sociology or Africana studies. Not offered 1986-87.
TR 12:45-2:15. R. Williams.
A critical synthesis of research evidence on the status of Black Americans since World War II. Primary emphasis is placed on five institutional sectors: economic, political, education, and social and cultural integration and separation. The latter sector includes residence and housing, involuntary associations, religious organizations, mass communications, expressive culture and ideologies, social stratification, and informal social networks. Future prospects will be appraised against the background of unprecedented institutional changes in American society.

265 Hispanic Americans Spring. 3 credits (4-credit option available).
TR 2:30-3:45. H. Velez.
Analysis of the present-day Hispanic experience in the United States. An examination of sociohistorical backgrounds as well as the economic, psychological, and political factors that converge to shape and influence a Hispanic group-identity in the United States. Perspectives are developed for understanding the diverse Hispanic migrations, the plight of Hispanics in urban and rural areas, and the unique problems faced by the different Hispanic groups. Groups studied include Dominicans, Chicanos, Cubans, and Puerto Ricans.

277 Psychology of Sex Roles (also Psychology 277 and Women's Studies 277) Spring. 3 credits (fourth credit for optional empirical research paper). Limited to 200 students. Prerequisite: an introductory psychology course.
TR 2:30-4:30. S. Bem.
This course addresses the question of why and how adult women and men come to differ in their overall life styles, work and family roles, personality patterns, cognitive abilities, etc. This broad question is examined from five perspectives: (a) the psychoanalytic perspective, (b) the biological perspective, (c) the historical and cultural evolutionary perspective, (d) the child development perspective, and (e) the social-psychological and contemporaneous perspective. Each of these perspectives is also brought to bear on more specialized phenomena relating to the psychology of sex roles, including psychological androgyny, women's conflict over achievement, the male sex role, equilibrating marriage relationships, gender-liberated child rearing, female sexuality, homosexuality, and transsexualism.

283 Groups and Relationships Fall or summer. 3 credits. Enrollment limited to ten men and ten women in each section.
M or W 7:30-10 p.m. L. Metzler.
The processes and societal functions of small groups (such as teams, committees, and fraternities) and dyadic relationships (such as engaged couples, parent and child, and friends). Involvement in self-study as individuals and as group participants is an integral part of the course. The goal is increased sensitivity to group processes, heightened awareness of the extent to which we have learned (or not) how to manage these phenomena related to larger societal phenomena.

Methods and Statistics Courses

301 Evaluating Statistical Evidence Fall. 4 credits.
M W F 10:10. R. Breiger.
A first course in the use of statistical evidence in the social sciences. Theory is supplemented with numerous applications. Includes an introduction to multivariate causal analysis.

302 Sociological Data Analysis Spring. 4 credits. Prerequisite: Sociology 301 or equivalent.
M W F 10:10. S. Caldwell.
A course providing training in the use of socioeconomic data using introductory statistics. The course is organized around the analysis of data sets reflecting major areas of social science research. Emphasis is placed upon involving students in the use of computers in understanding contemporary society and social issues.

303 (311) Primary Data Collection and Design Spring. 4 credits. Prerequisite: a course in sociology.
Foundations of sociological analysis; issues arising from using humans as data sources; the quality of our primary data; methods of its collection; research designs in wide use and their limitations; pragmatic considerations in doing research on humans, organizations, communities, and nations.

Intermediate Courses

310 Sociology of War and Peace Fall. 4 credits. Prerequisite: a course in sociology or government.
TR 12:45-2:15. R. M. Williams, Jr.
Every human group, community, or society presents many examples of altruism, helping, cooperation, agreement, and social harmony. Each grouping or society also manifests numerous examples of competition, rivalry, disagreement, conflict, and violence. Both conflict and cooperation are permanent and common aspects of the human condition. Collective conflicts, especially wars and revolutions, are frequent and dramatic events. But "peace" and "war" are equally active social processes, not passive happenings. This course describes various commonly accepted but erroneous notions of the causes and consequences of war and peace. It deals with the major theories concerning the sources of war in international and intranational social systems. The last half of the course analyzes the modes, techniques, and outcomes of efforts to restrict, regulate, and resolve international conflicts.

M W F 9:05. B. Rubin.
With the exception of those too rich, too ill, too young, or too old, most people in the United States will spend the majority of their waking lives working. Some will spend that time engaged in jobs they love. Others will be trapped in jobs that deplete the senses, cramp creativity, and provide only a paycheck as a reward. Nevertheless, the centrality of work in most of our lives is taken for granted. We are the ways in which work is organized, rewards are distributed, and (though perhaps less so) workers recruited. The purpose of this course, then, is to explore, and thereby increase our understanding of, the underlying causes and consequences of the organization of work in capitalist America.

341 American Society Spring. 4 credits. Prerequisite: a course in sociology or permission of instructor. Not offered 1986-87.
M W F 9:05. R. Williams, Jr.
Analysis of a total societal system. Critical study of the institutions of kinship, stratification, the economy, the policy, education, and religious systems. Attention is given to values and their interrelations and to deviance and evasion. A survey of the groups and associations making up a pluralistic nation is included.

342 Women and Development in East Asia Spring. 4 credits.
This course examines how women's roles in the family and household are influenced by their control over their reproductive abilities, their participation in the household economy, and their ownership of property. It contrasts women's roles in Japan with those in China and investigates the narrowing of women's opportunities and symbolic position that has accompanied industrialization in Japan.

348 Sociology of Law Fall. 4 credits.
Legal decisions and legal practices viewed within the context of society's institutions and customs. Topics vary from semester to semester, but deal with issues such as civil rights versus society's rights, variations in permissible sexual practices in different cultures, the social organization of police departments and its effects on justice and equity, changing divorce laws in relation to changes in the status of women, the role of psychiatry in the legal process, and judicial attitudes toward rape victims.

355 Social and Political Studies of Science (also City and Regional Planning 442 and Biology and Society 442) Spring. 3 credits.
A view of science, less as an autonomous activity than as a social and political institution. We will discuss such issues as secrecy in science, ethical and value disputes, and the limits to scientific inquiry in the context of the changing relationships between science and the public.

357 Medical Sociology Fall. 4 credits.
Health, illness, death, and the health institutions from a sociological perspective. Factors affecting health care; organization of the medical profession; health and illness behavior; social epidemiology; and key issues in policies affecting the administration and delivery of medical care in the United States.

359 American Families in Historical Perspective (also Human Development and Family Studies 359 and Women's Studies 357) Spring. 3 credits. S-U grades optional. Prerequisites: HDFS 100 or any 200-level social science or history course. Human ecology students must register for HDFS 359.
This course provides an introduction to, and overview of, problems and issues in the historical literature on American families and the family life cycle. Reading and lectures demonstrate the pattern of American family experiences in the past, focusing on ethnicity, sex, and region as important variables. Analysis of the private world of the family deals with changing cultural conceptions of sexuality, sex roles, generational relationships, stages of life, and life events. Students are required to do a major research paper on the history of their family, covering at least two generations and demonstrating their ability to integrate life-course development theory, data drawn from the social sciences, and historical circumstances.

363 Political Sociology Spring. 4 credits. Not offered 1986-87.
TR 10:10-11:30. V. Nee.
Analysis of state and society relations in socialist societies that examines the tensions between planning...
and market, equality and equity, center and locality, bureaucratic domination and individual choice, ideology and dissent. What are the causes of crisis in state-socialist societies and the dynamics and limits of reform movements? The course will develop understanding of the areas of difference and convergence in the patterns of state, market, and household relations in capitalist and socialist societies. Readings will draw primarily on case studies of the Chinese, Cuban, Eastern European, and Soviet experiences.


An examination of the dynamics of race and ethnic relations in the United States and other societies. Alternative explanations—melting-pot assimilation theories, internal colonialism, and Marxist perspectives—between the most culturally evaluated. Topics include a historical comparison of black and white immigrants, the case of Asian-Americans, the causes and consequences of residential segregation, and women as a minority group. Other multilingual societies, such as South Africa and Malaysia, are also studied.

367 Latin American Society Spring. 2–3 credits (third credit earned by writing a research paper). M W 2:30–4:30 D. Gilbert

Latin American revolutions examined in the context of long-term processes of social and economic change. Foci include Mexico, Cuba, and Central America. Topics include development strategies, the relationship between economic growth and class conflict in urban and rural settings, demographic change, and the influence of foreign investors and their governments.

372 Sex Discrimination: Law and Social Policy (also Women's Studies 372 and Government 306) Fall. 3 credits.

M W 12:20 C. Bohmer.

This course will cover the legal and social trends in the area of sex discrimination. It will examine the relationship of sex discrimination and developments in gender-related constitutional law. We will discuss the meaning of sex discrimination in the context of various areas of importance and examine the role of the law in redressing and perpetuating social and legal inequities.

375 Economic Sociology Fall. 4 credits.


Considers a variety of topics at the border of sociology and economics, with special attention to the sociological constraints on economic organization and the impacts of economic organization on social change. Topics covered include marriage market, careers, the structure of firms and industries, world system processes, social movements, and revolution.


M W 2:30–4:30 D. Hayes.

Fine-grain analyses of social behavior, its structure, changes, and determinants. Extensive practice in analysis of filmed and taped interactions. Student research is required throughout the course.

384 Cross-Cultural Psychology (also Psychology 384) Spring. 4 credits. Prerequisite: a course in psychology and one in either sociology or social or cultural anthropology or an instructor. M W 11:15–12:30 W. W. Lambert.

A critical survey of approaches, methods, discoveries, and applications in emerging attempts to study human nature, experience, and behavior cross-culturally. Focus on studies of cognition, values, socialization, sociolinguistics, personality, attitudes, stereotyping, ideology, sociocultural development, and mental illness. Progress once a new culture can be learned another culture will also be dealt with.

385 Theories of Personality (also Psychology 385) Fall. 4 credits. Prerequisite: Psychology 101 or 275, or permission of the instructor. Not offered 1986–87. T R 1–2:15 W. W. Lambert.

An intermediate analysis of comparative features of the historical and current views of personality, with an evaluation of their systematic empirical contribution to modern personality study, to psychology, and to other behavioral sciences.

Advanced Courses

The following courses are intended for advanced undergraduates only. Students should not fail whether their background is sufficient for a particular course should consult the professor in charge.

401 Theories of Society (also Rural Sociology 301) Fall. 4 credits. Not offered 1986–87.

R 11:15–12:30 P. Eberts.

An advanced undergraduate seminar for senior majors in sociology and rural sociology. The course will focus on (1) the central concepts of the sociological tradition; (2) major classical theorists (Max, Weber, Durkheim, de Tocqueville) and contemporary counterparts; (3) application of the classical ideas in contemporary research.

404 Social Networks and Social Structure Spring. 4 credits.


A critical survey of theories and techniques of structural analysis in sociology, centering on the usefulness of social network analysis in providing integration of studies at different levels of generality. Applications in the areas of the sociology of organizations, community studies, social stratification, and dependence relations among nations. Emphasis on the mutual relevance of theories and operational research procedures.

404 Human Fertility in Developing Nations (also Biology and Society 404) Fall. 4 credits. Prerequisite: Sociology 430 or permission of instructor. Not offered 1986–87.

R 2:30–5 C. Hirschman.

A review of the major literature dealing with the social causation of variation in human fertility. Emphasis will be on international comparisons and on the methodology of field research.

414 Population Policy (also Biology and Society 414) Fall. 4 credits. Prerequisite: graduate standing or permission of instructor. R 2:30–5 J. M. Shyock.

The ways in which societies try to affect demographic trends. Special focus is on government policies and programs to reduce fertility.

420 Mathematics for Social Scientists Fall. 2–4 credits.


Hours to be arranged. S. Caldwell.

Examines the distinctive character of that social research which is sponsored and carried out explicitly for the purpose of informing policy. Intended especially for students considering nonacademic careers. Draws frequently from case studies to probe the methodological requirements, substantive flavor, and partisan context of applied research and also to identify the institutional actors involved in its sponsorship, production, and use.

430 Social Demography Spring. 4 credits. Prerequisite: junior class standing or permission of instructor. M W 9:05 C. Hirschman.

A survey of the methods, theories, and problems of contemporary demography. Special attention is directed to the social determinants and consequences of fertility, mortality, and migration. The populations of both developed and developing areas are examined.

431 Techniques of Demographic Analysis Fall. 4 credits.

T 2–5 C. Hirschman.

A description of the nature of demographic data and the specific techniques used in their analysis. Mortality, fertility, migration, and population trends. All methods are covered, as well as applications of demographic techniques to other data types.


R 2:30–5 C. Hirschman.

Survey of population trends, including fertility, mortality, marriage, migration, and urbanization in Southeast Asia. Demographic patterns are studied as determinants and consequences of changes in social, economic, and familial institutions in different societies. General demographic theory and methods will be introduced as necessary to understand current studies of demographic change in Southeast Asia.

442 Family and Population in History Fall. 4 credits.

R 2:30–5 L. Cornell.

This course analyzes fertility and mortality patterns and their effect on household structures and family roles in seventeenth-, eighteenth-, and nineteenth-century societies. It compares Western European patterns with those in Japan. It asks what kinds of questions have been proposed, what sources are available to investigate them, and how their reliability can be evaluated. Topics for discussion may include the prevalence of family limitation, changing ideas of childhood, men's and women's adult roles, the influence of modes of transmission of property on family roles, and the treatment of the elderly.

444 Contemporary Research in Social Stratification Fall. 4 credits. Not offered 1986–87.

T 2:30–5 R. L. Breiger.

Stratification and mobility as paired concepts requiring mutual articulation. The interplay of structure (occupational groups, labor markets, organizational demographics, social classes) and process (tracking, career trajectories, socioeconomic attainment).

468 Women and Achievement Fall. 4 credits. Not offered 1986–87.

T 2:30–4:30 B. C. Rosen.

An analysis of social and psychological factors affecting female achievement. Topics will include women in the labor force, sex differences in children's achievement, the impact of sex roles on the socialization of competence and achievement among women, and the impact of marriage and the family on career choice and occupational achievement.

470 Research Seminar in Social Movements and Collective Action Spring. 4 credits. Limited to 15 students. Primarily for sociology majors and upper-division students.

R 2:30–4:30 S. O. Ozuk.

Analysis of the dynamics of social movements, including such topics as causes of the women's movement, the civil rights movement, anti-apartheid activity, as well as historical social movements in the United States and elsewhere. The emphasis will be on learning contemporary sociological methods and techniques for collecting and analyzing instances of collective behavior and event-histories of social movements. Students will have access to original data sets of collective action and will present their own research during the course of the seminar.

483 Socialization and Maturity (also Psychology 483) Spring. 4 credits. Limited to upperclassmen and graduate students or those who receive permission of
instructor. Prerequisite: some work in psychology, sociology, or anthropology; some background in statistics is assumed. Not offered 1986–87.


Representative theories of research on socialization at different ages are analyzed, focusing particularly on the underlying processes. The new topic of personal and sociocultural maturity is also analyzed and its relation to socialization processes is evaluated in terms of recent evidence.

[486 Interpersonal and Social Stress and Coping (also Psychology 486)] Fall. 4 credits. Limited to 20 upperclass students. Prerequisite: background in psychology or sociology; required of majors, or permission of instructor. Not offered 1986–87.

A critical review of work in interpersonal, intercultural, situational, and sociocultural sources of stress; the major psychophysiological concomitants of such stress; resultant coping strategies and aids to coping. Data from the laboratory, industry, and other cultures will be analyzed.

491 Independent Study Fall or spring. 1–4 credits. For undergraduates who wish to obtain research experience or to do extensive reading on a special topic. Interested students must submit a petition, available at the departmental offices, 314–318 Uris Hall. Permission to enroll for independent study will be granted only to students who present an acceptable prospectus and secure agreement of a faculty member to serve as supervisor for the project throughout the term. Graduate students should enroll in 891–892.

495 Honors Research Fall or spring. 4 credits. Limited to sociology majors in their senior year. Prerequisite: permission of instructor. Hours to be arranged. S. Caldwell and staff.

496 Honors Thesis: Senior Year Fall or spring. 4 credits. Prerequisite: Sociology 495. Hours to be arranged. S. Caldwell and staff.

497 Social Relations Seminar (also Anthropology 497) Spring. 4 credits. Limited to seniors majoring in social relations. Hours to be arranged. Staff.

Graduate Core Courses

These courses are primarily for graduate students in sociology but may be taken by other graduate students with permission of the instructor. Graduate students in sociology will normally take each of the five courses listed below, but in the concurrence of their special committees other arrangements may be made.

501 Basic Problems in Sociology I Fall. 4 credits. R 2:30–5. S. Caldwell.

Analysis of theory shaping current sociological research. Initial statements by Marx, Weber, Durkheim, Simmel, and others will be evaluated as they have been clarified and tested since the nineteenth century. Attention will also be paid to the nature of theory in sociology and to issues of theory construction. Original theoretical statements will be followed by examination of an empirical test of one portion of the theory, followed by analysis of at least one reformulation, extension, or opposing theory.


Analysis of theory shaping current sociological research. A continuation of Sociology 501.

505 Research Methods I: Logic of Social Inference Fall. 4 credits. Prerequisite: a first course in statistics and probability. MWF 9:05–10 (including the weekly lab). S. Caldwell.

The stages and logic of social inquiry, using the formal language of multivariate regression, with emphasis on applications. Threats to inference—and techniques for meeting such threats—are examined within each stage of inquiry: operationalizing concepts; design, specifying, exploring, testing and evaluating models; dissemination and influence of results. Scope includes survey, comparative-historical, and experimental styles. Work load includes weekly lab exercises with data, requiring analysis of substantive articles, and a research proposal. The first course in a three-course methods sequence (505–507).

506 Research Methods in Sociology II Spring. 4 credits. Prerequisites: Sociology 420 or 505 or equivalent.


Matrix modeling of continuous (interval or ratio scale) outcome variables, emphasizing the general linear model. Model assumptions, consequences of violations, and regression diagnostics. Weekly assignments using mainframe SAS or micro Minitab for analysis of on-line data sets.

507 Research Methods in Sociology III Fall. 4 credits. Prerequisite: Sociology 505.


Treatment of models and methods for analyzing qualitative (discrete) outcomes. Attention is given to both static and dynamic models and methods. Topics covered include regression, cross-classifications, regression models for discrete outcomes, and event-history analysis. A major research paper applying methods covered in the course is required.

Graduate Seminars

These seminars are primarily for graduate students but may be taken by qualified advanced undergraduates with permission of the instructor. Seminar topics are to be offered any term is determined in part by the interests of the students. Only likely that any seminar will be offered more frequently than every other year. Lists and descriptions of seminars are available from the department in advance of each semester. The list below indicates seminars that are likely to be offered in 1985–86, but others may be added, and some may be deleted. Students should check with the department before each term.


Political aspects of decision making in technical areas. Drawing from recent risk disputes, we will examine the origins and characteristics of "technical politics," the role of experts in government, and the problem of expertise in a democratic system.

516 The Politics of Technical Decisions II (also City and Regional Planning 542, Management MBA 687, Biology and Society 416, and Government 629) Spring. 4 credits. Prerequisite: The Politics of Technical Decisions I.


Continuation of the Politics of Technical Decisions I. Political aspects of decision making in technical areas. Drawing from recent risk disputes, we will examine the origins and characteristics of "technical politics," the role of experts in government, and the problem of expertise in a democratic system.


Hours to be arranged. V. Nee.

This course will deal with the organization and execution of studies of social life in naturally occurring settings—through participant observation and various forms of interviewing, as well as the analysis of personal and historical documents. After a brief discussion of selected issues in the methodology of social research, attention will center on a critical examination of five published studies—to ascertain in each case just what the investigator was trying to do and the extent to which he or she succeeded. During the semester each student will be expected to develop a detailed study design and to do whatever preliminary data collection is necessary. This may be a doctoral dissertation, an M.A. research project, or some other inquiry on a problem of personal interest.

523 Analysis of Data with Measurement Error Fall. 4 credits. Prerequisite: Sociology 424 or equivalent. Not offered 1986–87.

Hours to be arranged. Staff.


541 Sociological Theory Spring. 4 credits. Prerequisite: graduate standing or permission of instructor. Not offered 1986–87.


Contemporary and classical theories, including Durkheim, Marx, Weber, and Parsons. Systematic review of theory and research, with emphasis on substantive knowledge and testable hypotheses. Subjects included are social processes, social structure, cultural context, and social and cultural change. Attention is given to the nature and size of the social system (small groups, communities, large organizations, societies) and also to both macro- and micro-social processes and properties (integration, authority, conformity, and deviance).

555 Social Structure and Social Change (also Psychology 585) Fall. 4 credits. Not offered 1986–87.


Consideres application of sociological theory and methods to the study of core problems of social structure and social change. Involves intensive analysis of recent monographs and research reports on a variety of topics.

585 Social Structure and Personality (also Psychology 585) Fall. 4 credits. Not offered 1986–87.


An analysis of the ways in which social and psychological factors interact to affect the development of personality, the rates of individual and group behavior, and the functioning of social systems.

591 Special Seminars in Sociology Fall and spring. 2–4 credits. Hours to be arranged. Staff.

These graduate seminars will be offered irregularly. Topics, credit, and instructors will vary from semester to semester. Students should look at the sociology department bulletin board at the beginning of each semester for possible offerings.

601 Southeast Asia Seminar: Malaysia (also Asian Studies 601) Fall. 4 credits. Not offered 1986–87.


Survey of Malaysian society from prehistory to the present, with emphasis on political, economic, and social change of the nineteenth and twentieth centuries. Among the topics to be considered in a historical perspective are the plural society, colonial rule and its legacy, the export economy and immigrant labor, Malay social structure, the "Emergency," postindependence politics and parties, economic planning and the New Economic Policy, and demographic changes. Students will write research papers.


MWF 10:10–12. F. Buttel.

An analysis of classical sociological theories.

606–607 Sociology Colloquium Fall and spring. No credit. Required of all graduate students. Juniors and seniors are encouraged to attend.

M 12:20–1:30. Staff.
Related Courses in Other Departments


Swahili
See Africana Studies and Research Center.

Swedish
See Modern Languages, Literatures, and Linguistics.

Tagalog
See Modern Languages, Literatures, and Linguistics.

Tamil
See Modern Languages, Literatures, and Linguistics.

Telugu
See Modern Languages, Literatures, and Linguistics.

Thai
See Modern Languages, Literatures, and Linguistics.

Theatre Arts

Drama, Dance, Film
Through its courses and production laboratories, the department provides students with a wide range of opportunities in drama, dance, and film. It offers a major in theatre arts with a concentration in drama or film, and a minor in dance. These majors provide students with an education in theater, dance, and film that is in accordance with the general liberal arts ethic of the college, and they also provide some measure of preprofessional training in these arts. The department also provides the Cornell community with opportunities to participate in productions on an extracurricular basis.

Theatre Arts Major
Prerequisites for admission to the major (to be completed by the end of the sophomore year):
1) Theatre Arts 230
2) Either Theatre Arts 250 or 280
3) A grade of C+ or better in the above courses.
4) Consultation with the department's director of undergraduate studies.

Drama Concentration

Requirements for the classes of 1986 and 1987:
1) Theatre Arts 230, 250, and 280
2) Four laboratory courses distributed as follows: one run-crew experience (151), one stage management experience (153), one acting or dance experience (155), one advanced crew or second run-crew in a different area (151, 251, 351, or 451).
3) Four courses in theatre studies, chosen in the following manner: one course from Theatre Arts 325, 326, 327; one course from Theatre Arts 331, 332, 333; one course from Theatre Arts 334, 335, 336; one course from Theatre Arts 431, 432, 433, 434, and 435.
4) Four courses (at least 12 credits) in other departmental courses, chosen in consultation with an adviser.
5) Two courses in related areas outside the department, chosen in consultation with an adviser.
6) Courses in which a student receives a grade below C cannot be used to fulfill the requirements for the major.

Requirements for the class of 1988 and beyond:
1) Theatre Arts 200, 230, 250, and 280.
2) Same as classes of 1986 and 1987.
3) Same as classes of 1986 and 1987.
4) Three courses (at least 9 credits) in other departmental courses, chosen in consultation with the student's faculty adviser.
5) Same as classes of 1986 and 1987.
6) Same as classes of 1986 and 1987.

Film Concentration

Requirements:
1) Theatre Arts 230 or 240, 250 and 280.
2) Theatre Arts 314 with a grade of C+ or better.
3) 16 credits in film that should include: a) two courses chosen from Theatre Arts 375, 376, 378, and 379. b) Theatre Arts 477.
4) 8 credits in other theatre arts courses.
5) 12 additional credits of related work outside the department.
6) An average of C+ or better in all theatre arts courses.

The Dance Program

In addition to courses in composition, history, and movement sciences, courses in dance technique are offered each semester: four levels of modern and three of ballet. Registration takes place in Teagle Hall. Technique classes are intended to develop strength, flexibility, coordination, and the ability to perceive and reproduce phrases of dance movement with rhythmic accuracy; clarity of body design, and fullness of expression. The more advanced classes require the mental, physical, and emotional flexibility to perform more complex phrases in various styles. Tai Chi, a Chinese system of movement for health, self-defense, and meditation, and other dance styles and forms such as jazz, Japanese Noh, and Indian and Javanese dance are offered on a rotating basis. Students may satisfy the physical education requirement by taking any of these courses. Up to four academic credits may be earned (one each semester) for enrollment in intermediate or advanced technical classes. The schedule for technique classes is available in the Dance Office, Helen Newman Hall.

Students may receive credit for performance in student-faculty concerts by enrolling in Theatre Arts 155. Repetory and performance workshops are offered in
which staff choreograph and conduct rehearsals for performance of original dance works. Admission is with permission of the instructor. Hours are arranged through the Dance Office, Helen Newman Hall. One academic credit (S-U grades only) may be earned for such work.

**Dance Major**

The dance program is housed in Helen Newman Hall. To be admitted to the major, students must have completed or show competence in intermediate modern technique by the beginning of the junior year.

**Requirements:**

1. A minimum of one technique class each term chosen from Theatre Arts 304, 306, or 308, one credit each term for four terms.
2. Theatre Arts 210, 211, 312, 314, and 315.
3. 20 additional credits in related fields chosen in consultation with advisors.

**Departmental Honors Program**

Candidates for the degree of Bachelor of Arts with honors in theatre arts must fulfill the requirements of the major and maintain an average of B+ in departmental courses and an average of B in all courses. Any such student may, at the beginning of the second semester of the junior year, form a committee of three faculty members to guide and evaluate the honors work. The work will culminate in an honors thesis or practicum to be presented not later than the last day of classes in the final semester of the senior year and an examination to be held not later than the week after the thesis or practicum has been submitted.

**Theatre Laboratories**

Theatre Cornell, the department's producing organization, annually presents a season of classic and modern dramas, dance concerts, and experimental theatre. This organization functions as the department's principal laboratory for developing actors, directors, dancers, playwrights, designers, technicians, stage managers, and arts administrators.

Production experiences are under the direct supervision of the department's staff and are organized into laboratory courses according to the skill and level of involvement. Students may register for the laboratories most appropriate for their participation.

1. **Design and technology laboratories:** Students may enroll either term in Theatre Arts 151, 153, 251, 351, or 451. These courses progress from elementary crew participation to full design, technical, and stage management assignments.
   - **Course:** Theatre Arts 250 Fundamentals of Theatre Design/Technical Studies. Limited to 20 students.
2. **Rehearsal and performance laboratory:** Students may enroll in Theatre Arts 155, 751, or 752 after being assigned roles through auditions in theatre or dance productions.
   - **Course:** Theatre Arts 211 Beginning Dance Composition and Music. Credits. Concurrent enrollment in a technique class at the appropriate level is required. Students should add this course only after being assigned roles through auditions in theatre or dance productions.

**Film Study Abroad**

The College of Arts and Sciences, through this department and in consort with seventeen other colleges and universities, offers up to a full year's study at the Inter-University Center for Film and Critical Studies in Paris, France. The center's program is theoretical, critical, and historical. It is most useful to students pursuing a major in film studies and serves as an intensive supplement to their Cornell film courses. Fluency in French is required, and Theatre Arts 374, 375, and 376 are prerequisites. Inquiries should be addressed to Professor Fredericksen, Cornell's liaison with the center.

**Scholarship**

The Charles B. Moss Scholarship is administered by the department. The recipient is chosen from among those majors in the department who demonstrate exceptional ability.

**Freshman Seminar Requirement**

The Freshman Seminar requirement may be satisfied by Theatre Arts 108, 130, 140, or 150.

**Courses**

**[108 Writing about Film (also English 108)**

- Fall, spring, or summer. 3 credits. Not offered in Theatre Arts 1986–87.
- TR 12:00–1:15.

This course is meant to serve as an introduction to film analysis, but as a writing seminar that takes cinema as its primary object of attention. Students will view a wide range of popular and art films. No familiarity with film history or analysis is expected.

**[130 American Myth in Drama**

- Fall or spring. 3 credits.

This course examines the images of America presented on the twentieth-century stage. How do Americans view themselves? How are they seen by foreign dramatists? To what ends do dramatists use the American myth?

**[140 From Script to Stage: Writing about the Theatrical Process**

- Fall or spring. 3 credits.
- M W F 10:10 or 12:05–1:20. B. Rose.

In this course students will explore and write about the process through which drama becomes theatre: how the methods of playwright, actor, director, and designer dovetail to create the theatrical piece. Students will be asked to apply the rhetorical strategies of theatre to their own essay writing. Texts will include Theatre Cornell productions.

**[150 Looking at Dance**

- Fall. 3 credits. Not offered 1986–87.

This course will explore various aspects of dance writing, including descriptive prose, essays, and reviews. The work of some twentieth-century critics and philosophers will be read for information and perspective and as models of style. Viewing of photographs, films, videotapes, and live performance will complement the readings.

**[151 Production Laboratory I**

- Fall or spring. 1–2 credits. May be repeated for credit. Orientation meeting in Willard Straight Theatre at 7:30 p.m. on the first Tuesday of classes.

**[152 Production Laboratory II**

- Fall or spring. 1–2 credits. May be repeated for credit. Orientation meeting in Willard Straight Theatre at 7:30 p.m. on the first Tuesday of classes.

**[153 Stage Management Production Laboratory**

- Fall and spring. 1–3 credits. May be repeated for credit. Orientation meeting in Willard Straight Theatre at 7:30 p.m. on the first Tuesday of classes.

**[155 Rehearsal and Performance**

- Fall or spring. 1–2 credits; 1 credit per production experience per term up to 2 credits per term. Students must register for the course in the term in which credit is earned; requests for retroactive credit will not be honored. Limited to students who are assigned roles after tryouts at the department's scheduled auditions or who are assigned assistant director positions after obtaining director's approval. Students should add this course only after they have been assigned roles. S-U grades only.

**200 Introduction to Dance I**

- Fall. 3 credits. Limited to 12 students. Concurrent enrollment in a dance technique class at the appropriate level is required. Registration only through department roster in 302 Helen Newman Hall.

An introduction to American modern dance through history, theory, and practice. Films, videotapes, and some readings are discussed. Some class time is given to experiments in movement improvisation and composition. Concurrent enrollment in a dance technique class at the appropriate level is required.

**201 Dance Improvisation**

- Spring. 3 credits. Limited to 12 students. Registration only through department roster in 302 Helen Newman Hall.

An introduction to American modern dance through history, theory, and practice. Films, videotapes, and some readings are discussed. Some class time is given to experiments in movement improvisation and composition. Concurrent enrollment in a dance technique class at the appropriate level is required.

**211 Beginning Dance Composition and Music Resources**

- Fall or spring. 4 credits. Prerequisite: Theatre Arts 210.

Prerequisites for dance majors only: Music 141. Concurrent enrollment in a technique class at the appropriate level is required. Registration only through department roster in 302 Helen Newman Hall.

**210 Beginning Dance Composition and Music Resources**

- Spring. 4 credits. Prerequisite: Theatre Arts 210.

Prerequisite: level II dance technique and permission of instructor. Prerequisites for dance majors only: Music 141. Concurrent enrollment in a technique class at the appropriate level is required. Registration only through department roster in 302 Helen Newman Hall.

**230 Introduction to Theatre History**

- Fall or spring. 3 credits.

A survey of the history of the theatre from its origins to the present day. Special attention will be paid to the evolution of the theatre as an art form and to the changing social functions of the theatre. Representative plays will be read and discussed in their theatrical context.

**[237 Opera (also Music 274)**

- Fall. 3 credits. Not offered 1986–87.

A team-taught introduction to major repertory works, with discussion of texts and theatrical performance, as well as music. Operas surveyed will span the period from Mozart to modern times, with emphasis on works by Mozart, Verdi, and Wagner. Video recordings will be an integral part of the course. Optional trips to live performances will be scheduled where possible.

**240 Introduction to the Theatre**

- Fall. 3 credits.

A survey of the elements of drama and theatre, intended to develop appreciation and rational enjoyment of the theatre in all its forms. Not a production course.

**250 Fundamentals of Theatre Design/Technology**

- Fall or spring. 4 credits. Prerequisite: Theatre Arts 210.

An introduction to design and technical process in the theatre, with particular attention to the unique collaboration of playwright, director, designer, and...
technician. Lectures, discussions, and extensive project work will relate the visual principles of designing scenery, costumes, and lighting to the production techniques by which designs are realized on the stage. This course is prerequisite to all high-level courses in design and technology for the theatre.

251 Production Laboratory II Fall or spring. 1—3 credits. May be repeated for credit. Prerequisite: Theatre Arts 151 or permission of instructor. Orientation meeting in Williard Straight Theatre at 7:30 p.m. on the first Tuesday of classes. R. Armstrong. S. Fox. Specialized instruction and specific responsibilities in production positions such as light-board operator, wardrobe mistress, and set or properties-crew head, often preceded by work in specific areas of scenery, costumes, and lighting, to develop technical skill required by such positions.

280 Introduction to Acting Fall or spring. 3 credits. Each section limited to 16 students. Registration only through department roster in 110 Lincoln Hall. Secs 2—7 will meet the first day of class in 301 Lincoln Hall. M W 2:30—4:25 (primarily for prospective majors and those interested in extended study of acting), A. Van Dyke; T R 2:30—4:25, D. Case, D. Conner, V. Estremoda, M. Jennings, R. Reinholz. Introduction to the problems and techniques of acting through history, theory, and practice. Appreciation of the actor's function as a creative artist and social interpreter through selected readings, lectures, and play attendance. Examination of the actor's craft through improvisation and exercises in physical, emotional, and intellectual skills.

281 Acting I—Basic Technique Fall or spring. 3 credits. Each section limited to 14 students. Prerequisite: Theatre Arts 280 and audition. Registration only through department roster in 110 Lincoln Hall. M W 10:10—12:05, E. Newman, or T R 2:30—4:25, B. Hetz. Practical exploration of the actor's craft through improvisation and exercises in physical and psychological action; problems in the use of imagination, observation, and research as tools for exploring the script.

282 Introduction to Voice and Speech for Performance Fall. 2 credits. Limited to 12 students. Primarily for department majors. Registration only through department roster in 110 Lincoln Hall. M W 2:30—4:25, E. Newman-Rose. Study and practice in the development of vocal technique with an emphasis on the quality, breathing, alignment of the body, and speech practice of standard American English pronunciation.


287 Summer Acting Workshop Summer. 3 credits. Limited to 16 students a section. Fee for theater admissions, $10. An introduction to the processes of acting. Practice in training techniques, rehearsal procedures, and methodology. Productions of the Hangar Theatre Company attended and used as performance examples, will be directed by guest artists and Hangar Theatre Company members.

300 Independent Study Fall or spring. 1—4 credits; no more than 4 credits each semester. May be repeated for credit. Limited to upperclass students working on scholarly projects. Permission will be granted only to students who present an acceptable prospectus and who have secured the agreement of a faculty member to serve as supervisor for the project throughout the term. Students must submit written proposals to the department office and to the Office of Records and Scheduling along with registration forms.

304 Ballet III (also Physical Education 434) Fall or spring. 1 credit. May be repeated for up to 4 credits. Prerequisite: Physical Education 431 or permission of instructor. M W F 1:25—2:55, P. Saul. Study and practice of traditional training exercises and the classical ballet vocabulary; work is done on strengthening the body and using it as an expressive instrument.

306 Modern Dance III (also Physical Education 436) Fall or spring. 1 credit. May be repeated for up to 4 credits. Prerequisite: Physical Education 432 or permission of instructor. M W F 3:05—4:35, J. Finch. Study and practice of training exercises and movement phrases in a modern dance vocabulary: work is done on strengthening the body and using it as an expressive instrument.

307 Asian Dance and Dance Drama (also Asian Studies 307) Fall or spring. 3 credits. May be repeated for credit. Section 1: Indian Dance. [Section 2: Japanese Not offered 1986—87. Section 3: Indonesian Dance Theatre. Not offered 1986—87. M W F 10:10. R. Gupta. Readings, lectures, and practice sessions. On Fridays there will be lectures, demonstrations, and discussions. Videotapes and films will be shown. The Monday and Wednesday classes will consist of learning basic movement vocabulary and dances. No previous experience in dance is necessary.

308 Modern Dance IV (also Physical Education 438) Fall or spring. 1 credit. May be repeated for up to 4 credits. Prerequisite: Theatre Arts 306 or Physical Education 436 with the permission of instructor. T R 4:45—6:15, S. J. Finch. Continuation of Theatre Arts 306.

310 Advanced Dance Composition Fall or spring. 4 credits. Prerequisite: Theatre Arts 210 or 211 or permission of instructor. Hours to be arranged. Staff. Further problems in composition for groups.

311 Film and Performance Fall. 4 credits. Prerequisite: permission of both instructors. Previous work in either film or dance is expected. This course is designed to encourage interdisciplinary connections among the students of the theatre, dance, and film programs in the Department of Theatre Arts. Each fall, the course will focus on one program (dance, acting, or directing) and how it relates to film and video media. Through hands-on use of the department's 16-mm film and 1/4-inch portable video equipment, students will execute studies in various styles of documentation of the performing arts and go on to explore ways of integrating the two mediums into performance. Primarily geared toward production and performance, the course will include readings, lectures, and films on the history of such collaborative work. Students will be encouraged to experiment together to create original work. An informal showing of the student work will be presented at the end of the semester. Cought by members of the dance and film faculty, this semester's work will emphasize formal concepts shared by the two media: time, motion, and space, and composition, editing, and choreography. Studies will include styles and effects of dance documentation, cine-dance, and original collaborative work.

312 Physical Analysis of Movement Spring. 3 credits. T R 1:25—2:40, J. Morgenroth. This course is an examination of human movement with particular attention to dance movement. Readings in Sweggard's Human Movement Potential. Guest lectures by experts in anatomy and health areas. Practical and laboratory work.

314 History of Dance I Fall. 3 credits. Not offered 1986—87. T R 12:20—1:50. A look at the revolution in modern dance that began with Isadora Duncan in the 1920s. The course examines the roots of postmodern dance in an earlier avant-garde, especially in the work of John Cage and Merce Cunningham; the influence of the Judson generation on the seventies and eighties; and current trends in postmodern dance.

315 History of Dance II Spring. 3 credits. Not offered 1986—87. Hours to be arranged. A survey of the history of theatrical dance from the Renaissance to contemporary times.

316 Dance Criticism Fall. 3 credits. Not offered 1986—87. T 1:25—4:25. The course will combine a practical workshop in dance criticism with the study of the principles and history of the discipline. Class sessions will include discussions of the theory of dance as art; group reviews of student essays; and exercises in movement perception, observation, description, and analysis. Students will be expected to attend dance concerts on a regular basis and to write weekly papers.

317 Dancing Women: Image and Icon of the Moving Body Spring. 3 credits. Not offered 1986—87. T 1:25—4:25. An historical analysis of attitudes toward women and femininity in theatrical dances choreographed by both men and women, primarily in the Western world. We will examine images of strength, delicacy, seductiveness, chastity, agility, intellige

325 Classic and Renaissance Drama (also Comparative Literature 352) Spring. 4 credits. M W F 1:25, A. Caouette. A study of the major traditions in Western drama from the beginnings among the Greeks to the Renaissance in England and Spain. The work will consist of both lectures and discussions, focusing primarily on a close reading of the plays. But we shall also give attention to the physical conditions of production and to social and political contexts. Among the authors to be read will be Aeschylus, Sophocles, Euripides, Aristophanes, Marlowe, Shakespeare, and Lope de Vega.

326 European Drama, 1660 to 1900 (also Comparative Literature 353) Fall. 4 credits. M W F 12:20. A. Wilson. Readings from major dramatists from Corneille to Chekhov, including such authors as Moliere, Congreve, Marivaux, Goldoni, Gozzi, Schiller, Kleist, Gogol, Ostrovski, and Iones.

327 Modern Drama (also Comparative Literature 354) Spring. 4 credits. M W F 11:15, R. Gross.
Readings from major twentieth-century European dramatists from Claudel and Pirandello to Beckett and Muller.

331 The Classical Theatre  Fall. 4 credits. Prerequisite: Theatre Arts 230 or permission of instructor.
M W F 11:15. F. Ash.
An examination of major developments in the theatre—acting, staging, dramaturgy—and the historical background to these developments in Greek and Roman dramatic art and literature will be discussed and considered in their theatrical context.

A intensive study of the cultural conditions, plays, and performance situations that mark the revival of the theatre in Europe in the period between the tenth and early seventeenth centuries. Representative plays will be read and discussed in their theatrical context.

333 English and European Theatre, 1600–1800  Spring. 4 credits. Prerequisite: Theatre Arts 230 or permission of instructor.
M W F 2:30. Staff.
A study of theatrical styles and production modes. Topics include the English Restoration and French neoclassical theatres, the European court theatre, and the rise of standing commercial theatre companies. Representative plays of the period will be read and discussed in their theatrical context.

A study of the development of the English and European theatre from 1600 to the early years of the modern theatre. Topics include romanticism in the theatre, the nineteenth-century commercial theatre, and the work of the independent theatre between 1887 and 1914.

335 The Modern and Contemporary Theatre  Fall. 4 credits. Prerequisite: Theatre Arts 230 or permission of instructor.
The history of theatres and theatrical productions in Europe from the early modern theatre to the present day.

[336] American Drama and Theatre  Fall or summer. 4 credits. Prerequisite: Theatre Arts 230 or permission of instructor. Not offered 1986–87.
A study of the American theatre and representative American plays, with emphasis on drama from O’Neill to the present.

338 Japanese Theatre (also Asian Studies 338) 3 credits. Spring. Not offered 1986–87. A study of traditional forms of Japanese theatre. Topics will include ritual and theatre, Noh and Kyogen, Kabuki, and the puppet theatres, and contemporary theatrical use of traditional forms. Special emphasis will be placed on dramaturgy, acting styles, performance aesthetics, and theories of performer training.

348 Playwriting  Fall. 4 credits. Prerequisite: permission of instructor.
A laboratory for the discussion of student plays. Following exercises in dramatic structure and technique, students will be expected to write two or three one-act plays.

349 Advanced Playwriting  Spring. 4 credits. Prerequisite: Theatre Arts 348.
A continuation of Theatre Arts 348, culminating in the composition of a full-length play.

351 Production Laboratory II  Fall or spring. 1–3 credits. May be repeated for credit. Prerequisite: Theatre Arts 251 or permission of instructor. Orientation meeting in Willard Straight Theatre at 7:30 p.m. on the first Tuesday of classes.
Staff.
Production experience in advanced positions in design and/or technology. These include full responsibility for a smaller production assignment, major responsibilities as an assistant on a major production, or significant responsibilities as major crew head.

354 Stagecraft: Scenery and Lighting  Spring. 3 credits. Prerequisite: Theatre Arts 250 or permission of instructor.
M W 10:10–12:05. Staff.
Lectures, discussion, and projects on theatre architecture and equipment; scenic construction, mechanics, and painting; lighting techniques and practice. Students are encouraged to complement this course with 1 or 2 credits of appropriate production lab.

356 Stagecraft: Costumes  Fall. 3 credits. Prerequisite: Theatre Arts 250 or permission of instructor.
M W 10:10–12:05. S. Perkins.
Lectures, discussion, and projects in costume patterning, cutting, and construction; tailoring techniques; fitting; and makeup. Students are encouraged to complement this course with 1 or 2 credits of appropriate production lab.

362 Lighting Design and Technology  Fall. 4 credits.
An exploration of the role of light as an expressive design medium for the interpretation of plays in the theatre. Will explore the visual nature and dramatic impact of light, the design process and its associated communication techniques, and the influence of professional practices on lighting design.

364 Scene Design and Technology  Spring. 4 credits. Prerequisite: Theatre Arts 250 or permission of instructor.
M W 12:20–2:15. Scene design faculty.
A study of the basic problems of design and technology of scenery for the theatre. Will explore the design process, use of research and imagery, techniques of design communication, and materials and associated tools for the realization of designs on the stage.

366 Costume Design/Technology  Fall. 4 credits. Prerequisite: Theatre Arts 250 or permission of instructor.
An introduction to costume design that concentrates on script and character analysis, period research, the use of the elements of design, developing figure drawing and painting skills, analysis of theatrical style, and the understanding of the theatrical process. Project work includes both the rendering of design projects and actual costume construction.

370 Stage Management  Fall. 1 credit. Prerequisite: Theatre Arts 240 or 250.
T 2:30–4. Staff.
Introduction to the concepts and techniques of stage management as they relate to specific areas of production. Development of communication skills relevant to the role of stage manager and each area of production. Development of the greater understanding of the production process as experienced in the position of stage manager or assistant.


374 Introduction to Film Analysis: Meaning and Value  Summer or fall. 4 credits. TR 10:10–12:05. D. Fredericksen, J. Allen.
Consideration of the ways films generate meaning and of the ways we attribute meaning and value to films. Discussion ranges over commercial narrative, documentary, and personal film types.

375 History and Theory of the Commercial Narrative Film  Fall. 4 credits. Fee for screening expenses, $10 (this fee is paid in class).
Consideration of the broad patterns in the history of the commercial narrative film, viewed as an artistic medium and as a system requiring the massive consumption of artifacts. Emphases include the early articulation of a cinematic language, realism as an artistic style, the nature and functions of popular film, and modernism. Major figures include Griffith, Eisenstein, Murnau, von Stroheim, Dreyer, Chaplin, Renoir, Ford, Hitchcock, Welles, Antonioni, Fellini, Bergman, Bunuel, Resnais, Godard, and Herzog.

[376] History and Theory of Documentary and Experimental Film  Fall. 4 credits. Fee for screening expenses, $10 (this fee is paid in class). Not offered 1986–87, next offered 1987–88.
Documentary figures covered include Vertov, Flaherty, Grierson, Ivens, Lorenz, Riefenstahl, Capra, and Jennings. Within the history of the experimental and personal film, emphases are the avant-gardes of the twenties, the movement toward documentary in the thirties, and American experimental and personal film from the forties to the present.

377 Fundamentals of 16-mm Filmmaking  Fall or spring. 4 credits. Limited to 12 students. Prerequisite: permission of instructor. Fee for maintenance costs, $25 (this fee is paid in class). The average cost to each student for materials and processing is $200–250. M W 2–4:25. M. Rivchin.
A hands-on course in the basics of 16mm filmmaking, requiring no prior experience. Each student will complete a number of short film projects to explore narrative, experimental, documentary, animation, and abstract genres. A longer, final sound film project will be screened publicly.

378 Russian Film of the 1920s and French Film of the 1960s  Spring. 4 credits. Prerequisite: Theatre Arts 376. Fee for screening expenses, $10 (this fee is paid in class).
An intensive treatment of two distinct periods of innovation in film theory and history. Emphasis on the relationship between theory and practice. Major figures include Eisenstein, Pudovkin, Vertov, Dovzhenko, Godard, Taut, Resnais, Robbe-Grillet, Eustachie, Rivette, and Dresson.

379 International Documentary Film from 1945 to the Present  Spring. 4 credits. Prerequisite: Theatre Arts 376. Fee for screening expenses, $10 (this fee is paid in class). Not offered 1986–87, next offered 1987–88.
Emphases on the contemporary documentary film as a sociopolitical force, requiring no prior experience. Each student for materials and processing is $200–250. Staff.
Fall. 4 credits.
Consideration of the ways films generate meaning and of the ways we attribute meaning and value to films. Discussion ranges over commercial narrative, documentary, and personal film types.
[381 Acting III—Styles] Fall. 3 credits. Limited to 10 students. Prerequisites: Theatre Arts 380 and permission. Registration only through department roster in 104 Lincoln Hall. Not offered 1986–87. TR 10:10–12:05. J. Thorp. Practice and application of skills and methods to various styles of dramatic literature; practical exploration of historical and social influences as determinants of style.

385 Skills, Techniques, and Approaches to Performance] Spring. 2 credits. Prerequisites: Theatre Arts 281 or permission of instructor. Hours to be arranged. D. Feldshuh. This course will offer the talents of visiting theatrical artists to Cornell and present to the student an opportunity to learn a variety of performance approaches and techniques. The course will be divided into sections with guest artists teaching such subjects as mask work, clowning, auditioning, and other aspects of performance training. Resident faculty will also participate in their own areas of specialty and interest to create a course that combines the resources and specialties of guest artists and resident faculty. The exact subject matter will change from year to year depending on the guest artists in residence.

398 Fundamentals of Directing I] Fall or spring. 3 credits. Limited to 12 students. Fall: MW 2:30–4:30; spring: MW 2:30–4:30. D. Feldshuh. Directs practical exercises that teach the student how to bring a written text to theatrical life. The student will learn how to communicate with actors and apply directorial insights to written texts. Each student will direct a number of exercises as well as a brief original short scene.

410 Individual Problems in Composition Fall or spring. 3 credits. Prerequisite: Theatre Arts 310 or permission of instructor. Hours to be arranged. Staff. Individual problems in dance composition.

[418 Seminar in History of Dance] Spring. 3 credits. Prerequisite: Theatre Arts 315 or permission of instructor. Not offered 1986–87]

431 Theory of the Theatre and Drama Fall. 4 credits. Prerequisites: some theatre history and dramatic literature work at the 300 level or permission of instructor. Not offered 1986–87. MWF 11:15–12:05. M. Hays. A study of various theories of dramatic form and theatrical presentation from Aristotle and Horace to Goethe and Schiller.

[432 Theory of the Theatre and Drama II] Fall. 4 credits. Prerequisite: some theatre history and dramatic literature work at the 300 level or permission of instructor. Not offered 1986–87]

433 Dramaturgy: Play and Period] Spring. 4 credits. Prerequisites: some theatre history and dramatic literature work at the 300 level or permission of instructor. M. Hays.

434 Theatre and Society (also Society for the Humanities 381 and 382, and History 381 and 382] Fall or spring. 4 credits. Prerequisite: permission of instructor or some theatre history or dramatic literature work at the 300 level. R 2:30–4:30. F. Ahl, D. Wyatt, Gilbert and Sullivan: text and context. An examination of Gilbert and Sullivan’s major works in the context of Victorian theater and society. Special attention will also be given to their skillful integration of words, music, and action and to the performers for whom many of their roles were designed.

435 Special Topics] Spring. 4 credits. Prerequisite: some theatre history or dramatic literature work at the 300 level or permission of instructor.


451 Production Laboratory IV Fall or spring. 1–4 credits. Must be repeated for credit. Prerequisite: Theatre Arts 351 or permission of instructor. Orientation meeting in Willard Straight Theatre at 7:30 p.m. on the first Tuesday of classes. R. Dreessler, H. Cole. Production experience involving full design and/or technical responsibility for a play or dance. Work will be supervised in a tutorial manner by appropriate faculty.

[462 Seminar in Lighting Design] Spring. 4 credits. Prerequisite: Theatre Arts 362 and permission of instructor. Not offered 1986–87. MW 12:20–2:15. Selected topics in the history of lighting design style, the aesthetics of light and their role in play analysis, and the contribution of light to the establishment and manipulation of dramatic space.

[464 Seminar in Scene Design] Fall. 4 credits. May be repeated for credit. Prerequisite: Theatre Arts 364 and permission of instructor. Not offered 1986–87. MW 12:20–2:15. H. Cole. This course builds on the Costume Design I topics and further explores the design process. Students will direct a number of exercises as well as a brief original short scene.

466 Seminar in Costume Design Spring. 4 credits. May be repeated for credit. Prerequisite: Theatre Arts 366 and permission of instructor. MW 12:20–2:15. H. Cole, S. Perkins. Students work in small crews to produce a short dramatic film and/or a short documentary film, using synchronous sound film and editing equipment. Equipment is provided, but students must pay for film and processing (average cost, $125).

475 Seminar in the Cinema I Spring. 4 credits. Prerequisite: Theatre Arts 280, 281, or 377 or equivalent and permission of instructor. MWF 11:15–12:05. J. Allen. Screening, critical analysis, and historical and cultural context of American, Continental, and foreign cinema. An examination of its effectiveness in terms of narrative action and to the performers for whom many of their roles were designed.

477 Intermediate Film Projects] Spring. 4 credits. Limited to 12 students. Prerequisites: Theatre Arts 280, 281, or 377 or equivalent and permission of instructor. Maintenance fee, $25. M. Rivchin. Students work in small crews to produce a short dramatic film and/or a short documentary film, using synchronous sound film and editing equipment. Equipment is provided, but students must pay for film and processing (average cost, $125).

495 Honors Research Tutorial Fall or spring. 1–4 credits. Prerequisites: senior standing and departmental acceptance as an honors candidate. Hours to be arranged. Staff. Methods and modes of research for honors project.

496 Honors Thesis Project Fall or spring. 1–4 credits. Prerequisites: senior standing and departmental acceptance as an honors candidate. Hours to be arranged. Staff. Preparation and presentation of honors thesis or practicum.

[498 Fundamentals of Directing II] Fall or spring. 4 credits. Limited to 6 students. Prerequisite: Theatre Arts 398, coregistration in Theatre Arts 153, and permission of instructor. Not offered 1986–87. Fall: M W 2:30–4:25; spring: MW 11:15–1:15, plus lab to be arranged. D. Feldshuh. This course builds on the skills learned in Fundamentals of Directing I and requires that the students direct two one-act plays, as well as a number of directing projects. It will focus on the audition, rehearsal, and production process. Plays will be presented as part of the Cornell College’s Lunchtime, Cabaret, Theatre in the Classroom, or Touring presentations.

[499 Seminar in Directing] Fall or spring. 1–4 credits. Prerequisites: Theatre Arts 280, 398, or 498, or permission of instructor. Not offered 1986–87. Hours to be arranged. D. Feldshuh. This seminar will give the student the opportunity to direct a full evening of theatre. It will also involve an internship with a prominent director on campus and a final paper focusing on a specific aspect of directing.

575 American Mime Orientation I Fall. 2 credits. Prerequisite: Theatre Arts 280 and permission of instructor. Students enrolled in American Mime must contact the Department of Theatre Arts about supplies one month before the beginning of classes. Registration only through department roster in 110 Lincoln Hall. MW 12:20–2:15. S. Rivchin. American Mime is a unique performing art created by a particular balance of playing, acting, moving, pantomime, and theatrical equipment. It is a complete theatre medium defined by its own aesthetic laws, terminology, techniques, script material, and teaching methods, in which non-speaking actors, in characterization, perform the symbolic activities of American Mime plays through movement that is both telling and beautiful.

576 American Mime Orientation II Spring. 2 credits. Prerequisite: Theatre Arts 575 or permission of instructor. Registration only through department roster in 110 Lincoln Hall. F 2:30–4:25. P. Curtis and other teachers from the American Mime Theatre.


653 Myth onto Film (also Anthropology 653) Fall or spring. 4 credits. Open to undergraduate and graduate students with permission of the instructor.

Prerequisite: some knowledge of any one of the following: anthropology, film, graphics, drawing, and painting.
In myths, whales fly, pebbles throw themselves across streams, and trees are transformed into women. Toward the end of visualizing myths—in particular the myths of other people—we explore the possibilities of animated film. The technique used is cameraless animation; that is, we draw and paint, frame by frame, directly onto movie film. The intellectual problem is to visualize the myths of others so that they are comprehensible to us and not thought to be of us. Reading includes introductory works on both myth and animation, and there is background reading on the particular myth that is committed to film.

660 Visual Ideology (also German 660) Spring. 4 credits.
HOURS TO BE ARRANGED. G. Waite.
Some of the most interesting and influential approaches to visual objects have come from the peripheries of traditional art history and criticism. This seminar will analyze some of these approaches so as to understand the interactions between the disciplines of art history and criticism and such fields as philosophy, psychoanalysis, film and literary theory, and sociology. More specifically, we will attempt to advance a dialectical interpretation of the ideological and sociopolitical determinations on the reciprocal production and consumption of visual artifacts. Readings taken from Althusser, Barthes, John Berger, Benjamin, Blyson, T. J. Clark, Freud, Gadamer, Carlo Ginzburg, Hadjinicolau, Hauser, Klingender, Kristeva, Lacan, Lenin, MacCabe, Marx, Marx, Nietzsche, Ortega, Plekhanov, Max Raphael, Sontag, and Walz. Examples of artifacts for analysis will be drawn primarily from the history of oil painting, but we will discuss other types as well, including photography and cinema.


679 Bertolt Brecht in Context (also German Literature 679 and Comparative Literature 679) Spring. 4 credits. Requirements: seminar paper that will form the basis for an oral presentation for class discussion. No. of credits: 4. B. Battrick.

Brecht’s theory and dramatic praxis will be examined in the light of a twofold context: (1) the relation of selected plays and writings to the historical contingencies of Weimar and exile periods in which they emerged; (2) in later periods: an analysis of the reception and various readings of these same works by later writers and critical publics in West Germany, East Germany, and the United States as a way of understanding the changing nature of aesthetic values in the postwar period. Special attention will be given to the importance of Marxism for Brecht’s art, as well as the author’s role as a representative of the cultural avant-garde.

699 Seminar in the Theories of Directing Spring. 1–3 credits. Permission of instructor and department. HOURS TO BE ARRANGED. D. Feldshuh.

700 Introduction to Research and Bibliography in Theatre Arts Fall. 1 credit. Enrollment limited to students in Theatre Arts 633 or 636.
A study of methods and materials relevant to the solution of problems in theatre arts, including introduction to standard research sources, problems of translation, and preparation of theses and publications.

701 Stage Movement and Combat Fall and spring. 2 credits each semester. May be repeated for credit. Limited to students in M.F.A. professional actor training.

Development of the physical body for expression through various techniques and practice, including effort-shape; improvisation; composition; modern dance and ballet; period dance; stage combat technique in foils, epees, sabres, and dagger; tumbling; aikido and stage fighting; combat choreography.

730 Dramatic Text Analysis Fall and spring. 2 credits each semester. May be repeated for credit. Limited to students in M.F.A. professional actor training program. Others by permission of instructor.
M W 1–2:30. Staff.
An examination of selected works of dramatic literature for theatre artists. Intensive study of the play’s text for techniques in interpretation, character development, plot articulation, and the aesthetics of prose and poetry for performance.

751 Rehearsal and Performance Fall. 2 credits. May be repeated for credit. Limited to students in M.F.A. professional actor training.
Staff.
Study, development, and performance of assigned roles.

752 Rehearsal and Performance Spring. 2 credits. May be repeated for credit. Limited to students in M.F.A. professional actor training.
Staff.
Study, development, and performance of assigned roles.

781 Acting Technique II Fall and spring. 2 credits each semester. Limited to students in second-year M.F.A. professional actor training. Prerequisite: Theatre Arts 780.
Development and integration of the personal dynamics into the total acting process.

782 Voice Technique II Fall and spring. 2 credits each semester. Limited to students in second-year M.F.A. professional actor training. Prerequisite: Theatre Arts 782.
Practice, development, and expansion of work presented in Theatre Arts 782. Use of text to explore vocal action and voice as an integral part of developing characterization.

785 Speech Technique II Fall and spring. 2 credits each semester. Limited to students in second-year M.F.A. professional actor training. Prerequisite: Theatre Arts 784.
Refinement of sound distinction and execution; study of dramatic texts in prose and poetry; monologue and top techniques in scansion, emphasis, rhythm, range, and melody.

880 Master’s Thesis

990 Doctoral Thesis and Special Problems

Ukrainian
See Modern Languages, Literatures, and Linguistics.

Vietnamese
See Modern Languages, Literatures, and Linguistics.

Special Programs and Interdisciplinary Studies

Africana Studies and Research Center

The Africana Studies and Research Center is concerned with the examination of the history, culture, intellectual development, and social organization of Black people and cultures in the Americas, Africa, and the Caribbean. Its program is structured from an interdisciplinary and comparative perspective and presents a variety of subjects in focal areas of history, literature, social sciences, and Swahili language and literature.

The center offers a unique and specialized program of study that leads to an undergraduate degree through the College of Arts and Sciences, and a graduate degree, the Master of Professional Studies (African and Afro-American), through the University’s Graduate School.

A student may major in Africana studies; however, another alternative approach is the center’s joint major program. This program enables the student to complete a major in any of the other disciplines represented in the college while at the same time fulfilling requirements for a major in Africana Studies. This requires only a few more credits than is usually the case when one completes a single major course of study. Courses offered by the center are open to both majors and nonmajors and may be used to meet a number of college distribution requirements, such as Freshman Seminars, language (Swahili), expressive arts, social sciences, and history.

The center also brings distinguished visitors to the campus, sponsors a lecture series, and has an occasion arranged study tour to Africa and the Caribbean.

The Africana Major

The undergraduate major offers interdisciplinary study of the fundamental dimensions of the Afro-American and African experiences. Because of the comprehensive nature of the program, it is to the students’ advantage to declare themselves Africana majors as early as possible. The following are prerequisites for admission to the major.

Students should submit:
1) a statement of why they want to be an Africana studies major;
2) a tentative outline of the area of study they are considering (African or Afro-American) for the undergraduate concentration; and
3) a full transcript of courses taken and grades received.

The center’s undergraduate faculty representative will review the applications and notify students within two weeks of the status of their request.

After acceptance as a major in the Africana Center, a student must maintain a C+ cumulative average in the center’s courses while completing the major program. The Africana major must complete 36 credits in courses offered by the center, to include the following four core courses: ASARC 231, 290, 360, and 431. Beyond the core courses, the student must take 8 credits of center courses numbered 300 or above and 15 credits numbered 300 or above. Within this selection the student must take at least one of the following AS&R&C courses: 203, 204, 283, or 301. The program of an undergraduate major may have a specifically Afro-American focus or a specifically African focus.
Joint Majors

The center encourages joint majors in the College of Arts and Sciences and in other colleges. Joint majors are individualized programs that must be worked out between the departments concerned. The center's undergraduate faculty representative, Professor Cross, will assist students in the design and coordination of joint major programs. However, in any joint major program, the center will require at least 16 credits be taken in Africana studies courses, including AS&RC 290.

Double Majors

In the case of double majors (as distinct from joint majors) students undertake to carry the full load of stipulated requirements for a major in each of the two departments they have selected.

Honors. The honors program offers students the opportunity to complete a library research thesis, a field project in conjunction with a report on the field experience, or a project or experiment designed by the student. The requirements for admission to the honors program for all students—regular majors, joint majors, and double majors—are a B– cumulative average in all courses and a B+ cumulative average in the center's courses. Each student accepted into the honors program will have an honors faculty committee consisting of the student's adviser and one additional faculty member, which is responsible for final evaluation of the student's work. The honors committee must approve the thesis or project before May 1 of the student's junior year. The completed thesis or project should be filed with the student's faculty committee by May 10 of the senior year.

Distribution Requirement

Two Africana Studies and Research Center courses from the appropriate group may be counted in fulfillment of one of the following distribution requirements:

- **Social Sciences**: AS&RC 131, 132, 133, 134, 302, 303, 344, 345, 351, 352, 400, 410, 420, 460, 484, 485, 495, 550, 551, 571.
- **Humanities**: AS&RC 219, 222, 431, 432, 455, 425.
- **Freshman Seminars**: AS&RC 137, 138, 171, 172, 203, 204, 231, 290.

Note: Students who are not AS&RC majors may petition to satisfy a second requirement with center courses if they are carrying a heavy program at the center.

Language Requirement

Swahili fulfills the College of Arts and Sciences language requirement. Successful completion of AS&RC 202 gives proficiency in Swahili. Africana majors are not required to take Swahili, but the center recommends the study of Swahili to complete the language requirement.

Courses

131 **Swahili** Fall. 4 credits. W R 10-12; lab to be arranged. A. Nanji.

132 **Swahili** Spring. 4 credits. Prerequisite: Swahili 131.

133 Swahili Fall. 4 credits. Prerequisites: Swahili 131 and 132. W R 2:30-4:25; language lab to be arranged. A. Nanji.

Advanced study in reading and composition.

134 **Swahili** Spring. 4 credits. W R, hours to be arranged. A. Nanji.

In this course the sequence more emphasis is placed on the development of reading ability and the acquisition of writing skills. Students are expected to read and comprehend selected Swahili stories and write compositions on chosen topics. Ample consideration is given to oral practice in the classroom.

137 **Afro-American Writing and Expression** Fall. 4 credits. T R 10-10. A. Graves.

Designed to promote clear and effective communication skills, using Black-oriented materials as models for writing assignments and oral discussions.

138 **Reading and Writing from Classics in Afro-American Prose** Spring. 3 credits. T R 10-10-12:05. A. Graves.

This course introduces students to the classics of the Afro-American experience in nonfiction. Essay, biography, journalism, and other work from writers such as Frederick Douglass, W. E. B. DuBois, Langston Hughes, Zora Neale Hurston, Malcolm X, James Baldwin, and Alice Walker provide the materials on which students' writing and research skills are exercised.

171 **Black Families and the Socialization of Black Children** Fall. 4 credits. T R 3:10. W. Cross.

Survey of key psychological dimensions of the Black experience, covering such issues as (1) race and intelligence; (2) Black identity; (3) Black family structure; (4) Black English; (5) Black middle class; and (6) nature of Black psychology.


A course designed for freshmen and sophomores that will be devoted to the history of Black education and contemporary issues in Black education, such as the struggle for Black studies and the development of independent Black schools, and problems of public schools in Black communities.


This course directs attention to the salient characteristics of Africa's political systems and assesses the way in which continental and global factors impose on and interact with African political systems. It is especially concerned with the impact of colonialism and the ongoing efforts by Africans to overcome its political and socioeconomic legacies. Among the specific issues to be discussed are problems of ethnic fragmentation, boundary problems, levels of political institutionalization, challenges of continental unity, neo-colonialism and dependency, and Africa within the Third World and in the world system.

202 **Swahili Literature** Fall. 4 credits. Prerequisite: Swahili 134. Offered on demand. A. Nanji.

Students gain mastery over spoken Swahili and are introduced to the predominant Swahili literary forms.

203 **History and Politics of Racism and Segregation** Fall. 4 credits. T R 12:20-2:15. C. Mbata.

A cross-cultural study, in historical context, of the evolution of racist thought and practice in southern Africa and North America.

204 **History and Politics of Racism and Segregation** Spring. 4 credits. T R 12:20-2:15. J. C. Mbata.

The course will deal with the historical patterns of racism and segregation using southern Africa and North America as case histories. The study will be undertaken within a theoretical framework that broadly defines racism and segregation and their implication.

219 **Issues in Black Literature** Fall. 4 credits. Offered alternate years.

An examination of literature written for Black children, including an analysis of the literature as it pertains to Black life from 1600 to the present. Students write a pamphlet containing their essays, fiction, and poetry and compile a bibliography of literature for Black children.

231 **Black Political Thought** Fall. 3 credits.


This is an introductory course that will review and analyze the major theoretical and ideological formulations developed and espoused by African-Americans in the struggle for liberation. This semester we will focus specifically on the political philosophy and historical significance of Malcolm X, the work and movement of Marcus Garvey, as the prime movers of nationalism and pan-Africanism among Black people in this century. Such themes as slave resistance, nationalism, pan-Africanism, emigration, anti-imperialism, socialism and internal colonialism, and the political and social views of Black women will be discussed. Black political thought will be viewed in its development as a response to concrete conditions of oppression and expression.

283 **Black Resistance: South Africa and North America** Fall. 4 credits. Offered alternate years. C. Mbata.

A study of Black political movements in South Africa and North America and their responses to the situations of race relations that formed the contexts of their operations.

285 **Black Theater and Dramatic Literature** Fall or spring. 3 credits.


This course is an introduction to the history of Black drama. It will provide the means through which students can cultivate their interests in Black dramatic literature and production techniques. Each student will participate in the production of a play to be performed during the semester. There will be at least one trip to New York City to see a Black theater production.

290 **The Sociology of the Black Experience** Fall. 3 credits.


An introductory course to the sociology of the Black experience and its historical and contemporary development within a theoretical framework that broadly defines racism and its social and psychological implications.

301 **Oppression and the Psychology of the Black Social Movement** Spring. 4 credits.


The focus of the course will be conversion experiences within the context of social movements. It will explore the development of political groups (for example, the Black Panther Party) and outstanding activist-intellectuals (such as Malcolm X) are used as reference points for discussion of social movement theory.

302 **Social and Psychological Effects of Colonialization and Racism** Spring. 4 credits. Offered alternate years. Staff.

303 **Blacks in Communication Media and Film Workshop** Spring. 3 credits.

The focus is on the general theory of communications, the function of media in an industrialized society, and the social, racial, and class values implied in the communication process. There are group writing projects, a term paper, and the screening of significant American and Third World films.
The course is designed to explain why Africa's public administrations in the postcolonial era have generally failed to move from the colonial ethos to becoming primary instruments for initiating and guiding the processes of development. The reality of colonialism was bureaucratic centralism—the closest approximation to a real type of a pure administrative state specializing in law and order. Colonial administrations resembled armies in their paramilitary formation and ethos and were, indeed in a number of cases, the instruments of military men. Much attention focuses on the internal characteristics of bureaucratic organizations in Africa and their relationship to their social and political environments.

345 Afro-American Perspectives in Experimental Psychology (also Psychology 345) Spring. 3 or 4 credits. Prerequisite: An introductory course in psychology or AS&RC 171. Offered alternate years.

346 African Socialism and Nation Building Spring. 4 credits.
An exploration and critical analysis of the various theories of African socialism as propounded by theorists and practitioners. Those ideas, extending from Nyerere's Ujamaa (for example, traditional social and economic patterns of African society) to Nkrumah's scientific socialism (such as the desirability and practicality of the Marxian type of socialism in Africa) are compared.

350 The Black Woman: Social and Political History Spring. 3 credits. Offered alternate years.

351 Politics and Social Change in the Caribbean Fall. 4 credits. M W 10:10–12:05. L. Edmondson.
A study of the historical, geostrategic, political, economic, and social (including racial and cultural) forces bearing on the development of the Caribbean and its models of development; the continuing salience of struggles for change and transformation; prospects of regional integration; and Caribbean challenges to the global system, especially with regard to the region's relations with the United States in the context of the East-West conflict and its position in the Third World in the context of the north-south cleavage.

352 Pan-Africanism and Contemporary Black Ideologies Spring. 4 credits. Offered alternate years. A historical study of pan-Africanism that reviews and analyzes the literature and activities of early Black pan-African theorists and movements.

An introduction to African history beginning with early civilizations in pre-colonial Africa.

361 Introduction to Afro-American History (from African Background to the Twentieth Century) Fall. 3 credits. M W F 10:10. R. Harris.

Examines the transition of Afro-Americans from countryside to city through the process of migration and urbanization and their transformation into industrial laborers. Probes the transition from segregation to civil rights through the process of protest and the transformation of Afro-Americans from second-class into first-class citizens. The purpose is to understand historical antecedents for the current socioeconomic, political, and cultural status of Afro-Americans.

A survey of the current problems on the African continent as they have appeared from 1650 to the present time. Topics include the impact of the Atlantic slave trade, the European scramble of 1884, various forms of African resistance to colonial occupation in 1914, and the prospects of protracted social unrest in Africa south of the Zambezi River.

382 Comparative Slave Trade of Africans in the Americas Fall. 3 credits. T R 1:25–2:30.
The focus is on eighteenth- and nineteenth-century slave societies in Virginia and South Carolina and the eighteenth-century slave societies in San Domingue or Haiti and some extent in Jamaica. The slave society in Cuba during the latter part of the nineteenth century is studied.

An exploration of the processes of African underdevelopment, ranging from historical foundations to contemporary international dynamics. Rival theories of underdevelopment, competing models of development, and competing ideologies will be explored. Common African postures as manifested in the "Lagos Plan of Action for the Economic Development of Africa, 1980–2000" and in the north-south dialogue will also be assessed.

A review of the intellectual and political history of the Black experience in the United States from 1890 to the eve of World War II. Although the course concentrates on two of the outstanding Black historical figures of the period, Booker T. Washington and W. E. B. DuBois, other personalities and leaders within Black social and political history will be examined—including Marcus Garvey, T. Thomas Fortune, Phyllis Randsdorph, Charles S. Johnson, William Monroe Trotter, and James Weldon Johnson. Major Black issues, such as the intellectual debates between DuBois and Washington, and DuBois versus Garvey, will constitute a critical part of the discussion.

The course is designed to engage students in a survey and analysis of the theoretical and empirical basis of Black politics in America. It is a sociopolitical investigation and evaluation of the variety of practical political activities among Black people in the United States.


A study of the reading of twentieth-century novels and short stories from English-speaking and French-speaking sub-Saharan Africa, students will consider such questions as the influences of colonialism and independence on literary creativity and the contribution of the writer to the development of Africa. Representative authors to be studied will include Laye, Oyono, Acchebe, Soyinka, Amah, Abrahams, and Ngugi. All works will be read in English.

425 Advanced Seminar in Black Theater and Dramatic Literature Fall or spring. 4 credits. T R 2:15–3:30. W. Branch.
This course will involve the study and analysis of selected plays from the Black theater repertoire, together with their relationship to key aspects of the Black experience in America. Materials will range from some of the earliest plays produced by Black American playwrights, in the mid-1800s, through dramas surfacing early in the twentieth century, on into the blossoming of Black dramaturgy during the mid-1900s and a consideration of works by such contemporary playwrights as Amira Baraka, Ed Bullins, Charles Fuller, and Smm-Art Williams. A field trip to a Black theater attraction actually on the boards in New York City is anticipated.

431 History of Afro-American Literature Fall. 4 credits.
An extensive examination of the impact that Afro-American literature has had on describing, explaining, and projecting the Afro-American experience from 1619 to the present.

432 Modern Afro-American Literature Spring. 4 credits. A study of fiction by Black writers, focusing on the political and sociological component that influenced the development and evolution of Black writing in relationship to literary themes and attitudes current in specific periods and movements from post–World War II to the present.

455 Modern Caribbean Literature Spring. 4 credits. W 2–4:25. A. Graves.
This course will examine the prose literature of the Caribbean Islands. Through the reading of several novels and short stories from the various languages and cultural strains that comprise the Caribbean societies, students will study the points of commonality and the diversity within this body of literature. The recurrence of certain historical, social, and cultural issues that have formed the multi-ethnic Caribbean peoples will be analyzed in their varying manifestations across the linguistic and cultural landscapes that are inextricably entwined with the underlying shared experience.

The overall objective of this course is to develop in the student an understanding of the origins of the philosophical, theological, and religious teachings that were responsible for producing what is today called Judaism, Christianity, and Islam. From this juncture, an exploration will be made of the most basic works and teachings for the Nile Valley and the Great African Lakes, and African religions will be compared to the adoptions in Hebrew, Christian, and Moslem religions, as well as in what is today called Greek philosophy.
475 Black Leaders and Movements in Afro-American History Spring. 4 credits.
T R 3:35. R. Harris
American leadership, personalities, ideas, and activities central to the struggle for Afro-American liberation from the eighteenth-century to the present. Examines theories of leadership and the structure of protest movements with the goal of understanding current leadership needs and trends among Afro-Americans.

483 Themes in African History Fall. 4 credits.
T 7–10 p.m. L. Edmondson
The focus is on escalating conflicts and ongoing transformations in South Africa and the increasingly salient issue of race relations with the apartheid regime. Topical emphases include the highlighting contradictions of apartheid; the rising tide of Black resistance; women under and against apartheid; Southern Africa in relation to its neighbors; geopolitical, economic, and racial dimensions of the American connection; the disinvestment-divestment debate; and the Reagan administration's "constructive engagement" policy under challenge. Instructor's lectures will be supplemented by films, class discussion, and guest lectures.

485 Racism, Social Structure, and Social Analysis Seminar Spring. 4 credits.
W 2–4:25. J. Turner
An examination of the social structure of American society and the relationship of racial and class categories to social stratification. An analysis of power structures and the social salience of socioeconomic connections of government decision makers and the corporate structure is developed.

490 Advanced Reading and Research Seminar in Black History Spring. 4 credits.
M W 1:25–2:15. C. Mbata
The seminar is designed to help students acquaint themselves with the available sources of information and materials in Black history, as well as make the maximum use of their own inclinations and interests in unearthing the material and creating a body of comprehensive conclusions and generalizations out of them.

495 Political Economy of Black America Spring. 4 credits.
M W 10:30–12:05.
An examination of the role that Black labor has played in the historical development of United States monopoly, capitalism, and imperialism. Emphasis is on the theory and method of political economy and a concrete analysis of the exploitation of Black people as slave labor, agricultural labor, and proletarian labor.

498–499 Independent Study 498, Fall; 499, Spring.
Hours to be arranged. African Center faculty.
For students working on special topics, with selected reading, research projects, etc., under the supervision of a member of the African Studies and Research Center faculty.

500 Political Theory, Planning, and Development in Africa Spring. 4 credits.
T R 11:15–12:45.
The course explores the processes of under-development of Africa from the epoch of slavery through colonial and neocolonial phases of domination, drawing on the assumptions of "underdevelopment" theory à la G. Frank, Walter Rodney, and others. It then takes up the differential content and emphasis on socialistic and capitalistic strategies by highlighting the interaction of political and economic forces. Case studies are drawn from Ghana, Kenya, and Tanzania.

505 Workshop in Teaching about Africa Fall. 4 credits.
Prerequisites: AS&RC 203 and AS&RC 360 and 361 or permission of instructor. Offered alternate years.
C. Mbata

510 Historiography and Sources: The Development of Afro-American History Fall. 4 credits.
Prerequisite: upperclass or graduate standing or permission of instructor.
T 9:30–11:15. R. Harris
Studies the way Black historians in particular have explained the Afro-American past. Examines the development of writing on Afro-American history from the earliest writers to the present. Seeks to determine the principles for interpreting Afro-American history. Acquaints participants with the methodologies and sources central to understanding the Afro-American experience.

515 Comparative Political History of the African Diaspora Fall. 4 credits.
Prerequisites: upperclass or graduate standing or two of the following courses: AS&RC 203, 229, 290, 361, 473, 475, 484, 490. Offered alternate years.

520 Historical Method, Sources, and Interpretation Fall. 4 credits.
Prerequisite: upperclass or graduate standing or two of the following courses: AS&RC 203, 204, 361, 475, 484, 490. Offered alternate years.
C. Mbata

550 Transnational Corporations in Africa and Other Developing Countries Spring. 4 credits.
Prerequisites: upperclass or graduate standing or permission of instructor. Offered alternate years. Examines the role of transnational enterprises as an economic and political factor in the Third World, their relations with the host government, and their interaction with both the private and public sectors of the economy of the host country. Special emphasis on Africa and Latin America.

551 Political History of Social Development in the Caribbean Fall. 4 credits.
M W 10:10–12:05. L. Edmondson
A study of the historical, geostrategic, political, economic, and social (including racial and cultural) forces bearing on the domestic and international experiences of Caribbean societies. Special attention will be given to conflicting definitions and perceptions of the Caribbean; the role of Caribbean social structures and models of development; the continuing salience of struggles for change and transformation; prospects of regional integration; and Caribbean challenges to the global system, especially with regard to the region's relations with the United States in the context of the east-west conflict and its position in the Third World and in the context of the north-south cleavage.

571 Graduate Seminar in Black Psychology Fall. 4 credits.
Prerequisite: permission of instructor. R 9:05–12:05. W. Cross.
This is an upper-level undergraduate and graduate seminar devoted to psychological issues in the Afro-American experience. This seminar will examine the theoretical and empirical literature of Black family-kinship systems and Black self-concept.

598–599 Independent Study 598, Fall; 599, Spring.
Variable credit. For all graduate students.

698–699 Thesis 698, Fall; 699, Spring. Limited to African Studies and Research Center graduate students.

American Indian Program
R. Fougnier, director (300 Caldwell Hall, 255-6587);
S. Saraydar, asst. prof.
The American Indian Program (AIP) is a multidisciplinary, intercollege program consisting of instructional, research, and extension components. The program's instructional core consists of courses focusing on American Indian life, with an emphasis on the Iroquois and other Indians of the Northeast. Core courses are supplemented by a variety of offerings from several departments. The University has a commitment to broadening the educational opportunities and experiences of students from all backgrounds, and provides courses that enhance the awareness of all students of the unique heritage of American Indians. Students are challenged by such topics as the sovereign rights of Indian nations and the contemporary relevance of Indian attitudes toward the environment.

During the summer the AIP sponsors a program designed to educate elementary and secondary school teachers about the history and culture of American Indians with particular emphasis on Indians of New York State. The program also provides opportunity for these teachers to develop new materials and strategies for teaching about American Indians and to gain skill in presenting these materials and using these teaching strategies in a classroom situation.

A specific objective of the AIP is to assist Indian groups and organizations in the Northeast to address the issues they face. The thrust of the AIP's research and extension efforts is directed at developing solutions to problems identified by Indian people. In this way the AIP can serve as a catalyst to stimulate the application of institutional expertise and resources to community needs.

Cornell has completed replication of an authentic protohistoric Iroquois dwelling. This project is intended to facilitate the understanding of Iroquois culture by providing a study center that will serve the residents of central New York State. The instructional, research, and extension components are expected to expand and develop during the initial three years of the program. Further development of courses is expected in a number of departments. Cooperative extension is assisting in efforts to provide services to Indian communities in New York State. Research initiatives will be directed toward working with Indian groups in areas such as wildlife management, agriculture, industrial and labor relations, and social and economic development.

American Indian Studies Concentration
American Indian studies offers an interdisciplinary approach to the study of American Indian life. Course work in various colleges and departments of the University will provide a broad base for understanding the past, present, and future of Indian people. Students selecting a concentration in American Indian Studies must take five courses from those listed below. At least one course must be selected from each group. All course work must be approved by an adviser from the American Indian Program.

For full descriptions of the following courses consult the listings under individual departments.

The Indian Traditions
Anthropology 230 Ethnology of Native North America
Anthropology 242 American Indian Philosophies I: Power and World Views (also Rural Sociology 242)
Anthropology 354 The Peopling of America
Indians in Transition

Anthropology 318 Ethnology of the Iroquois (also Agriculture and Life Sciences)

History 209 Political History of American Indians

History 219 History of North American Indians

History 323–324 Native American History

History 429 American Indians in the Eastern United States

History 624 Graduate Seminar in American Indian History

Contemporary Issues

Anthropology 243 American Indian Philosophies I: Native Voices (also Rural Sociology 243)

Rural Sociology 440 Social Impact of Rapid Resource Development

[Anthropology 442 American Indian Philosophies: Selected Topics (also Rural Sociology) Not offered 1986–87]

Independent Study

Independent study courses within departments; students must have approval of an American Indian studies faculty member.

Center for Applied Mathematics

The Center for Applied Mathematics administers a broadly based interdepartmental graduate program that provides opportunities for study and research over a wide range of the mathematical sciences. This program is based on a solid foundation in analysis, algebra, and methods of applied mathematics. The remainder of the graduate student’s program is designed by the student and his or her Special Committee. For detailed information on opportunities for graduate study in applied mathematics, students should contact the director of the Center for Applied Mathematics, Sage Hall.

There is no special undergraduate degree program in applied mathematics. Undergraduate students interested in an application-oriented program in mathematics may select an appropriate program in the Department of Mathematics, the Department of Computer Science or some department of the College of Engineering.

Biology and Society Major

June Fessenden-Raden, chairperson, biology and society major, Program on Science, Technology, and Society (630 Clark Hall, 255-6042)

The biology and society major is offered to students enrolled in the College of Arts and Sciences and the College of Agriculture and Human Ecology. Undergraduates in the College of Agriculture and Life Sciences can develop an approved sequence of courses from the biology and society curriculum. The major is coordinated for students in all colleges. Students interested in this major should contact the biology and society office. Students can get information, specific course requirements, and application procedures for the major from the office in 628 Clark Hall.

Because the biology and society major is multidisciplinary, students must attain a basic understanding of each of the several disciplines it comprises: these include introductory courses in the fields of biochemistry, chemistry, mathematics, genetics, ecology, ethics, and history. In addition, majors are required to take three courses in biology and society, a set of electives, and a special senior seminar. Concentration areas incorporating these required courses are designed in consultation with faculty advisers to accommodate each student’s individual goals and interests.

Acceptance into the major requires completion of the course sequence in introductory biology. Students in the process of completing this prerequisite may be admitted to the major on a provisional basis. It is the student’s responsibility to assure that final acceptance has been granted. Although only introductory biological sciences is a prerequisite for acceptance into the major, students will find it useful to have completed some of the other requirements (listed below) by the end of their sophomore year.

Students intending to major in biology and society must apply for final acceptance into the major during their sophomore year. Students from junior status will be considered on a case-by-case basis only. Such applicants should realize the difficulties of completing the major requirements in less than two years.

Major Requirements

1) Bio Sci 100 or 101–104 or 105–106.
3) College calculus (one semester): Math 106, 108, or 111, or any higher-level calculus course.
6) History or Philosophy: B&Soc 287 (also Hist 287 and Bio Sci 201), B&Soc 288 (also Hist 288 and Bio Sci 202), Philosophy 381, or Philosophy 389.
7) Core course: B&Soc 301 (also Bio Sci 301 and Anthro 301). Note: biology and society majors are required to take the course for 4 credits in consultation with the adviser.
8) An eight-course concentration area to include genetics, ethics, and statistics. It is to be developed by the student in consultation with the adviser. See below for course requirements and some suggested concentration areas.
9) Two issues in Biology and Society courses (an up-to-date list of courses that fulfill this requirement can be obtained at the office in 628 Clark Hall).
10) Senior seminar.

Concentration Areas for the Major

Students accepted into the major must develop with their adviser a coherent and meaningful grouping of courses representative of their special interest in biology and society. Examples include biology and public policy, agriculture and society, the environment and society, health and society, and human development and society. Sample concentration areas are available in the biology and society office. Students must develop, in consultation with their adviser, their major concentrations from the following six categories:

1) a genetics course: Bio Sci 280 or 281, or Pl Br 225
2) an ethics course: B&Soc 205 (also Bio Sci 205 and Phil 245) or B&Soc 206 (also Bio Sci 206 and Phil 246)
3) a statistics course: Stats 200, I&LR 210, Ag Ec 310, Educ 352, Soc 301, Psych 350, Math 372, Econ 319, OR&E 270, or Stats 601
4) any two additional biology elective courses* from Biological Sciences, Nutritional Sciences, Agricultural Sciences, Human Development and Family Studies, Psychology, Agronomy, Animal Sciences, Entomology, Food Science, Microbiology, Natural Resources, Plant Pathology, and Veterinary Medicine
5) two social science electives†
6) one humanities elective‡

*These courses must have substantial biology content. Not all courses in the listed departments and divisions satisfy this requirement.
†Issues in Biology and Society—Social Science courses may be used to meet this requirement.
‡Issues in Biology and Society—Humanities courses may be used to meet this requirement.

Issues in Biology and Society

This requirement is designed to help students achieve some breadth. Students must take at least one course from the natural sciences and one course from either the humanities or the social sciences. Students should consult with their adviser when choosing the courses to meet this requirement. A list of courses that may be used to fulfill the requirement can be obtained at the biology and society office.

Independent Study

Projects under the direction of a Biology and Society faculty member are encouraged as part of the program of study within the student’s concentration area. Applications for research projects are accepted by individual faculty members. Students may enroll for 1–4 credits in Biology and Society 375 (Independent Study) with written permission of the faculty supervisor and may elect either the letter grade or the S/U option. Students from the College of Arts and Sciences and Agriculture and Life Sciences may elect to do an independent study project as an alternative to, or in advance of, an honors project. Information on faculty research, scholarly activities, and undergraduate opportunities is available in the biology and society office, 628 Clark Hall. Independent study credits may not be used in completion of the major requirements.

Honors Program

The honors program is available to biology and society majors from the Colleges of Arts and Sciences and Agriculture and Life Sciences and is designed to challenge the academically talented undergraduate student. Students who enroll in the honors program are given the opportunity to do independent study and to develop the ability to evaluate research dealing with issues in biology and society. Students participating in the program should find the experience intellectually stimulating and rewarding.

Selection of Students

During the first three weeks of the fall semester seniors majoring in biology and society are considered for entry into the honors program by the Honors Program Committee. Applications for the honors program are available at the biology and society office, 628 Clark Hall. To qualify for the honors program, students must explain how the honors work will fit into their overall program. They must have an overall Cornell cumulative grade-point average of at least 3.00 and at least a 3.30 cumulative grade-point average in all courses used to meet the major requirements. Students in the College of Agriculture and Life Sciences must also meet the requirements of that college and be selected by one of the existing college committees.

If, after admission to the honors program, a student fails to maintain a high scholastic average, or for any other reason(s) he or she is considered unsuited for honors work, the student reverts to candidacy for the regular bachelor’s degree. The student who does not continue in the honors program receives credit for any work passed in the program but is not eligible for a degree with honors.

The opportunity for independent study is available to all students as an alternative to, or in advance of, an honors project. Honors projects cannot be used to fulfill the senior seminar requirement for the major.

Program Requirements

The satisfactory completion of a special project and the writing of an honors thesis are required. The project must include substantial research. The completed work should be of wider scope and higher quality than the work normally required for an advanced course. Initiative for formulation of ideas, developing the proposal, carrying out the study, and preparation of a suitable thesis all lie with the student. Honors projects...
must be under the direction of two advisers, one from biology and society and the other a member of the Cornell faculty who has agreed to act as thesis adviser. The approval of the member of the Biology and Society faculty who has agreed to act as thesis adviser.

Students in the College of Agriculture and Life Sciences 499, because it is a special honors course, is to be taken in addition to those courses that meet the regular major requirements. Registration for honors projects should be done only after consultation with the biology and society chairperson.

Honors Thesis

Students and their advisers should meet regularly during the period of research and writing for the thesis. The student is responsible for scheduling these meetings, and for carrying out the research agreed upon, rests with the student. Advisers are expected to make themselves available for discussion at the scheduled times and to offer advice on the plan of research, as well as provide critical and constructive comments on the written work as it is completed. They are not expected, however, to have to pursue students either to arrange meetings or to ensure that the research and writing are being done on schedule.

There is no prescribed length for a thesis, since different topics may require longer or shorter treatment, but it should normally be no longer than seventy double-spaced, typed pages. When a thesis has been completed in a form generally satisfactory for purposes of evaluation, the candidate must meet with the thesis advisers and one member of the Honors Program Committee and formally defend the thesis. This should be no later than the last day of classes. Any student would be well advised, however, to provide reviewers with a polished draft at least four weeks prior to the last day of classes and defend his or her thesis well in advance of the end of classes, to allow time for revisions. All pull the honors work to faculty and students will be scheduled at the end of the student’s last semester.

Course Requirements

499 Honors Project

Fall or spring; two-semester project acceptable; 3–5 credits each term with a maximum of 8 credits for entire project. Open only to Biology and Society honors students in their senior year.

Staff.

Students enrolled in Biology & Society 499 will receive a letter grade at the end of their final term, whether or not they complete a thesis and whether or not they are recommended for honors. Students enrolled for the whole year in 499 may receive either a letter grade for both terms or a grade of “R” for the first term and a letter grade for both terms if submitted at the end of the second term. When a student is enrolled for two terms, the student and the thesis adviser must reach a clear agreement at the outset as to which grade will be assigned for the first term and on the basis of what sort of work. Minimally, an honors thesis outline and bibliography should be completed during the first term.

Evaluation and Recommendation

Two copies of the completed and defended thesis (suitably bound in a plastic or hard-backcovered box), together with the advisers’ recommendations, must be submitted to the Honors Program Committee by the first day of study period of the student’s final term. Following the formal defense of the thesis, the thesis adviser each submits to the Honors Program Committee a recommendation that includes (1) an evaluation of the honors work and the thesis; (2) an evaluation of the student’s academic record in the biology and society major; and (3) a recommendation for or against awarding honors. (For College of Arts and Sciences students a justification for the level of honors proposed must be included.)

Copies of the thesis and recommendations will be circulated to the Honors Program Committee. Because the committee may have little knowledge of the subject area or area of the thesis, letters of recommendation should be carefully prepared to help the committee ensure consistency within the honors program. Unless there is serious disagreement, the recommendation of the advisers should stand. If there is disagreement, the Honors Program Committee will make the decision after consultation with the interested parties.

Freshman Seminars

For up-to-date information consult the Freshman Seminar Brochure.

General Undergraduate Courses

205 Medical Ethics (also Biological Sciences 205 and Philosophy 245) Fall. 4 credits. Limited to 50 students. Prerequisite: Philosophy 115, permission of instructor required for graduate students.

M W F 1:25–2:15, plus disc to be arranged. M. Wachseberg.

Critical analysis of the conceptual framework in which ethical problems associated with medicine can be formulated and evaluated. General topics (with sample issues) include basic concepts such as illness, death, autonomy, and personhood (abortion, euthanasia, procreative technologies), allocation of medical resources (entitlement to health care, access to health care, cost-benefit analysis), and the professional–patient relationship (information consent, confidentiality, and medical paternalism).

206 Environmental Ethics (also Biological Sciences 206 and Philosophy 246) Spring. 4 credits. Open to sophomores, juniors, and seniors; permission of instructor required for graduate students.

M W F 1:25–2:15, plus disc to be arranged. M. Wachseberg.

Critical analysis of conceptual framework in which policies affecting the environment are formulated and judged. One major component of the course deals with the nature and extent of obligations to spatially distant people, future generations, nonsentient things (e.g., the ecosystem). The other major component of the course deals with the appropriate analysis of the origin and resolution of environmental problems. Topics include individual versus collective goods, cost-benefit analysis, and coordination problems.

232 Recombinant DNA Technology and Its Applications (also Biological Sciences 232) Spring. 3 credits. Disc limited to 20 students.

Prerequisite: one year of introductory biology. S-U grades optional. There is a possible fee for course reading material.

287 History of Biology (also History 287 and Biological Sciences 201) Fall. 3 credits. Prerequisite: one year of introductory biology. 287 is not a prerequisite to 288. S-U grades optional.


An examination of the history of biology, emphasizing the interaction of biology and culture. Original writings of biologists constitute the bulk of reading assignments. This semester covers the period from classical antiquity to 1900.

288 History of Biology (also History 288 and Biological Sciences 202) Spring. 3 credits.

Prerequisite: one year of introductory biology. 287 is not a prerequisite to 288. S-U grades optional.


An examination of the history of biology, emphasizing the interaction of biology and culture. Original writings of biologists constitute the bulk of reading assignments. This semester is devoted entirely to twentieth-century biology.

301 Biology and Society I: The Biocultural Perspective (also Anthropology 301 and Biological Sciences 301) Fall. 3 or 4 credits (4 credits by arrangement with instructor). Biology and society majors are required to take the course for 4 credits. Prerequisite: one year of introductory biology. S-U grades optional. This is the core-course requirement for the biology and society major and is also available to other students who have fulfilled the necessary prerequisites.


In modern evolutionary theory, human biology, behavior, and institutions are understood as the ongoing products of interactions between human biological evolution and cultural change. Nevertheless, numerous attempts to examine the evolutionary processes in humans violate key tenets of evolutionary theory, unwittingly reproducing elements of pre-Darwinian views of human nature and culture. In the pre-Darwinian context and reading The Origin of Species, the course explores attempted applications of evolutionary analysis to humans and develops a cultural exploration of the persistence of pre-Darwinian elements in many of them.

302 Food, Agriculture, and Society (also Biological Sciences 302) Spring. 3 credits.

Prerequisite: an introductory biology course required, an introductory ecology course recommended, or permission of instructor. S-U grades optional. Limited to 20 students. There is a possible fee for course reading material.

Lecs, T R 1:25 plus disc to be arranged. A. Power.

A multidisciplinary course that deals with the social and environmental impact of food production in the United States and developing countries. Agroecosystems of various kinds are analyzed from biologic, economic, and social perspectives. The impacts of traditional, conventional, and alternative agricultural technologies are critically examined in the context of developed and developing economies. Specific topics include pest management, soil conservation, farm labor, land reform, and international food policy. The relationship between population, food production, and socioeconomic structure is also discussed.

311 Professional Ethics

Spring. 4 credits. Limited to 20 students. Prerequisite: permission of instructor. Fee for course reading material, $15.

Lecs, R 2:30–4:25. S. Brown, Jr.

An examination of the professions, their role in society, and the moral problems and conflicts inherent in professional life and practice.

312 The Anthropology of Medicine (also Anthropology 321) Spring. 3 credits.

Limited to 15 students. Prerequisites: Anthropology/Biological Sciences/Biology and Society 301 and permission of instructor.


An examination of contemporary medical systems from an anthropological perspective and an evaluation of current approaches to the anthropology of medicine.

347 Human Growth and Development: Biological and Social Psychological Considerations (also Human Development and Family Studies 347 and Nutritional Sciences 347)  Spring. 3 credits. Prerequisites: Biological Sciences 101 or 109 or equivalent, and Human Development and Family Studies 115 or Psychology 101. Lec, M W F 1:25–2:15. J. Haas, H. Ricciuti. A review of major patterns of physical growth from the fetal period through adolescence, with consideration of biological and socio-environmental determinants of growth as well as physical and psychological consequences of variations in growth patterns. An examination of normal patterns of growth is followed by an analysis of major sources of variations in growth (normal and atypical).

375 Independent Study  Fall or spring. 1–4 credits. Prerequisite: written permission of faculty supervisor. S-U grades optional. Staff.

386 Culture and Human Disease (also Anthropology 386)  Fall. 4 credits. Prerequisite: one biology or one anthropology course.

395 Introduction to Public Health (also Human Service Studies 490)  Fall. 4 credits. Prerequisite: permission of instructor. S-U grades optional. Possible fee for reading material. Not offered 1986–87. Next offered 1987–88. M W F 10:10 plus one hour to be arranged. J. L. Ford. Attention is given to assumptions and concepts that underlie social responsibility for health. Reviews of human behavior in the social environment are presented in relation to health and disease and the rationale for various public health policies and programs. Case studies are used to apply principles and concepts from readings and lectures.

404 Senior Seminar: Human Fertility In Developing Nations (also Sociology 404)  Fall. 4 credits. Prerequisite: Sociology 430 or permission of instructor. Offered alternate years. Not offered 1986–87. L 2:30–4:25. J. M. Fessenden-Raden. A review of the major literature dealing with the social causation of variation in human fertility. Emphasis will be on international comparisons and on the methodology of field research.

406 Senior Seminar: Issues in Biotechnology, Society, and Law (also Biological Sciences 406)  Spring. 4 credits. Limited to 20 students. Prerequisites: a course in genetics and biochemistry, or written permission of instructors. S-U grades optional. There is a possible fee for course reading material.

408 Senior Seminar: Agriculture, Society, and Biotechnology (also Rural Sociology 408)  Spring. 3 credits. Prerequisites: two courses in the social sciences and two in agricultural sciences. Offered alternate years. Not offered 1986–87.

409 Health and Welfare Analysis (also Management MBA 685)  Fall. 3 credits. Lec, W 1:25–4:25. F. Buttel. An examination of the socioeconomic aspects of biotechnology in the context of historical patterns of technological change in agriculture in developed and developing countries. Background is provided on scientific aspects of biotechnology. The major topics covered include the social organization of genetic engineering research, industry-university relationships, and the impact of genetic engineering on agriculture.

410 Senior Seminar: The History of Biology—Evolution (also History 447)  Fall. 4 credits. Limited to 20 students. A Common Learning course.

411 Senior Seminar: The History and Ecological Consequences of Nuclear War (also Peace Studies 402)  Fall. 4 credits. Limited to 15 students. Prerequisite: permission of instructor. Offered alternate years; not offered 1986–87.

412 Senior Seminar: The History of Biology—History of the Conflict between Science and Religion (also History 448)  Spring. 4 credits.

414 Senior Seminar: Population Policies (also Sociology 414)  Fall. 4 credits. Prerequisite: graduate standing or permission of instructor. Offered alternate years.

415 Senior Seminar: The Politics of Technical Decisions I (also Sociology 515, City and Regional Planning 541, Management MBA 586, Government 586)  Fall. 4 credits. Lec, W 2:30–4:25. D. Nelkin. Political aspects of decision-making in technical areas. Drawing from recent risk disputes, we will examine the origins and characteristics of "technical politics," the role of experts in government, and the problem of expertise in a democratic system.

426 Medicine and the Law  Fall. 4 credits. Prerequisite: Biology and Society 301 or 311 or permission of instructor. Letter grades only. There is a possible fee for copying charges.

428 Senior Seminar: Medical Service Issues in Health Administration (also Biological Sciences 469 and Human Service Studies 628)  Spring. 3 credits. Sec, M W F 2:30–3:20. V. Utomhoren. A survey of the issues that affect interactions between the health care consumers and the health-care team, including disease processes (how disease occurs and progresses), the health-care team and illness, third-party payment and illness, and resource allocation.

442 Senior Seminar: Social and Political Studies of Science (also Sociology 355 and City and Regional Planning 442)  Spring. 3 credits.

449 Senior Seminar: Risk Management of Toxic Chemicals  Fall. 3 credits. Limited to 12 students. Prerequisites: a course in biochemistry or toxicology or permission of instructor. Offered alternate years.

451 Senior Seminar: The Politics of Technical Decisions II (also Sociology 516, City and Regional Planning 542, Management MBA 587)  Fall. 4 credits. Lec, W 2:30–4:25. D. Nelkin. Select cases of chemical-risk communication and risk management by government agencies, communities, industries, and individuals will be reviewed. Potential topics to be included are toxic wastes, groundwater contamination, chemical accidents, and community rights-to-know. The roles of social, economic, political, legal, and ethical factors in decision making will be discussed. Readings from the various disciplines, including scientific papers and reports, will provide background for class discussions. A research paper and class presentation are required.

461 Senior Seminar: Environmental Biology Policy (also Agriculture and Life Sciences 661 and Biological Sciences 661)  Fall or spring. 3 credits. Prerequisite: permission of instructor. Sec, to be arranged. D. Pimentel. Focus on complex environmental problems, using a multidisciplinary approach. Task forces of twelve students, representing several disciplines, investigate significant energy—environmental policy.
problems. Each task force spends two semesters preparing a report for publication modeled after National Academy of Sciences' reports.

499 Honors Project Fall or spring; two-semester projects are acceptable. 3-5 credits each term with a maximum of 8 credits for entire project. Open only to biology and society honors students in their senior year. Staff.

China-Japan Program

140 Uris Hall

The China-Japan program includes faculty members who have a commitment to teaching and research on China and Japan. The program is interdisciplinary and is organized to encourage and assist students in the study of the two great civilizations of East Asia. In addition to offering a substantial number of courses in the languages of China and Japan, program faculty members cover most of the major disciplines by means of courses given in several departments. The program is especially rich in courses that deal with the history, literature, culture, art and of East Asia. Undergraduates who wish to concentrate their studies on China or Japan may do so by declaring a major in the Department of Asian Studies and selecting an advisor from the above-mentioned faculty members. Students interested in Chinese and Japanese studies should consult the Announcement of the Graduate School. For further information, students should contact the director or any staff member in the China-Japan Program Office, 140 Uris Hall.

College Scholar Program

Dean Lynne Abel, director, 55 Goldwin Smith Hall, 255-3386

The College Scholar program is described in the introductory section, p. 00.

397 Independent Study Fall or spring; 1-4 credits. Prerequisite: permission of program office.

499 Honors Research Fall or spring; 1-8 credits; a maximum of 8 credits may be earned for honors research. Prerequisite: permission of program director. Each participant must submit a brief proposal approved by the honors committee.

Freshman Seminar Program

Writing Program

201 Writing in the Humanities (also English 286) Fall or spring; 3 credits. Sections limited to 17 students. Prerequisite: completion of or current enrollment in another course in the humanities or expressive arts. Carries distribution credit as English 286. S-U grades with permission of instructor. This course helps students strengthen their reading and writing skills valuable in all disciplines and particularly appropriate to the humanities; it also encourages them to ask what they are doing when they read, interpret, and write about works of literature, philosophy, religious scripture, and the visual arts. Using such materials, the course takes up problems of technique in writing (audience, tone, voice, diction, style, method, use of secondary materials) and explores some of the larger questions to which they point: How does good critical and interpretive writing shape as well as find its audience? How does good critical and interpretive writing shape as well as find its audience? How does commentary change as we move from literature to philosophy, religious writing, art, and film? What counts as knowledge in these domains, and how is it formed by the media of its expression? What relevance to our study have historical data and theoretical speculation? Students in this course will pursue a group project over thirty pages (eight to ten papers) and confer often with the instructor.

Fall: M W F 11:15 or T R 10:10-11:25, S. Davis. Spring: hours to be arranged.

Writing done in the humanities makes a strong claim to understanding its material while commenting on it. The course begins with short works that provoke commentary by challenging our understanding and moves on to consider works that pit literary, philosophical, and historical understanding against its supposed antagonists: alien humanity, artistic inspiration, madness, the divine, and the will to power. Readings/viewings include Leonardo's Mona Lisa; Manet's Olympia, parables by Borges, Kafka, St. Matthew, and J. M. Coetzee; Mann's "Death in Venice"; Plato's Gorgias; Nietzsche's Birth of Tragedy; Euripides' The Bacchae; and Peter Weiss's Marat/Sade, the film and the play.

Fall: M W F 12:20, S. Goodhart. Spring: hours to be arranged.

A list of primary works will include Kafka's Metamorphosis, selections from Plato's Republic, Euripides' The Bacchae, Nietzsche's The Birth of Tragedy, Fragments of Theodicy (Leibniz, d'Alembert, Diderot, and Voltaire), the biblical story of the binding of Isaac, and Kurosawa's film Rashomon.

202 Writing in the Social Sciences (also Sociology 202) Fall or spring; 3 credits. Sections limited to 17 students. Prerequisite: one social science course. S-U grades with permission of instructor. This course helps students write and read with more confidence and skill, especially in the social sciences. The course investigates the ways in which social scientists use language. How and why does their writing vary? How do their theories, objectives, methods, and audiences affect their writing? We will address these questions through discussion and writing about works by social scientists in various fields. Both discussion and writing will aim to strengthen the composition skills that are important in academic work: analysis, comparison, and summary of texts; description and argument; handling of evidence, references, and quotations; and strategies for revision. Initial writing assignments will include several conferenced on finished essays and work in progress. Students will write, and often revise, eight to ten papers—about thirty pages of finished work.

Fall: M W F 11:15, S. Siskin. Spring: hours to be arranged.

Readings will range from organizational behavior, politics, and policy studies to sociology, anthropology, and psychology. The choice of readings will depend on good student's expertise and interests. As a critical guide to the readings, we will use what social scientists themselves have said about writing in the social sciences. Thus, for example, we might read what sociologist C. Wright Mills has said about writing in the social sciences, and (6) the nature of Black psychology. W. Cross.

Fall. 4 credits.

Spring. 3 credits.

Africana Studies and Research Center

137 Afro-American Writing and Expression Fall. 4 credits. A. Graves.

Designed to promote clear and effective communication skills, using Black-oriented materials as models for writing assignments and oral discussions.

138 Reading and Writing from Classics in Afro-American Prose Spring. 3 credits. A. Graves.

This course introduces students to the classics of the Afro-American experience in nonfiction. Essay, biography, journalism, and other work from writers such as Frederick Douglass, W. E. B. DuBois, Langston Hughes, Zora Neale Hurston, Malcolm X, James Baldwin, and Alice Walker provide the materials from which students' writing and research skills are exercised.

171 Black Families and the Socialization of Black Children Fall. 4 credits. W. Cross.

Survey of key psychological dimensions of the Black experience covering such issues as (1) race and intelligence, (2) Black identity, (3) Black family structure, (4) Black English, (5) the Black middle class, and (6) the nature of Black psychology.


A course designed for freshmen and sophomores that will be devoted to the history of Black education and contemporary issues in Black education, such as the struggle for Black studies and the development of independent Black schools, and problems of public schools in Black communities.

203 History and Politics of Racism and Segregation Spring. 3 credits. C. Mbata.

A cross-cultural study in historical context of the evolution of racist thought and practice in southern Africa and North America.

204 History and Politics of Racism and Segregation Fall. 3 credits. C. Mbata.

A course will deal with the historical patterns of racism and segregation using southern Africa and North America as case histories. The study will be undertaken within a theoretical framework that broadly defines racism and segregation and their implications.

231 Black Political Thought Fall. 3 credits. J. Turner.

This course is an introductory course that will review and analyze the major theoretical and ideological formulations developed and espoused by African-Americans in the struggle for liberation. This semester we will focus specifically on the political philosophy and
historical significance of Malcolm X, and the work and movement of Marcus Garvey, as the prime movers of nationalism and pan-Africanism among Black people in this century. Such themes as slave resistance, nationalism, pan-Africanism, emigration, anti-imperialism, socialism and internal colonialism, and the political and social views of Black women will be discussed. Black political thought will be viewed in its development as a response to concrete conditions of oppression and expression.

290 The Sociology of the Black Experience
Fall. 3 credits. Required for all undergraduate students majoring at the Africana Center. J. Turner.
An introductory course to the sociology of the Black experience and to the field of Afro-American studies. The course surveys the early culture and development of Black people and their role in world civilization and concentrates on the cultural heritage and social experience of Black people in the United States.

Anthropology

121 Encounters with Other Cultures
Spring. 3 credits. B. Lambert.
A survey of writing by anthropologists and other travelers who have told of their experiences as participants in other societies and as interpreters of other cultures. Students discuss and write about ways of playing the outsider’s role and changes in the traveler’s own outlook. Some of the lectures deal with the cultural contexts of the readings and thereby provide an introduction to the materials of cultural anthropology.

Archaeology

See Freshman Seminar brochures.

Architecture

190 The Language of Architecture
Fall or spring. 3 credits. Staff.
An introduction to the issues and purposes in architecture. We will use language as the metaphor with which to discuss works of architecture both as formal objects and as carriers of meaning when seen in their cultural contexts. Contemporary and historical examples, including local buildings, will be examined to develop skills in visual analysis and in “reading the messages” in architectural design.

191 The Literature of Architecture
Fall or spring. 3 credits. Staff.
The literature of architecture, understood as the testimony of the architects themselves, is drawn on to examine major themes of twentieth-century architecture. Texts are presented according to rhetorical mode within a framework of thematic categories. For example, narrative, descriptive, and polemical readings address “the birth of the skycraper.” Three salient themes in modern architecture are explored: the impact of technology and revolution, the skycraper and dwelling as new types for new needs, and the aesthetic of modern architecture.

Asian Studies

104 Three Ways of Thought
Fall. 3 credits. Staff.
An introduction to Confucianism, Taoism, and Zen through reading and discussion of basic texts.

105 Feminine and Masculine Ideals in Japanese Literature Fall or spring. 3 credits. Staff.
In its long history, Japanese culture has developed a large number of role models—the aristocrat, poet-priest, warrior-entertainer, “salary man,” and “education mama”—and idealized them in its literature and art. Using these ideals as its subject matter, the course will give students practice in reading texts closely, analyzing ideas, and writing various types of papers. Through studying Japanese concepts of femininity and masculinity, students will not only explore a new culture, but will also gain new perspectives on their own culture.

Biology and Society

103 Writing as a Naturalist
Fall or spring. 3 credits. A. Boehm, C. Burgess.
This course is about the complex relation between human consciousness and culture and the natural world. We will read essays by sociologists, poets, economists, theologians, and environmentalists, as well as by authors of natural history. Students in the course will be encouraged to consider their own experience in the natural world from similarly various perspectives. Writing assignments will be based upon the reading and students’ own ideas and observations. The texts will include works by Annie Dillard, Wendell Berry, John May PASSMORE, Robert BLY, Farley MOWAT, and Christopher stone.

104 Ecosystems and Ego Systems
Spring. 3 credits. M. Gilliland.
When business interests, university research, and governmental regulations compete, how can we best answer questions of ethics? These questions arise when we consider agricultural land use, environmental quality, and genetic engineering. Underlying them are other, larger questions of purpose and perspective. Do human values conflict with nature’s values? How does the prism of culture influence the decisions we make? The seminar will emphasize critical reading and the writing of expository essays and reports. Texts will include writings by biologists, governmental agencies, historians of science, journalists, philosophers, poets, and theologians.

Classics

120 Latin Literature
Fall. 3 credits. C. Newlands.
By examining some of the great works of Roman literature, this class hopes to achieve an understanding of classical culture and its influence upon the modern world. Emphasis on close reading of individual texts and on sharply focused writing assignments.

121 Classical Archaeology
Fall or spring. 3 credits. Staff.
Fall: Y Arnold; spring: S. Hatherly.
Archaeological research illuminates both the great achievements and the daily lives of the ancient Greeks and Romans. This course considers the methods, history, and results of archaeological research through the examination of a number of specific topics, which vary somewhat from year to year. Such topics may include the Minoan and Mycenaean civilizations; archaeology and Homer; Greek and Roman architecture, sculpture, and painting; and burial practices in various periods.

150 Greek and Roman Myths
Fall or spring. 3 credits. Staff.
An introductory course for students interested in acquiring a basic background in Greek and Roman myths and legends as they occur in ancient literature and art. Students will pursue various theories and improve their grasp of mythical motifs in later European and American literature. The primary purpose, however, will be to acquaint the student with the stories themselves.

Comparative Literature

102 Tales of Mystery, Quest, and Self-Discovery
Fall or spring. 3 credits. Staff.
On the premise that storytelling always begins with an appeal to the reader’s curiosity, this course deals with three kinds of mystery and discovery: psychological fiction (how does a writer involve the reader in a character’s discovery of his or her own nature?); detective stories (how does the writer tease or satisfy our curiosity about hidden events?); and allegorical narrative (how can a writer’s creation of fantastic or terrifying worlds lead the reader to new perceptions about his or her own world?). Student essays critically analyze the reading, which often includes science fiction, horror, and post-apocalyptic but which may range across drama, poetry, and philosophy and incorporate popular culture as well as recognized literary classics.

103 Inner Worlds, Outer Worlds, Other Worlds
Fall or spring. 3 credits. K. Shea and staff.
A consideration of different literary "worlds," from the realistic to the romantic, grotesque, and fantastic. In examining the writer’s creation of familiar reality, we will ask what our perceptions and ideas about the world have to do with the way things are. Readings drawn from authors such as Hoffmann, Ibsen, Kafka, Beckett, Yeats, and others exemplify a variety of literary forms—e.g., fiction, drama, and poetry—and provide the basis for students’ critical essays.

114 Multiple Voices: Self-Discovery through Literature
Fall. 3 credits. J. Monroe.
This course focuses on voices of the self in literature, various relations between writers and readers, problems of interpretation, and the contributions fictional narrative can make to our continual process of self-discovery. We will examine especially the ways in which language shapes our views of ourselves and the world around us. Readings include works by Thoreau, Goethe, Balzac, Morgan, and Barthes.

117 The Styling of Thought
Fall or spring. 3 credits.
D. Polkoff.
Good writing and good reasoning both require an intimate involvement with language, and language only happens within the frame of given contexts. This course aims to develop students’ powers of writing and reasoning by staging an encounter with the language of poetry and literary criticism. In reading poems by poets such as Whitman, Williams, Eliot, and Ginsberg, and essays by both older and newer critics, we engage an ordered series of stylistic issues basic to all forms of composition (theme, voice, figure, etc.) as we debate some of the intriguing problems posed by contemporary literary theory.

118 Literature and Morality
Fall or spring. 3 credits. S. Ramsey.
When you become absorbed in a romance of lust and seduction, are your morals being corrupted? Do television and advertising hypnotize and brainwash us? Can politicians and policymakers enlighten us, or do they distort our notions of right and wrong? Do poets and mythmakers serve any purpose besides flattering and exploiting public misconceptions? These questions will enter into a discussion of morality in literature, and that discussion will serve as the basis for students’ writing and as an indication of moral debate. Works by Plato, Euripides, Boccaccio, Shakespeare, Molière, Sade, Shelley, Flaubert, Tolstoy, and Brecht and from popular culture and the mass media.

130 World Classics to 1700
Fall or spring. 3 credits. M. Williams and staff.
Courses wordly regarded as vital to our understanding of Western culture. If vital, then lively; also, perhaps, answering some need. What is this liveliness, what is this necessity? This course explores a few (ordinarily, no more than three) main works in the Western literary tradition. The choice of texts will vary; the terms of inquiry will depend upon the major motives of the chosen texts.
We will study narratives of lives (or parts of lives) from a variety of different genres and periods, from psychoanalytic case history, biography, autobiography, fictional film, and narrative produced by the students in the class. We will study the formal features of these narratives (how do narratives differ from interpretations, descriptions, analyses, etc.) and we will discuss the appropriateness of the narrative form to an account of a life. Are lives shaped like stories, with plots, climaxes, characters, and clear chains of causes and effects, or do we distort the details of our lives when we view them as narratives? Does our familiarity with the shape of stories persuade us to understand our lives as narrative, or does the shape of a life provide us with the model for stories? Students will write expository and analytical essays, several short exercises in narrative form, and one longer narrative. Texts will include fiction by Henry James, Virginia Woolf, and Eudora Welty, case histories by Sigmund Freud, The Autobiography of Benjamin Franklin, and the films Citizen Kane and It's a Wonderful Life.

17 Shakespeare and Politics

Fall or spring. 3 credits.

Staff.

The six plays to be discussed will be chosen from among Richard II, Henry IV, Henry V, As You Like It, Measure for Measure, Antony and Cleopatra, Coriolanus, and The Tempest. While considering them as works of art, we notice certain recurring topics or themes: sources of political power and of human rights, concepts of civility, conflicts of loyalty (love vs. honor, individuals vs. institutions), and various ideas of order and rebellion. Students will write seven or eight expository essays, amounting to about thirty pages (including some revision), on questions raised by our study of the plays. Emphasis falls equally on reading and writing.

133 The Essays and Its Resources

Fall or spring. 3 credits.

S. Davis and staff.

Good college essays combine original thought and expression with informed and critical use of source materials—how? This course offers practical answers to this question, helping students marshal their resources for writing several kinds of papers required in college courses: argumentative essays, summaries and critiques of published material, and syntheses of the results of their research. Students in the course read extensively on a series of topics that span several disciplines—topics like the nature of authority, women in folklore, censorship in the media, and the politics of science—and write eight to ten essays and one short research paper, reviewing each other's written work in class and meeting frequently with instructors for individual conferences.

135 Writing from Experience

Fall, spring, or summer. 3 credits.

Staff.

Designed to give each student an opportunity to write about his or her own experience in an interesting way.

136 The Practice of Prose

Fall or spring. 3 credits.

Staff.

To write well, we must revise well. Revision, however, is a matter not just of tiding up commas but of re-seeing concepts and constructions. What happens when two writers looking over the same draft when one writer examines the same subject twice? What students learn from answering these questions will help them both with their college writing tasks and with writing in many contexts. Does the shape of the early and final versions of a speech (Martin Luther King, Jr.'s "I Have a Dream"), or a medical-journal article and a reflective essay on dying (James Fries's "Aging, Natural Death, and the Compression of Morbidity") and Lewis Thomas's "The Long Habit"? Short weekly writing assignments enable students to consider, and practice, re-vision in their own work.

141 The Bible and Ancient Authors

Fall or spring. 3 credits.

Staff.

Writing about, reading, and discussing selected books of the Bible (considered primarily as literature) and classical texts such as The Odyssey and Sophocles' Oedipus Rex.

157 American Literature and Culture

Fall or summer. 3 credits.

M. Colacurcio.

The persistence of Puritan themes in America's first literary classics. Why has the "guilty identity" proved so durable? What others have been imagined? With what conviction? Writers include Franklin, Hawthorne, Thoreau, Melville, Dickinson, and James.

158 American Literature and Culture

Spring or summer. 3 credits.

Staff.

The literary expression of American identity, 1870-1930. We will explore the changing confrontations between Americans and Europeans, between black and white Americans, and between men and women. Readings may include James (short fiction), Twain (Huckleberry Finn), Dreiser (Sister Carrie), Hemingway (The Sun Also Rises), and Faulkner (Go Down Moses).

165 Fantasy

Fall, spring, or summer. 3 credits.

Staff.

A course in reading, analyzing, and writing about several of the kinds of stories usually classified as "fantastic": fairy tales, horror stories, science fiction, utopian fiction, dream-vision. Readings will be by such authors as Carroll, Poe, Mary Shelley, Stoker, Kafka, Calvino, and Le Guin.

187 Autobiography: Theory and Practice

Spring. 3 credits.

H. Gates.

Students explicate canonical autobiographies as models of rhetoric to be imitated in weekly writing assignments. Students are required to keep a journal and to participate in workshops, whose assignments include autobiographies by Augustine, Rousseau, Douglass, Sartre, Nabokov, Hurston, and others.

270 The Reading of Fiction

Fall, spring, or summer. 3 credits.

Staff.

Forms of modern fiction, with emphasis on the short story and novella. Critical studies of works by English, American, and continental writers from 1880 to the present—Bellow, Chekhov, Conrad, Faulkner, Mann, Kafka, Joyce, and others. Students will write several short critical essays totaling approximately thirty pages.

This course is open to sophomores and to freshmen who have taken a Freshman Seminar or who have three English A.P. credits. It may be used to satisfy either the humanities distribution requirement or the Freshman Seminar requirement, but not both. Recommended for English majors.

271 The Reading of Poetry

Fall or spring. 3 credits.

Staff.

Designed to sharpen the student's powers to understand and respond to poetry. Readings in the major periods, modes, and genres of poetry written in English. Students will write several short critical essays totaling approximately thirty pages. This course is open to sophomores, and to freshmen who have taken a Freshman Seminar or who have three English A.P. credits. It may be used to satisfy either the humanities requirement or the Freshman Seminar requirement, but not both. Recommended for English majors.

272 An Introduction to Drama

Fall or spring. 3 credits.

Staff.

A study of selected masterworks by such playwrights as Sophocles, Ibsen, and Shaw to introduce the student to the chief idioms and styles of the Western dramatic tradition. The work will consist of discussions and papers as well as a special production of a play being produced by the Department of Theatre Arts. The course is open to sophomores, and to freshmen who have taken a Freshman Seminar or who have three...
English A.P. credits. It may be used to satisfy either the humanities requirement or the Freshman Seminar requirement, but not both. Recommended for English majors.

English for Later Bilinguals
215 English for Later Bilinguals (also Modern Languages and Linguistics 215) Fall or summer. 3 credits. (Note: This course is not suitable for students whose schooling has been entirely in English-medium schools.) Register with Marilyn Martin in 323-B Morrill Hall on Tuesday, August 26, from 10–noon or 2–4 p.m. M. Martin. Designed to strengthen the English-language skills of students from other countries who entered the American high school system during the teen years and whose language in the home is not English. Intensive work in written English is offered, with emphasis on sentence structure, cohesion, vocabulary expansion, grammatical structure, organization, and maturity of style.

216 English for Later Bilinguals (also Modern Languages and Linguistics 216) Spring. 3 credits. Prerequisite: English 215. (Note: This course is not suitable for students whose schooling has been entirely in English-medium schools.) Register with Marilyn Martin in 323-B Morrill Hall. 3 credits. M. Martin. Designed to improve the writing skills of students from non-English-speaking countries who have attended U.S. high schools for one to four years. Seeks to improve vocabulary, sentence, and paragraph structure and organization of compositions. The major component of this course is a research paper—a project that helps develop skills in library resource use, note taking, paraphrasing, summarizing, and following the conventions of formal paper writing.

French Literature
105 The French Novel (also Romance Studies 105) Fall. 3 credits. A. Colby. Evolution of the French novel from the seventeenth century to the present. Discussion of novels by such writers as Madame de Lafayette, Laclos, Stendahl, Flaubert, Maupassant, Sarraute, and Bobbe-Grillet (readings in English translation).

109 Techniques of Interpretation: An Introduction to Semiotics (also Romance Studies 109) Fall or spring. 3 credits. Staff. In its broadest meaning, semiotics is the study of signs that carry information: roadside signs, fashions, advertisements, publicity posters, and literary modes. This course, which does not presuppose prior technical knowledge, will introduce students to a critical reading of signs: the signifier (the concrete expression of the sign) and the signified (the message) and their various interactions. Readings will include R. Barthes's Mythologies or T. Hawkes's Structuralism and Semiotics. Exercises will be essays on how to analyze various signs taken from practical experience, such as advertisements from magazines or television, or from cultural phenomena, such as fashion codes or artistic modes.

German literature
109 Folk Tales and Folk Poetry Fall or spring. 3 credits. I. Ezergailis and staff. Discussion and analysis of various types of folk literature from primitive legends, myths, and ballads to contemporary literary tales. Aims to develop reading skills that can be redirected to the student's own expository writings. Readings (in English translation) range from Grimm's fairy tales to stories by J. R. R. Tolkien.

105 Kafka, Hesse, Brecht, and Mann Fall or spring. 3 credits. Staff. This course will be based on complete works (in English translation) by four representative German authors of the first half of the century. Although dealing with works of great popular appeal (Dostoevsky, Siddhartha, Death in Venice, The Metamorphosis, Mother Courage, Galileo, and others), the emphasis of the course will be on improving writing skills. We will meet twice a week for lectures and discussion. In lieu of a third class meeting there will be regular conferences between students and their instructors to discuss the papers.

211 Intensive Workshop in Germanic Studies for Freshmen I Fall. 6 credits. Intended for entering freshmen with extensive training in the German language (CPT achievement score of 650 or comparable evidence; consult instructor). Taught in German. Satisfies the language and distribution requirements or the Freshman Seminar requirement but not both.

H. Deinert. Not intended as a survey but rather a rigorous seminar designed to familiarize students with literary forms and the tools of critical analysis. The course will provide an intensive introduction to the study of German literature through the discussion of exemplary prose works and poems from the eighteenth century to the present.

312 Intensive Workshop in Germanic Studies for Freshmen II Spring. 4 credits. Designed primarily as a sequel to German Literature 211. Taught in German. Satisfies the language and distribution requirements or the Freshman Seminar requirement but not both.

H. Deinert. Emphasis is on German literature since 1900 (T. Mann, Hesse, Kafka, Brecht, Duerrenmatt, Peter, Weiss, Plenzdorf, Rilke, Benn, Celan). Supplementary reading from contemporary philosophy, psychology, sociology, and political theory.

Politics
100 Power and Politics Fall or spring. 3 credits. Staff. Selected topics analyzing current and vital issues in the public arena. Some seminars will emphasize national themes, and others will deal with international concerns. Occasionally seminars will be offered that investigate power and politics from a historical or philosophical perspective.

100.1 Politics and Ideology in Europe Fall or spring. 3 credits. P. Johnson. A rich array of political ideologies have emerged out of Europe's great cultural and social diversity. Quite foreign to the North American context, these have been associated with Germany's liberal Weimar Republic, the Nazi movement, the Paris student uprising in May 1968, the rise of the Green Party, Christian Democracy, and the Leninist revolutionary parties. This course is designed to give the student an overview of some of the developments that have given twentieth-century European politics its distinctive character. The task of the course will be to explore the relation between politics, political ideas, and intellectuals.

100.2 The American Government and National Security—The Politics of Militarization and the Militarization of Politics Fall or spring. 3 credits. D. Wills. A large permanent military establishment is a recent development in American history. Deliberate governmental policies created this establishment during the years following World War II. In turn, these institutions and interests have greatly affected the nature of public policy and government. This seminar will examine the growth and evolution of the politics of national security. In particular, the course will focus on the contemporary competition among the peace movement, the new cold-war coalition, and the military reform movement for control over defense policy. Readings will include historical perspectives such as Franz Schuman's The Logic of World Power, and arguments from all sides of the contemporary debate, including James Fallows's National Defense.

100.3 Morality and Freedom of Speech—The Pornography Debate Fall or spring. 3 credits. M. Caputi. We will examine the various issues surrounding the pornography debate. We will ask ourselves questions such as these: Is pornography a moral issue? Should it be banned? How does it relate to larger feminist issues, and does it make feminism appear reactionary? Should the government endeavor to protect children from pornography? Consideration will be given to arguments both in favor of and against pornography, with special attention given to feminist authors. Among these are Andrea Dworkin, Ellen Willis, Susan Griffin, Susan Brownmiller, and Germaine Greer. Students will be asked to write a number of short papers addressing these and other questions.

100.4 Myth and Reason in American Politics Fall or spring. 3 credits. M. Harvey. The course will begin with a reading of Plato and MacCormack on the use of myth in legal institutions and the founding and maintenance of states and then apply their ideas to a study of important episodes in American political history, notably the founding, the Civil War, the First World War, the Kennedy years, and the Reagan years. The course will concentrate on the political writings and speeches of presidents and other statesmen, though we will also study writers such as Paine and Whitman. The course will endeavor to impart not only a recognition of the strength and utility of myths in American politics, but also an ability to recognize and criticize the rhetoric of political writings.

100.5 The Politics of Nonviolent Resistance Fall or spring. 3 credits. S. Zunes. This seminar will review the history, theoretical bases, and strengths and weaknesses of nonviolence as a political strategy. We will examine the advantages and disadvantages to methods of armed resistance. Analyses will be included from both pacifist and pragmatic advocates of nonviolence as well as those with both reformist and revolutionary programs. Case studies will be included from the United States, Europe, and the Third World.

100.6 The Politics of Poverty Fall or spring. 3 credits. L. Daugaard. The way in which societies decide to treat or "manage" problems of poverty and need may reveal a great deal about their fundamental values and political principles. The modern Western welfare state is one of many solutions to the perennial problem of state responsibility to the poor and to other social groups. This seminar will examine such questions as: What is the definition of poverty? Is it the result of laziness or sloth, or is it the product of impersonal social forces? What factors determine whether societies— from small communities in the early Christian era to the contemporary welfare state—ignore, criminalize, support, or subsidize their poorer classes?

107 Literature and Politics Spring. 3 credits. B. Anderson. The course involves consideration of the ways in which various literary forms shape and reflect conceptions of politics in different eras and cultures. Readings cover selected Western classics, ancient and modern, as well as texts from non-Western civilizations.

108 Jews and Palestinians—Can They Coexist in Peace? Spring. 3 credits. M. Esman. Since the emergence of modern Zionism nearly a century ago, two nationalist movements have contended for control of the same territory. Each side asserts historical claims that exclude the other. These
conflicting claims have generated intense hatred and continuous bloodshed that have defied all efforts at settlement and seem likely further to escalate. This course will review the origins and trace the evolution of the conflict between Zionism and Palestinian nationalism. It will review recent efforts to achieve a peaceful resolution and ask whether there are other practical approaches that might be attempted.

100.9 Arms Control: Past, Present, and Future Spring. 3 credits. J. Peppy.
This course will look at the concept of arms control (in contrast to disarmament) in the twentieth century. It will trace the evolution of arms control agreements to which the United States has been a party, with emphasis on the structure of the agreements and the political context in which they were negotiated. Weekly reading assignments will provide the factual basis for the required short papers.

History

This course will examine the theory and reality of the English criminal justice system in the eighteenth and early nineteenth centuries. This period was one of great change in attitudes towards the practice of criminal law, policing, and criminal punishments. Topics will include the basis of law and its reform, the origins of professional policing, the dilemma of capital punishment, political protest, and the eighteenth-century criminal underworld. Readings will include texts of political theory, such as John Locke's Second Treatise on Government and John Stuart Mill's On Liberty, contemporary literature like John Gay's Beggar's Opera and Henry Fielding's Jonathan Wild, as well as modern historians of crime and law. Writing assignments will be based primarily on the readings, and there will be opportunity for in-class discussion of the texts also.

205 The Growth of Political Democracy in the United States Spring. 3 credits. J. Silbey.
An examination of the democratization of American political life since the American Revolution. Such topics as the expansion of white, black, and women's suffrage and the changing concepts of participation and leadership in American politics will be explored. A number of books and documents covering the topic will be read and discussed and several short papers written.

History of Art

103 Visual Analysis Fall or spring. 3 credits. N. Prendergast and staff.
The nature of man-made objects, from tools to cities, including such conventional categories as painting, sculpture, and architecture, is examined. Students are introduced to the problems of perceiving such objects and articulating the visual experience. The course is organized by media and themes rather than by chronology, and it is a supplement, not a prerequisite, to art history.

104 How to Look at Works of Art Fall or spring. 3 credits. N. Prendergast and staff.
Several major works of art, primarily paintings, are examined in detail. The cultural and historical contexts in which the works were created and their unique qualities as works of art are considered.

Hotel Administration

For a full description of the following course see the School of Hotel Administration, "Communication Courses."

165 Introduction to Writing for Business Fall or spring. 3 credits. Each section limited to 20 students. D. A. Jameson and staff.

Linguistics

114 Hispanic Bilingualism Spring. 3 credits. I. Almorall-Padamarse.
After an initial review of the key concepts in a study of languages in contact, we emphasize specific aspects of Hispanic bilingualism in the United States—its sources, nature, and implications. Code switching versus Spanglish, interference with respect to the Mexican-American and New-York-Puerto Rican Spanish and English, and language dominance are among the topics discussed. Reading assignments drawn from the fields of sociolinguistics and bilingualism-biculturalism. Writing assignments, varying in length, respond to the student needs and interest.

Medieval Studies

101 The Literary Adventure of the Middle Ages Fall or spring. 3 credits. Staff.
The legendary figures and fantastic worlds of medieval literature have enchanted audiences throughout the world. This course will explore the writings of the heroic and courtyard ages, investigating such themes as the nature of the epic hero and his society (Beowulf, Icelandic sagas, the Niebelungenlied), the development of the courtly hero and love (Arthurian romances), and the sophisticated treatment of the human comedy (Sir Gawain and the Green Knight or Chaucer's Canterbury Tales). A "medieval" work by a modern author (J. R. R. Tolkien, C. S. Lewis, or John Gardner) will also be included.

102 King Arthur and His Knights Fall, spring, or summer. 3 credits. Staff.
King Arthur and the knights of the round table inspired the best-selling literature of medieval Europe and remain a popular subject today. This course explores the Arthurian legend in medieval literature and at least one modern work (usually Mark Twain's Connecticut Yankee or a romance of T. H. White). Readings in English are chosen from the Laís de Marie de France, romances of Chrétien de Troyes, the quest for the Holy Grail (Parzival), the legend of Tristan and Isolde, Sir Gawain and the Green Knight, and Malory's Morte d'Arthur. Discussions will investigate fundamental problems raised by these stories: the individual in society, the development of the hero, the nature of love, and the problem of religious ideals in a secular world.

103 Fantasy and Fiction, Medieval and Modern Fall or spring. 3 credits. Staff.
We attempt to determine what fascinates the modern imagination about the Middle Ages and whether any continuity exists between medieval and modern works. The course opens with a survey of medieval fantasy selected from varied cultures, e.g., Grettir's Saga, The Voyage of Saint Brendan, Beowulf, Bernard Silvestris's Cosmographia, Laís of Marie de France, Arthurian romances, or Dante's Inferno. The second half of the course examines the relationship of such works to modern science fiction and fantasy with a "medieval" setting, such as J. R. R. Tolkien's The Hobbit, Italo Calvino's The Castle of Crossed Destinies, Mark Twain's Connecticut Yankee, Walter Miller's Canticle for Leibowitz, or works by Ursula Le Guin and Poul Anderson.

Modern Languages and Linguistics

See "English for Later Bilinguals" and "Linguistics."

Music

111 Sound, Sense, and Ideas Fall or spring. 3 credits. M W F Staff.
Music is in pursuit of answers to this question, we touch upon a broad range of issues: the relation of man's music to noise and to the "musical" sounds of nature, the functions of music in society, the portrayal of the emotional and intellectual in our responses to music, and the problems posed by the combination of words and music. Because these issues concern all types of music, any musical style may be relevant. Reading, listening, and writing assignments aim students toward the goals of straight thinking and strong writing. No previous musical instruction is necessary.

Near Eastern Studies

115 Literature and Politics in the Middle East Fall. 3 credits. S. Mehrez.
For the past century or so, the Middle East has provided an almost uninterrupted scene of political and ideological struggle. Revolution, nationalism, war, socialism, radicalism, and fundamentalism have all been part and parcel of the modern history of the Middle East. Where does literature fit into this picture? What is the role of the intellectual in a part of the world where writers cannot afford to "sit back and poke sophisticated irony at one another" or "explore the anguished world of lonely individuals abstracted from society by individual circumstances." Through readings of Middle Eastern literary texts we will explore how writers have participated, and continue to participate, not so much in "the writing of" but rather in "the making of" history. The emphasis of the course is on improving reading and writing skills. Students will be assigned a number of short papers at first, then longer essays towards the second half of the semester.

125 Society, Economy, and Religion in Ancient Israel: King David's Jerusalem (also Near Eastern Studies 126) Fall or spring. 3 credits. D. Deuel.
An investigation of daily life as it was experienced during the Davidic monarchy. We will make use of the contributions of archaeology as well as texts from the Old Testament. Topics include occupations, institutions, contemporary literary, and various other domestic, and administrative features of Israelite society.

Philosophy

For descriptions of other philosophy seminars, consult Freshman Seminar Program publications. Past topics have included concepts of justice, economic justice, science and pseudoscience, the nature and existence of God, theories of the mind, objectivity and reality in scientific theorizing, and others.

100.2 The Mind's I Fall. 3 credits. C. Ginet.
The seminar will read and discuss material in The Mind's I: Fantasies and Reflections on Self and Soul, compiled and arranged by Douglas Hofstadter and Daniel Dennett. From the preface: "What is the mind? Who am I? Can mere matter think or feel? Where is the mind located? Can we explain behavior in terms of the mind in the same way that we can explain it in terms of the body? What is the relationship between mind and brain? Is mind reducible to brain? Is it possible to simulate mind?" The problems addressed in this seminar are at present no easy answers to the big questions, and it will take radical rethinking of the issues before people can be expected to reach a consensus about the meaning of the word '1'. This book, then, is designed to provoke, disturb, and befuddle its readers, to make the obvious strange, and perhaps, to make the strange obvious."

100.5 Knowledge and Mind Fall. 3 credits. S. Shoemaker.
The course will deal with central philosophical issues concerning the nature of our knowledge of the world and the nature of our minds. Questions considered will
include: “What is knowledge?” “Can we have knowledge of the existence of God?” “What is the relation of mind to body?” “How do we have knowledge of other people’s minds?” “How do we have knowledge of our own minds?” and “Can machines think?” Readings will be from both classical philosophers—we will be with Descartes’ Meditations—and contemporary sources.

100.6 Vices and Virtues Fall. 3 credits.
N. Kretzmann
Are you a good person? If you’ve ever uncertain about the answer, then you don’t think that that’s just another way of asking whether you approve of yourself. Instead, you think that there are objective grounds on which to decide about the goodness or badness of persons. But what are they? Could it be that your goodness or badness as a person is settled by the opinion of the people who know you best, or by God’s view of you? Is your goodness or badness perhaps simply a function of the ratio of your morally right actions to your morally wrong actions? Or are there identifiable features of you yourself that make you a good or a bad person? If so, what would they be like? Are you born with them, or can you acquire them? In this seminar we will answer those questions, exploring morality primarily from the consideration of the goodness or badness of persons rather than the rightness or wrongness of actions. We will begin by reading authors from all periods of the history of thought (including several contemporary authors) in order to understand the notion of vices and virtues and to get some idea of each of the more important types. Our readings and discussions will culminate in a close study of one particular theory of the virtues and vices—Thomas Aquinas’s.

Romance Studies

105 The French Novel Fall. 3 credits. (See also French Literature 105.) A. Colby-Hall.

109 Techniques of Interpretation: An Introduction to Semiotics Fall or spring. 3 credits. (See also French Literature 109.) Staff.

Russian Literature

103 Classics of Russian Thought and Literature Fall or spring. 3 credits.
Staff.
Russian society has always seen its literature as having a mission important to the development of the nation. We will examine Russian literature as it participates in the debate, whither Russia? We will look in particular at the conflict between the Slavophiles, those who thought Russian had its own unique destiny, and the westernizers, those who thought Russian should look to the West for a model in its development. We will be reading such Russian authors as Turgeniev, Dostoevsky, Herzen, and Solzhenitsyn in English translation. The course will examine the rhetorical means each author uses to make his argument.

104 Nineteenth-Century Russian Literary Masterpieces Fall or spring. 3 credits. P. Carden and staff.
This course will introduce students to a broad selection of the major works of the Russian literary tradition. Our emphasis will be on what makes each work interesting as writing, what themes have been particularly interesting to Russians, and how we recognize the distinctive voice of each of the writers we are studying. Among the authors read are Pushkin, Gogol, Turgeniev, Dostoevsky, Tolstoy, and Chekhov. All reading is in English translation.

105 Twentieth-Century Russian Literary Masterpieces Fall or spring. 3 credits.
Staff.
Russian literature in the twentieth century has endured many ups and downs. At times it has produced great masterpieces of modern art. At times it has been forced into the dry mode of “socialist realism,” in which it had to voice the ideas forced upon it by a totalitarian government. Russian authors have been glorified as the voice of the nation, and they have also perished in concentration camps in the far north of Siberia. We will read a representative selection of these authors, including those who took the path of art, those who bent to the “social command,” and those who assumed a politically dissident stance. Among the authors read will be Babel, Pasternak, Olesha, and Solzhenitsyn. All reading is in English translation.

107 Writers on Writing Fall or spring. 3 credits. P. Sultzman.
Why do we write or read? The centrality of reading and writing in Russian society evidences our dependence on language. Both processes paradoxically mirror and create reality. We will examine how writers of nineteenth- and twentieth-century Russian literature from Gogol to Dostoevsky portray reading or writing processes in their works, and, with the help of selections from Schiller, Poulet, Sartre, and others, we will analyze how and why we read and write.

Society for the Humanities

101 Science as Literature: The Profession of Science Fall. 3 credits.
J. Lumley
Robert Ornstein claims that science turns the impossible into the boring. Einstein contends that science, in its purest form, uncoovers “the grandeur of reason incarnate in existence.” In readings ranging from Darwin to Einstein to Asimov, we shall try to discover how a discipline can be so variously defined and described.

102 Science as Literature: The Impact of Science on Self Image Spring. 3 credits.
J. Lumley
Man’s rational perception of his place in nature frequently clashes with his emotional need to elevate himself above nature. In the last 350 years, science has had the uncomfortable habit of dethroning him as master of the universe. With readings from Girtin, Darwin, Freud, and others, we shall follow man’s journey from a position of dominance in a geocentric, divinely ordered universe to that of a genetically programmed organism in a decaying biosystem. We shall examine how well, or how completely, he has accommodated his dreams to the new worlds born of science.

Sociology

100.5 Work Life and Change in America Fall or spring. 3 credits.
K. Westby
Work is an all-pervading phenomenon in our lives. We argue about it, we worry about it, we fight for it. What is it about occupations that dominates our lives? How have technology and world competition affected the workplace and work force in terms of our postindustrial society? We will look at various occupations in order to understand how and why people value their work. Do values affect work attitudes, or does the actual work affect values? In response to dehumanizing aspects of industrialization, we will also analyze alternative work styles, such as worker-owned firms. Biweekly writing assignments.

100.6 Ethnicity and Bilingualism Fall. 3 credits.
E. Acevedo
Emphasis on training students in the proper writing styles, such as worker-owned firms. Biweekly writing assignments.

100.7 Hard Choices Spring or summer. 3 credits.
S. Siskin.

100.10 Sociology of Latin America Fall. 3 credits.
E. Polakoff.
This is an interdisciplinary course that integrates historical, anthropological, economic, sociological, and literary analysis on Latin America. Readings reflect a diversity of writing styles, demonstrate the breadth of sociological thought and analysis, and emphasize the relevance and importance of other disciplines to sociology. The major criterion used in the selection of readings was the success of the authors in formulating a significant problem to study and analyze, their ability to capture the essence of that problem and present it within the medium and social environment of their work to a greater understanding of social life and social processes. The primary objective of the course is to teach students to write not just “good” sociology, but sociology that takes on a life of its own, that is, sociology that endures changes in the problems selected for investigation and analysis and changes in the way we think about social problems.

100.12 Portraits of Status, Power, and Sex Fall. 3 credits.
S. Siskin.
Many portraits are not simple records of appearances, but pictures of social status, power, or sex that aim to flatter, criticize, or titillate. We will learn to recognize portraits like those in painting and drawing, social science, poetry and fiction, and advertising and will examine relations between the medium and social environment in which they have been created. Spanning six centuries, the portraits will range from Chaucer’s Wife of Bath to ads in Playboy and Vogue. Our focus will be on portrayals of women and the upper classes in England, France, and America.

Spanish Literature

109 Revolution and Literature in Latin America Fall or spring. 3 credits.
Staff.
Two major revolutions in the Western Hemisphere this century—the Mexican revolution of 1910 and the Cuban revolution of 1959—will serve as models for understanding present conflict in Central America. We will examine readings in the Latin American “literature of the revolution” and will consider historical, political, institutional, and individual, as well as literary, concerns. Readings (in English translation) will include, but not be limited to, narrative fiction by Carlos Fuentes and Gabriel Garcia Marquez, poetry by Pablo Neruda, essays by Octavio Paz and Ernesto (“Che”) Guevara, and a speech by Fidel Castro. Some work by lesser-known authors, such as Mariano Azuela and Manilio Argueta, will also be treated. The class will also meet twice weekly for analysis and discussion of student writing and student reading, although individual conferences will replace a common session several times during the semester.

Theatre Arts

130 American Myth in Drama Fall or spring. 3 credits.
Staff.
This course examines the images of America presented on the twentieth-century stage. How do Americans view the themselves? How are they seen by foreign dramatists? How to what ends do dramatists use the American myth?

140 From Script to Stage: Writing about the Theatrical Process Fall or spring. 3 credits.
Staff.
Students will explore and write about the process through which drama becomes theatre: how the methods of playwright, director, actor, and designer dovetail to create the theatrical piece. Students will be asked to apply the rhetorical strategies of theatre to their own essay writing. Texts will include Theatre Cornell productions.
Women’s Studies

106–107 Women and Writing (also English 105–106) Fall or spring. 3 credits.
Fall: L. Brown and staff; spring: M. Jacobus and staff.

Perceptions of “Womanhood”: Western Europe and the Middle East Fall. 3 credits.
N. Karwan

We will examine how modernizing societies have come to define, restrict, or control “womanhood.” Readings in English, Will be selected from important scholarship and fiction about the problem of being woman both in late nineteenth-century France and Britain and in post-World War II Lebanon and Iran. By exploring societies of differing religious, political, and cultural heritages, and by means of careful and critical evaluation of the literature, its terminology, and categories of analysis, it is hoped that students will develop a grasp of common problems and preoccupations and begin to question the more obvious, even stereotypical, contrast.

Writing

137–138 Workshops in English Composition 137, fall or summer; 138, spring. 3 credits each term. S-U grades only.
Hours to be arranged. N. Kaplan, M. Gilliland.
K. Hjortshoj, J. Martin, D. Williams

Designed for students who have had little or no training in composition and for those who are experiencing serious difficulties with their writing assignments in other courses. Instruction takes place in small, intensive group sessions and in individual conferences. All students receiving a grade of S will be granted credit toward graduation. Students whose writing displays sufficient competence will also be granted Freshman Seminar credit. Students who feel they may need this kind of intensive work should attend a writing assessment session during orientation week or call 255-6349 to make an appointment with a member of the Writing Workshop staff.

Human Biology Program

J. Haas (nutritional sciences), director; N206 Martha Van Rensselaer Hall. 255-8001; R. Dyson-Hudson (anthropology), B. Edmonston (demography/epidemiology), B. Finlay (psychology), J. Fortune (physiology/women’s studies), R. Johnston (psychology), M. LaVelle (anthropology), D. Levitsky (nutritional sciences), R. Savin-Williams (human development and family studies)

Human Biology integrates the methods and theories of many disciplines, such as biological anthropology, nutrition, neurobiology, psychology, demography, ecology, genetics, and paleoanthropology, into a comprehensive study of biological diversity in Homo sapiens. A central focus of this interdisciplinary approach to the study of the human organism is an understanding of evolutionary processes that explain our biological variation through space and time. The program of study seeks to educate future biological scientists to address the concerns of a society that is becoming more demanding of the scientific community to place its specialized biological knowledge in a broad context. The human biology curriculum is of particular relevance to undergraduate students in premedical and preprofessional programs, biological anthropology, nutrition, human development, ecology and systematic, psychology, physiology, genetics, and the health-related sciences. It serves to bring together students with a common interest in humankind as defined from these diverse fields and to provide a forum for student-faculty interaction on various topics relating to the field of evolution and diversity. Human Biology is not a major but a curriculum of study that provides majors in various departments with a program for selecting elective courses that deal with the biology of the human species. Students in their junior year may develop a program of study in human biology while majoring in a number of different departmental fields.

Basic Requirements

The requirements for a program of study in human biology are designed to insure sufficient background in physical sciences and mathematics to enable the student to pursue a wide range of interests in the fields of modern biological sciences, anthropology, and fields related to the evolution and physical diversity of the human species. Adjustments may be made in these requirements, depending upon the student’s academic background and affiliation with colleges and schools within the University.

The basic requirements are one year of introductory biology (Biological Sciences 101–103 plus 102–104 or 105–106 or Biological Sciences 100 offered during the six-week Cornell Summer Session), one year of general chemistry (Chemistry 207–208 or 215–216 or 103–104), one year of college mathematics, including at least one semester of calculus (Mathematics 111–112 or 113–112 or 105–106 or 111–105 or 113–105); at least one semester of organic chemistry lectures (Chemistry 253 or 357–358 or 359–360); one course in genetics (Biological Sciences 281 or 282); one course in biochemistry (Biological Sciences 330 or 331); two semesters of physics (Physics 207–208 or 112–123–214 or 101–102). It is recommended that students planning graduate careers in biological anthropology, psychology, and related fields in the medical and nutritional sciences take a course in statistics. Students shall consult their faculty adviser in Human Biology for help in selecting appropriate courses.

Elective courses should be taken to enable the student to acquire breadth in the subject matter of human biology outside of their departmental major. Therefore only 6 of the 15 human biology elective credits may also fulfill requirements for the major. Courses shall be selected that also provide sufficient exposure to the integration of basic anatomical and physiological sciences with the behavior of individuals and groups within the context of evolutionary theory and ecology. The courses listed below are representative of the offerings in human biology and are included to assist the student in organizing a curriculum of study. They are organized into three groups that reflect the three levels of integration noted above: (1) human anatomy and physiology, (2) human behavior, and (3) human evolution and ecology. Students should choose at least one course from each of these areas of integration. It is anticipated that the student will include in a program of study at least one of the laboratory courses offered. It is expected that a student will take a minimum of 15 credits from among these courses or others that are listed in the brochure available to students upon request.

There is no foreign language requirement for Human Biology above that dictated by specific departments and colleges. The requirements for the human biology curriculum are set alongside requirements of the undergraduate majors as these are defined by different departments. Students with independent majors may design their own programs of study under the guidelines provided by their college. Although a student may indicate an interest in Human Biology in the freshman year and be able to obtain early guidance from a faculty adviser representing the curriculum of study, it is more usual for students to establish their course programs in the first semester of the junior year. The student may request one of the faculty advisers in Human Biology to be the principal adviser, or he or she may have an adviser in the department of the major and seek the advice of a Human Biology faculty adviser in matters pertaining to satisfaction of the requirements. In certain cases a faculty adviser may represent both the major and the curriculum of study in human biology.

Courses

Human Anatomy and Physiology
Bio S 214 The Biological Basis of Sex Differences (also Women’s Studies 214) Spring. 3 credits.

Bio S 274 The Vertebrates Spring. 5 credits.

Bio S 311 Introductory Animal Physiology, Lectures (also Veterinary Medicine 346) Fall. 3 credits.

Bio S 414 Vertebrate Morphology (also Veterinary Medicine 700) Spring. 3 credits.

Bio S 474 Laboratory and Field Methods in Human Biology Spring. 4 credits.

NS 115 Ecology of Human Nutrition and Food Fall or spring. 3 credits.

NS 222 Maternal and Child Nutrition Spring. 3 credits.

NS 331 Physiological and Biochemical Basis of Human Nutrition Spring. 3 credits.

NS 347 Human Growth and Development: Biological and Social Psychological Considerations (also Human Development and Family Studies 347) Spring. 3 credits.

NS 361 Biochemistry and Human Behavior (also Psychology 361) Fall. 3 credits.

NS 441 Nutrition and Disease Fall. 4 credits.

Psych 322 Hormones and Behavior (also Biological Sciences 322) Spring. 3 credits.

Psych 425 Brain and Behavior Fall. 3 or 4 credits.

Vet M 331 Medical Parasitology Fall. 2 credits.

Human Behavior

Anth 476 Human Nature: An Evolutionary Perspective Fall. 4 credits.

Bio S 301 Biology and Society I: The Biocultural Perspective (also Anthropology 301 and Biology and Society 301) Fall. 3 or 4 credits.

Bio S 427 Vertebrate Social Behavior Fall. 3 credits.

HDFS 212 Early Adolecence: A Biological Approach Fall. 3 credits.

HSS 315 Human Sexuality: A Biosocial Perspective Fall, spring, or summer. 3 credits.

NS 325 Sociocultural Aspects of Food and Nutrition Fall. 2 credits.

NS 347 Human Growth and Development: Biological and Social Psychological Considerations (also Human Development and Family Studies 347) Spring. 3 credits.

Psych 326 Evolution of Human Behavior Fall. 4 credits.

Psych 425 Brain and Behavior Fall. 3 or 4 credits.

Soc 430 Social Demography Spring. 4 credits.

Human Evolution and Ecology

Anth 101 Introduction to Anthropology: Biological and Prehistoric Perspective Fall. 3 credits.
purse university-level studies in the United States, as well as for visitors, businessmen, and others seeking competence in the language. The intensive nature of the program leads to a command of the language in all its aspects—listening, speaking, reading, and writing—in the shortest possible time. Integrated courses are offered both fall and spring semesters at three levels: beginning (Test of English as a Foreign Language [TOEFL] score below 370), intermediate (TOEFL score below 450), and advanced. Students who have gained full admission to, or who already are registered in, degree-granting programs at Cornell should consult the section “Modern Languages, Literatures, and Linguistics” for information regarding courses in English as a second language. The Intensive English Program is administered by the Department of Modern Languages and Linguistics, Cornell University, Morrill Hall, Ithaca, New York 14853-4701. U.S.A. Application materials and information are available directly from the program or by calling 607/255-4863.

International Relations Concentration
Peter Katzenstein, faculty coordinator
Undergraduates interested in an international relations concentration should see Professor Peter Katzenstein (B-7 McGraw Hill).

Center for International Studies
See “Interdisciplinary Centers and Programs,” p. 11.

Program of Jewish Studies
S. Katz, director and undergraduate adviser (Near Eastern and Jewish history and religion), S. Bacharach (industrial and labor relations, sociology, Jewish thought and social theory), R. Brann (Hebrew literature and Judeo-Arabic culture), W. J. Dannhauser (Jews and Germans, contemporary Jewish thought, Gershom Scholem), S. L. Gilman (Yiddish literature, German-Jewish history and literature), G. Korman (Holocaust studies, Jewish labor history), A. S. Lieberman (ecology of man and landscape in Israel and the Middle East), D. I. Owen (Near Eastern and ancient Jewish history), D. S. Powers (history of Jews in Islamic lands), G. Rendsburg (biblical studies), E. Rosenberg (Jews in modern European and Anglo-American literature), N. Scharf (Hebrew language), A. Sussman (Shiloah Visiting Professor), E. Wolfson (Mellon Fellow) The Program of Jewish Studies is an outgrowth of the Department of Near Eastern Studies. The program has grown out of the conviction that Judaic civilization merits its own comprehensive and thorough treatment and that proper understanding of any culture is inconceivable without adequate knowledge of the language, literature, and history of the people that created it. Accordingly, the offerings in the areas of Hebrew language and literature have been considerably expanded, and courses in ancient, medieval, and modern Jewish history have been added to the program. Although further expansion of the program is anticipated, it presently enables students to obtain basic instruction and specialization in the fields of Semitic languages; the Hebrew Bible; the apocryphal and Tannaitic literatures; medieval Hebrew literature; modern Jewish thought; modern Hebrew literature, ancient, medieval, and modern Jewish history, and Yiddish language and literature. In some of these fields students may take courses both on graduate and undergraduate levels. Faculty throughout the University provide breadth to the program by offering courses in related areas of study.

Courses Offered 1986–87.
Elementary Modern Hebrew I and II (Near Eastern Studies 101–102)

Elementary Modern Hebrew (Near Eastern Studies 103) Summer.
Continuing Hebrew (Near Eastern Studies 104) Summer.
Society, Economy, and Religion in Ancient Israel: King David's Jerusalem (Near Eastern Studies 125–126)
Introduction to Near Eastern Civilization (Near Eastern Studies 197) Fall.
Intermediate Modern Hebrew (Near Eastern Studies 201–202) Fall.
Introduction to the Bible (Near Eastern Studies 223) Fall.
Introduction to the Prophets (Near Eastern Studies 227) Fall.
Introduction to Jewish Mysticism (Near Eastern Studies 229) Fall.
The Hebrew Literary Tradition: A Survey (Near Eastern Studies 231 and Comparative Literature 231) Fall.
The Lyrics of Love and Death: Medieval Hebrew Poetry in Translation (Near Eastern Studies 233) Fall.
Muslim Spain: Literature and Society (Near Eastern Studies 234 and Comparative Literature 234) Spring.
Israel: History and Geography (Near Eastern Studies 241) Spring.
Israel: History and Geography (Near Eastern Studies 242) Summer.
Introduction to Classical Jewish History (Near Eastern Studies 247) Fall.
Agriculture and Society in the Ancient Near East (Near Eastern Studies 264) Spring.
Hebrew for Academic Studies (Near Eastern Studies 271–272)
Modern History of the Middle East: Changing Politics, Society, and Ideas (Near Eastern Studies 294 and Government 358) Fall.
Advanced Modern Hebrew I (Near Eastern Studies 301) Spring.
Readings in Akkadian Texts (Near Eastern Studies 335–336)
Jews of Arab Lands (Near Eastern Studies 346)
Anti-Semitism in Germany and the Jewish Response (Near Eastern Studies 349 and German Literature 349)
Introduction to Field Archaeology in Israel (Near Eastern Studies 364) Summer.
The Divided Monarchy (Near Eastern Studies 365) Spring.
The History and Archaeology of Ancient Egypt (Near Eastern Studies 367)
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<th>Course Title</th>
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<tr>
<td>Jewish Workers in Europe and America 1789–1948</td>
<td>(Industrial and Labor Relations 381 and Near Eastern Studies 381)</td>
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<td>Political Concepts in the Modern Middle East: Religion and State</td>
<td>(Near Eastern Studies 396.1 and Government 352)</td>
<td>Spring</td>
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<td>Independent Study, Undergraduate Level</td>
<td>(Near Eastern Studies 491-492)</td>
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<td>Independent Study Honors Seminar</td>
<td>(Near Eastern Studies 499)</td>
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<td>Independent Study, Graduate Level</td>
<td>(Near Eastern Studies 691–692)</td>
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<td>Courses Not Offered 1986–87</td>
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<td>Elementary Classical Hebrew (Near Eastern Studies 121–122)</td>
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<td>Introduction to the Turkish Language (Near Eastern Studies 131–132)</td>
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<td>Elementary Yiddish (Near Eastern Studies 171–172)</td>
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<td>Masterpieces of Jewish Literature (Near Eastern Studies 204 and Comparative Literature 204)</td>
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<td>Modern Hebrew Literature in Translation (Near Eastern Studies 207–208)</td>
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<td>Readings in Classical Hebrew Literature: The Art of Biblical Narrative</td>
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<td>Readings in Classical Hebrew Literature (Near Eastern Studies 222)</td>
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<td>Judaic Literature in Late Antiquity (Near Eastern Studies 225)</td>
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<td>Aramaic (Near Eastern Studies 238)</td>
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<td>The History and Archaeology of Ancient Israel to 450 B.C.E. (Near Eastern Studies 243)</td>
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<td>The Emergence of the Modern Jew: 1648–1948 (Near Eastern Studies 245)</td>
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<td>Introduction to Biblical Archaeology (Near Eastern Studies 263)</td>
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<td>Ancient Seafaring (Near Eastern Studies 261 and Archaeology 275)</td>
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<td>Women in Jewish Literature: Tradition and the Literary Imagination</td>
<td>(Near Eastern Studies 291 and Comparative Literature 291)</td>
<td>Spring</td>
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<td>Women in the Hebrew Bible (Near Eastern Studies 292 and Women’s Studies 292)</td>
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<td>Advanced Modern Hebrew II (Near Eastern Studies 302)</td>
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<td>Seminar in Modern Hebrew Literature: The Short Story (Near Eastern Studies 303)</td>
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<td>Seminar in Modern Hebrew Literature: The Novel (Near Eastern Studies 304)</td>
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<td>The History and Archaeology of the Ancient Near East (Near Eastern Studies 366 and Archaeology 316)</td>
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<tr>
<td>Undergraduate Seminar in Biblical Literature: Prophecy in Ancient Israel</td>
<td>(Near Eastern Studies 322)</td>
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works of the heroic and courtly ages, investigating such themes as the nature of the epic hero and his society (Beowulf, Icelandic sagas, the Nibelungenlied), the development of the courtly hero and lover (Arthurian romances), and the sophisticated treatment of the human comedy (Sir Gawain and the Green Knight or Chaucer's Canterbury Tales). A "medieval" work by a modern author (J. R. R. Tolkien, C. S. Lewis, or John Gardner) will also be included.

102 King Arthur and His Knights
Fall, spring, or summer. 3 credits.
Hours to be arranged. Staff.
King Arthur and the knights of the round table inspired the best-selling literature of medieval Europe and remain a popular subject today. This course explores the Arthurian legend in medieval literature and at least one modern work (usually Mark Twain's Connecticut Yankee or a romance of T. H. White). Readings in English are chosen from the Lais of Marie de France, romances of Chrétien de Troyes, the quest for the Holy Grail (Parzival), the legend of Tristan and Isolde, Sir Gawain and the Green Knight, and Malory's Morte d'Arthur. Discussions will investigate fundamental problems raised by these stories: the individual in society, the development of the hero, the nature of love, and the dilemma of religious ideals in a secular world.

103 Fantasy and Science Fiction, Medieval and Modern
Fall or spring. 3 credits.
Staff.
We attempt to determine what fascinates the modern imagination about the Middle Ages and whether any continuity exists between medieval and modern works. The course opens with a survey of medieval fantasy selected from varied cultures, e.g. Grettir's Saga, The Voyage of Saint Brendan, Beowulf, Bernard Silvestris's Cosmographia, Lais of Marie de France, Arthurian romances, or Dante's Inferno. The second half of the course examines the relationship of such works to modern science fiction and fantasy with a "medieval" setting, such as J. R. R. Tolkien's The Hobbit, Italo Calvino's The Castle of Crossed Destinies, Mark Twain's Connecticut Yankee, Walter Miller's Canticle for Leibowitz, or works by Ursula Le Guin and Poul Anderson.

Graduate Seminars

601 Graduate Seminar
Fall or spring. 4 credits.
Topic to be announced.

602 Graduate Seminar in Bibliography and Methods
Not offered 1986–87

Related Courses
Courses in various aspects of medieval studies are offered each year in numerous cooperating departments, including Classics, Comparative Literature, English, History, History of Art, Modern Languages and Literatures (including German Literature, Romance Studies, and Russian Literature), Music, Near Eastern Studies, Philosophy, and the Society for the Humanities. An up-to-date listing of the courses offered in each term will be made available at the Medieval Studies office as soon as the Course and Time Roster is published.

Religious Studies
Religious studies is an interdisciplinary program reflecting a wide variety of academic interests and disciplines. The intention of the program is to provide a formal structure for the study of the religions of mankind at the undergraduate level. A student may fulfill the requirement for a concentration in religious studies by completing a minimum of four courses that have been approved by an advisor in the area of concentration.

The program is administered by a committee. The chairman is Professor Kretzmann, 320 Goldwin Smith Hall.

Courses in religious studies currently offered include the following:

Asian Studies 250 Introduction to Asian Religions
Fall. 3 credits.
B. Faure.

Asian Studies 355 Japanese Religions
Fall. 4 credits.
B. Faure.

Asian Studies 357 Chinese Religions
Spring. 4 credits.
B. Faure.

Asian Studies 650 Asian Religions
Spring. 4 credits.
B. Faure.

Classics 237 Greek and Roman Mystery Religions
Spring. 3 credits.
K. Clinton.

Comparative Literature 327 Christianity and Judaism
Spring. 3 credits.
C. Carmichael.

Comparative Literature 328 Literature of the Old Testament
Fall. 4 credits.
C. Carmichael.

Comparative Literature 421 Old Testament Seminar
Fall. 4 credits.
C. Carmichael.

Comparative Literature 426 New Testament Seminar
Spring. 4 credits.
C. Carmichael.

Comparative Literature 429 Readings in the New Testament
Fall. 4 credits.
J. Bishop.

History 368 Francis of Assisi and the Franciscans
Fall. 4 credits.
B. Tierney.

Near Eastern Studies 346 Jews of Arab Lands
Fall. 3 credits.
D. Powers.

Near Eastern Studies 357 Islamic Law and Society
Spring. 4 credits.
D. Powers.

Philosophy 213 Existentialism
Fall. 4 credits.
A. Wood.

Philosophy 263 Reason and Religion
Fall. 4 credits.
N. Kretzmann.

Philosophy 363 Topics in the Philosophy of Religion (Contemporary Philosophy of Religion)
Spring. 4 credits.
N. Kretzmann.

Russian and Soviet Studies Major
C. Emerson, chairperson; M. G. Clark, G. J. Staller, J. S. Svayvar, J. Vanek (economics); M. Rush (government); W. M. Pintner (history); W. W. Austin (music); U. Bronfenbrenner (psychology); P. Carden, C. Emerson, G. Gibson, S. Senderovich (Russian literature); L. H. Babby, W. Browne, R. L. Leed (Slavic linguistics).
The major in Russian and Soviet studies has the following requirements:
1) Qualification in Russian.
2) At least one course relating to Russia, at the 200 level or above, in each of the following departments: Government, Economics, History, and Russian Literature. (A course in another department may be substituted for one of the above with the consent of the major adviser.)

3) At least three additional courses, at the 300 level or above, in one of the following departments: Government, History, Economics, or Russian Literature. These courses are selected in consultation with the student's adviser and are to be approved as appropriate for a major in Russian and Soviet studies.

Professor Emerson will serve as adviser for all majors, but each student should also designate an additional adviser in the department in which his or her work is concentrated.

Courses

**Economics 329 Eastern Europe Today:**
- Economics, Government, Culture (also Government 326 and Russian Literature 329)
- Spring. 4 credits.
  - G. Staller, M. Rush, G. Gibian.

**Economics 367/368 Comparative Economics Systems**
- Fall. 4 credits.
  - G. Staller.

**Economics 381 Economics of Participation and Worker Management**
- Fall. 4 credits.
  - J. Vanek.

**Economics 382 The Practice and Implementation of Self-Management**
- Spring. 4 credits.
  - J. Vanek.

**Economics 673 Economic Development**
- Fall. 4 credits.
  - J. Vanek.

**Economics 681 Self-Management**
- Fall. 4 credits.
  - J. Vanek.

**Economics 682 Seminar on Economics of Participation and Labor-Managed Systems**
- Spring. 4 credits.
  - J. Vanek.

**German 376 Contemporary Soviet Latvian Literature**
- Fall. 4 credits. Taught in Latvian.
  - I. Ezergailis.

**Government 333 Government and Politics of the Soviet Union**
- Fall. 4 credits.
  - M. Rush.

**Government 446 Comparative Communism**
- Fall. 4 credits.
  - M. Rush.

**Government 481 Foreign Policy of the U.S.S.R.**
- Spring. 4 credits.
  - M. Rush.

**History 362 Russian History to 1800**
- Fall. 4 credits.
  - R. P. Bartlett.

**History 486 The Formation of the Russian Intelligensia, 1700–1850**
- Fall. 4 credits.
  - R. P. Bartlett.

**History 677 Seminar in Russian History**
- Fall. 4 credits.
  - R. P. Bartlett.

**Industrial and Labor Relations 344 Comparative Economic Systems: Soviet Russia**
- Fall. 4 credits.
  - M. G. Clark.

**Polish 131–132 Elementary Course**
- 131, fall; 132, spring. 3 credits each term.
  - W. Browne.

**Russian 103 Freshman Seminar: Classics of Russian Thought and Literature**
- Fall or spring. 3 credits.
  - Staff.

**Russian 104 Freshman Seminar: Nineteenth-Century Russian Literary Masterpieces**
- Fall or spring. 3 credits.
  - P. Carden and staff.

**Russian 105 Freshman Seminar: Twentieth-Century Russian Literary Masterpieces**
- Spring. 3 credits.
  - Staff.

**Russian 107 Freshman Seminar: Writers on Writing**
- Fall or spring. 3 credits.
  - Staff.

**Russian 201–202 Readings in Russian Literature**
- 201, fall; 202, spring. 3 credits each term.
  - C. G. Emerson.

**Russian 308 Themes from Russian Culture II**
- Spring. 4 credits.
  - C. G. Emerson.

**Russian 331 Russian Poetry**
- Fall. 4 credits.
  - S. Senderovich.

**Russian 387 Teaching and Learning: Ideas of Education in the Western Tradition (also Comparative Literature 387)**
- Spring. 4 credits.
  - P. Carden and guest lecturers.

**Russian 388 Ideas and Form in Novels of Social Inquiry (also Comparative Literature 388)**
- Fall. 4 credits.
  - G. Gibian.

**Russian 393 Honors Essay Tutorial**
- Fall or spring. 4 credits each term.
  - Staff.

**Russian 403–404 Linguistic Structure of Russian**
- 403, fall; 404, spring. 4 credits.
  - L. H. Babby.

**Russian 405–406 Advanced Russian Morphology and Syntax**
- 405, fall; 406, spring. 4 credits.
  - L. H. Babby.

**Russian 407 Russian for Teachers**
- Fall. 4 credits.
  - R. L. Leed.

**Russian 413–414 Advanced Conversation and Stylistics**
- Fall; 413, fall; 414 spring. 4 credits.
  - L. and S. Paperno.

**Russian 418 Pedagogy and the Nineteenth-Century Novel (also Comparative Literature 418)**
- Fall. 4 credits.
  - P. Carden.

**Russian 431 Contemporary Russian Prose**
- Fall. 4 credits.
  - G. Gibian.

**Russian 432 Pushkin**
- Spring. 4 credits.
  - S. Senderovich.

**Russian 491 Reading Course: Russian Literature in the Original Language**
- Fall or spring. 1 credit.
  - Staff.

**Russian 602 Old Russian**
- Fall. 4 credits.
  - L. H. Babby.

**Russian 611 Supervised Reading and Research**
- Fall or spring. 2–4 credits.
  - Staff.

**Russian 621 Old Russian Literature**
- Spring. 4 credits.
  - S. Senderovich.

**Russian 624 Russian Romanticism**
- Fall. 4 credits.
  - S. Senderovich.

**Russian 633–634 Russian for Graduate Specialists**
- 633, fall; 634, spring. 4 credits each term.
  - L. and S. Paperno.

**Russian 671 Graduate Seminar**
- Fall. 4 credits.
  - C. G. Emerson.

**Russian 672 Seminar in Nineteenth-Century Russian Literature**
- Spring. 4 credits.
  - P. Carden.

**Russian 700 Graduate Seminar: Neglected Masterpieces of Short Russian Prose**
- Spring. 4 credits.
  - G. Gibian.

**Serbo-Croatian 131–132 Elementary Course**
- Fall, 132, spring. 3 credits each term.
  - W. Browne.

**Serbo-Croatian 133–134 Intermediate Course**
- Fall, 133, spring. 3 credits each term.
  - W. Browne.

**Social Relations Major**

W. W. Lambert, director of undergraduate studies, 238 Urs Hall, 255-6390

The major in social relations is offered jointly by the Department of Anthropology and the Department of Sociology. It provides the student with basic competence in cultural anthropology, social psychology, and sociology and gives particular emphasis to the common methods of research in these disciplines. The student is expected to obtain a grasp of the common interests and unique insights of the three disciplines, and in the senior Social Relations Seminar is expected to integrate aspects of their theory and data.

Students seeking admission to the program should have completed the following prerequisites: (a) Sociology 101, Sociology 201, or Anthropology 201; (b) Psychology 101 or 280 or Sociology 280; and (c) Sociology 301 or an equivalent course in statistics.

The major calls for a minimum of 36 credits of course work as follows:

1) two related courses to be selected in consultation with the major adviser, in each of the three following disciplines: anthropology, social psychology, and sociology. Among these courses should be at the 300 level or above, but in special circumstances the adviser may approve one or two courses at the 200 level.

2) at least one course in methods, to be selected from the following: anthropological methods, techniques of experimentation (psychology), methods in sociology, philosophy of science or of social science, or advanced statistics.

3) at least one course in theory related to social relations

4) the senior seminar in social relations (Sociology 497 or Anthropology 495)

A list of the courses that may be used to satisfy the requirements for a major in social relations is available from any of the major advisers.

**Society for the Humanities**

A. D. White Center for the Humanities, 27 East Avenue. Jonathan Culler, director

Fellows for 1986–87: Jay D. Bolter (University of North Carolina), Richard Boyd (Cornell University), Samuel R. Delany (writer), Mary Jacobus (Cornell University), Evelyn Fox Keller (Massachusetts Institute of Technology), Kenneth Knoespel (Georgia Institute of Technology).
Technology), Dean MacCannell (University of California, Davis), Robert Markley (Georgia Institute of Technology), Peter Railton (University of Michigan), Sally Shuttleworth (University of Leeds), Barbara Von Eckardt (Colgate University), Eric White (University of Colorado).

The Society awards annual fellowships for research in the humanities in three categories: senior fellowships, faculty fellowships, and junior postdoctoral fellowships. The Fellows offer, in line with their research, informal seminars intended to be exploratory or interdisciplinary.

These seminars are open to graduate students and suitably qualified undergraduates. There are no examinations, and it is at the discretion of the Fellow whether to require seminar reports or, in addition, a research paper. Students who want credit for the course should formally register in their own college. Persons other than those officially enrolled may attend as visitors with permission of the Fellow.

The Society’s theme during the 1986–87 year will be the Humanities and Science: A Reassessment.

Courses

101 Science as Literature: The Profession of Science Fall. 3 credits. Freshman Seminar.

M W F 9:05. J. Lumley.

Robert Ornerstein claims that science turns the impossible into the boring. Einstein contends that science, in its purest form, uncovers "the grandeur of reason incarnate in existence." In readings ranging from Darwin to Einstein to Asimov, we will try to discover how a discipline can be so variously defined and described.

102 Science as Literature: The Impact of Science on Self-Image Spring. 3 credits. Freshman Seminar.

M W F 9:05. J. Lumley.

Man’s rational perception of his place in nature frequently clashes with his emotional need to elevate himself above nature. In the last 350 years, science has had the uncomfortable habit of dethroning him as master of the universe. In this course, with readings from Galileo, Darwin, Freud, and others, we shall follow man’s journey from a position of dominance in a geocentric, divinely ordered universe to that of a genetically programmed organism in a decaying biosystem. We will examine how well, or how completely, he has accommodated his dreams to the new worlds born of science.

103 Portraits of Status, Power, and Sex Fall. 3 credits. Freshman Seminar.


Many portraits are not simple records of appearances, but are portraits of social status, power, or sex that aim to flatter, criticize, or titillate. We will learn to recognize portraits like these in painting and drawing, social science, poetry and fiction, and advertising, and will examine them in relation to the medium and social environment in which they have been created. Spanning six centuries, the portraits will range from Chaucer’s Wife of Bath to ads in Playboy and Vogue. Our focus will be on portraits of women and the upper classes in England, France, and America.


An examination of Gilbert and Sullivan’s major works in the context of English Victorian theater and society. Special attention will also be given to their skillful integration of words, music, and action and to the performers for whom many of their roles were designed.

409 The Meaning of Literacy in the Computer Age Fall. 3 credits.


An examination of the computer as a medium of verbal and symbolic communication, a new technology for reading and writing. This is not a course in word processing; rather, it is an attempt to identify those qualities of the electronic medium that set it apart from its predecessors in Western culture (the printed book, the handwritten codex, and the papyrus roll). We will read selected texts that illustrate stages in the history of literacy and examine innovative computer programs for reading and writing. No previous knowledge of computers is required.

411 Naturalistic Methods in Philosophy Fall. 3 credits.


An examination of recent philosophical attempts to analyze fundamental epistemological, semantic, psychological, and moral notions in causal terms using categories borrowed from the empirical sciences. This seminar will explore the consequences of such attempts for our understanding of the relation between scientific and philosophical inquiry.

412 Ideology in Science and Ethics: A Case Study Spring. 3 credits.


The seminar will examine the current controversy over human sociobiology with special attention to the following questions: (1) Can we make of proposals to settle moral and political questions at least partly on the basis of empirical findings about human nature? (2) By what methods, if any, can insights about human motivations and social psychology be gained from biological (and nonbiological) comparisons? (3) What conceptions of social ideology and of its relation to scientific methodology and to moral reasoning will best aid us in assessing the charges of ideological bias that participants in the dispute over human sociobiology typically level at their opponents? Readings will be drawn from the work of, for example, Wilson, Alexander, Tivers, Gould, Lewontin, and Kitcher.

413 Science/Fiction: Radical Splits in a Marginal Practice of Writing Fall. 3 credits.

T 12:30–2:00. S. R. Delany.

In this seminar, we will read and reread carefully the science fiction stories of John Varley and the science fiction novels of William Gibson. We shall look at society, science, and psychoanalysis, not so much as they are represented and thematized in our study texts, but rather as, in a critical dialogue, they are problematized at various textual nodes. The seminar will be heavily theoretical and will encourage informed conflicts and participatory discussion. The stories we will read are contained, some of them, in Varley’s two story collections, The Persistence of Vision and Picnic on Nearside. As well as we will explore some of Varley’s uncollected stories, including “Blue Champagne,” “The Pusher,” and “Press Enter >.” The science fiction novels of William Gibson that we will be reading are Neuromancer and, if available, Count Zero.

415 Feminism, Psychoanalysis, and Sexual Difference Fall. 3 credits.

W 12:30–2:00. M. Jacobus.

How does psychoanalysis produce its definitions of sexual difference? How does “woman” (as a figure for sexual difference) sustain psychoanalytic theory itself? The course will examine the ideological bases and intellectual methods through which Freud ventured to produce and examine the question of sexual difference. The course will include Lacan’s rereadings of Freud and his theories of feminine sexuality in the light of work by Lacanian and post-Lacanian feminists in England, France, and the United States.

416 Mapping the Feminine Body Spring. 3 credits.

W 12:30–2:00. M. Jacobus.

How has feminist criticism attempted to reinscribe the feminine body in the literary text? What is the function of representations of the female body in contemporary feminist writing and theory? How does their mapping of the body challenge that of Freudian theory, and can it be accused of a return to "essentialism"? Using a variety of recently translated works by French feminists such as Kristeva, Irigaray, and Kofman, we will attempt to extend analyses of the body developed by critics such as Scarry and Bersani to questions that specifically relate to women. Readings will include case histories by Freud and Breuer on the hysterical body as well as accounts of the "case" of hysteria, female homosexuality, and critiques of the psychoanalytic gaze that takes woman as its object.

418 Man’s Place in Nature Fall. 3 credits.

Spring. 3 credits.

E. F. Keller.

To the extent that science is seen as exemplified by physics, the answer that modern science has given to the question of man’s place in nature has been a resounding silence. Only evolutionary biology—an exceptional science in many respects—has undertaken to provide us with an answer to this question. The purpose of this seminar is to examine the kinds of answers evolutionary theory has given from Darwin to contemporary times. In particular, we will examine the conceptions of man and nature that underlie Darwinian and to a certain extent, paying special attention to implicit gender and sexual imagery attaching both to man and to nature and leading finally to the question: What place in these scripts, if any, does woman have in nature?

419 Science and Myth in Modern Culture Fall. 3 credits.


This seminar explores several modern mythic forms and figures: nuclear weapons, Marilyn Monroe, statistics, Southern California, space, “freedom,” and James Bond. Levi-Strauss calls myth “the science of the concrete,” but resists applying his insight to modern mythologies. The central questions of the seminar will be methodological: for example, what binary oppositions operate modern consciousness? The proposed syllabus of oppositions framing modern mythologies include male/female, white/nonwhite, science/myth,” rural/urban, rich/poor, and others.

421 Literature, Science, and Ideology: The Crisis in English Thought, 1660–1750 Fall. 3 credits.


The century following the English Civil War proved crucial in shaping modern conceptions of literature and science. This seminar (which requires no specialized scientific background) will examine the contradictory impulses—toward “progress” or “revolution” on the one hand and toward “order” and repression on the other—that characterize a variety of literary and scientific texts. Readings will include works by Newton, Boyle, Descartes, Sprat, Dryden, Locke, Shadwell, and Congreve. The seminar will conclude with discussions of two historically significant novels: Richardson’s Clarissa and CieIand’s Fanny Hill.

424 The Foundations of Ethics Spring. 3 credits.

T 12:30–2:00. P. Railton.

Ethical naturalists have held that moral theory can find a place among our empirical, scientific theories. The dominant view among contemporary philosophers has been that ethical naturalism is obviously untenable, since it violates the distinction between questions of fact and questions of value. Yet recent developments in epistemology and the philosophy of science have made problematic the arguments and assumptions upon which that rejection of ethical naturalism rests. This seminar will inquire into the possibility of developing and defending a contemporary form of ethical naturalism. In addition to recent work in philosophy, we may read such authors as Hume, Moore, Marx, and Durkheim.

426 Narrative and Science Spring. 3 credits.

M 12:30–2:00. S. Shuttleworth.

This course will focus on the construction of psychology in Victorian literary and scientific texts, paying particular attention to the ways in which their
language and structure reinforce or interrogate dominant social and gender-based assumptions. We will be concerned specifically with the Victorian preoccupation with self-control and its obverse, mental breakdown, as well as the construction of notions of femininity and insanity. Readings will include novels by Charlotte Bronte and Wilkie Collins, popular Victorian works on psychology, and modern critical texts on the interrelations of literature and science.

427 Appraising an Immature Science: The Case of Cognitive Science Fall. 3 credits.
Although contemporary philosophers of science have discussed the problem of characterizing and appraising instances of mature science, virtually nothing has been written on the subject of immature science. The seminar will explore this problem in two ways: first, in the abstract, and, second, with respect to a specific case, namely, the newly emerging field of cognitive science.

428 Contemporary Cosmology and Narrative Theory Spring. 3 credits.
Modern physics offers a privileged description of the ultimate conditions of existence. It should therefore contribute importantly to any comprehensive imaginative vision of the human situation. This seminar will consider what such an imaginatively satisfying representation of the universe can be contrived, consistent with the results of physical inquiry.

Contemporary scientific accounts of cosmic evolution will provide the basis for speculation concerning the narrative shape of natural history.

430 Mathematics and Language Spring. 3 credits.
Exploration of relations between the humanities and science through comparison of aspects of mathematical and linguistic codes, such as the role of paradoxes and epistemological uncertainty, of thought experiments and frame language, and of "story" problems and narrative form.

South Asia Program
The South Asia Program coordinates research, teaching, and special campus events for Bangladesh, India, Pakistan, Nepal, and Sri Lanka. The program faculty includes members from a variety of disciplines, including agricultural economics, anthropology, architecture, art, government, linguistics, planning, and rural sociology. Undergraduates with a special interest in the region may major in Asian studies with a South Asian concentration. The languages regularly offered are Bengali, Hindi, Nepali, Sinhala, Tamil, Telugu, Urdu, Cebuano (Bisayan), Indonesian, Javanese, Tagalog, Thai, and Vietnamese, for which National Resource Fellowships are available. Intensive instruction is offered in the Full-Year Asian Language Concentration (FALCON) in beginning and intermediate levels. The formal program of study is enriched by a diverse range of extracurricular activities, including an informal weekly luncheon seminar, the concerts of the Ganjam Ensemble, a weekly Southeast Asia film series, and public lectures. The John M. Echols Collection on Southeast Asia, in Olin Library, is the most comprehensive collection on this subject in America.

Undergraduates may major in Asian studies with a focus on Southeast Asia and its languages, or they may elect to take a concentration in Southeast Asia studies by completing 15 credits of course work. Students interested in exploring these opportunities should consult the director, Southeast Asia Program, 120 Urs Hall.

Undergraduate Research Program
Marilyn Williams, director, 135 Goldwin Smith Hall, 255-3830
The Undergraduate Research Program is described in the introductory section, p. 102.

Women's Studies Program
Women's Studies, a university program in the College of Arts and Sciences, has three goals: to encourage the development of women and gender studies as a specific field of study for women and men; to examine assumptions about women in various disciplines and to develop, systematize, and integrate back into the disciplines new knowledge about women in disciplines, especially service activities with the extension divisions of the University.

The program is guided by a board composed of faculty, staff, and students at Cornell and members of the Ithaca community who have an intellectual interest in women's studies. Program facilities in Uris Hall, including reading room, informal lounge, and seminar room, are open to all interested students and faculty.

Program Offerings
Undergraduate students in the College of Arts and Sciences wishing to major in women's studies can design their own major through the College Scholar or Independent Major Programs. Any graduate student in the University may elect a women's studies minor. Students interested in either the major or the minor should obtain further information from the Women's Studies Office, 332 Uris Hall.

The program typically sponsors a noncredit seminar/student group for graduate students and faculty to facilitate sharing of knowledge across disciplinary lines. During the academic year the program also sponsors frequent public lectures dealing with social, political, and intellectual issues in women's studies.

The Concentration
Undergraduate students who wish to graduate with a concentration in women's studies should consult with the director of undergraduate studies in women's studies to select an adviser. In collaboration with that adviser, students will design a coherent program in women's studies to complement their major. Before graduation students will submit to their adviser a final summary on their completed work in women's studies. The concentration is open to students in all colleges of the University.

The concentration in women's studies consists of four courses. Typically, two courses are selected from the list of general courses and two from the list of specialized courses below. Freshman seminars, related courses, or independent study in women's studies may be substituted for specialized courses in the concentration with the prior approval of the adviser.

For further information or to meet with the director of undergraduate studies to select an adviser, students should contact the Women's Studies Office, 332 Uris Hall, 255-6480.

Distribution Requirement
Distribution requirements are satisfied by any two Women's Studies courses in the following categories.

Social Sciences: (a) any two of 231, 238, 244, 277, 320, 321, 353, 395, 422, 425, 428, 450, 468 or (b) any one of 110, 365, 493, plus one from list a.
History: any two of 227, 238, 326, 357
Humanities: (a) any two of 248, 251, 297, 348, 363, 451, 453, 456, 476, or (b) any one of 110, 365, 493, plus one from list a.

Courses
Keeping in mind that women's studies is interdisciplinary, it is useful to distinguish six core areas, or foci, within the program: ideology and culture, institutions and society, history, literature and the arts, psychology and human development, and natural sciences.

The program offers undergraduate and graduate courses in all of the core areas, both independently and in conjunction with other departments. Women's studies courses are grouped into four categories to assist students in selecting the level or degree of specialization suited to their program.

I) Freshman Seminars
II) General courses (which provide a general introduction to the area or core focus within women's studies)
III) Specialized courses and seminars (which have smaller enrolments and focus upon more specialized topics within each of the core areas).
IV) Related courses and seminars (which need not focus exclusively upon women's studies issues but include significant consideration of sex differences, feminist criticism, or gender).

I. Freshman Seminars
106 Women and Writing (also English 105) Fall and spring. 3 credits.
Hours to be arranged. Staff.
What is a woman? How does she confront her personal experience? Does she play a special role in history, in our definition of society, or in our understanding of language and literature? This course will explore the relation between women and writing. We will discuss writings by and about women, debate our attitudes toward feminism, and analyze the relevance of these questions to our own written work. Individual sections will emphasize different aspects of the relation between women and writing. Which section to choose should depend on your own experience with women. Women appear in private or autobiographical writings, historical contexts, and/or literary works. Further
information on specific sections is available in the Freshman Seminar Program office. Textual overlap among the sections is kept to a minimum so that students can take more than one Women and Writing seminar during their time at Cornell.


II. General Courses

110 Introduction to Women's Studies Fall or summer. 3 credits. Limited to 25 students. T R 2:30–3:45. C. A. Martin.

This course introduces students to critical approaches in feminist scholarship on the cultural, socioeconomic, and political situation(s) of women. Particular attention will be paid to the conceptual challenges and dangers posed by attempts to study "women" without taking account of relations between race, class, and gender in ideological and social formations. Readings will draw on work in various disciplines and will include literary texts and visual images.

214 Biological Basis of Sex Differences (also Biological Sciences 214 and Biology and Society 214) Spring. 3 credits. Prerequisite: one year of introductory biology.

Lecs, T R 8:30–9:55, and occasional discs to be arranged. J. E. Fortune.

The structural and functional differences between the sexes are examined. Emphasis is placed on mechanisms of mammalian reproduction; and where possible, special attention is given to studies of humans. Current evidence on the effects of gender on nonreproductive aspects of life (behavior, mental and physical capabilities) is discussed. The course is intended to provide students with a basic knowledge of reproductive endocrinology and with a basis for objective evaluation of sex differences in relation to contemporary life.

227 Modern American Sex Roles in Historical Perspective (also History 227) Spring. 4 credits. Each section limited to 20 students. Intended primarily for sophomores. Not offered 1986–87. Hours to be arranged. M. B. Norton.

A reading and discussion course. The class will begin by examining sex roles in the United States in the 1980s, looking at a variety of sources like popular magazines and contemporary commentaries. We will then move backward in time to uncover the roots of current attitudes. The students will help to determine which topics the class will investigate in detail.

244 Language and the Sexes (also Linguistics 244) Spring. 4 credits. Not offered 1986–87. S. McConnell-Ginet.

277 Psychology of Sex Roles (also Psychology 277 and Sociology 277) Spring. 3 or 4 credits. (4th credit is for optional empirical research project). Limited to 200 students. Prerequisite: an introductory psychology course.

T R 2:30–4. S. Bonn.

Addresses the question of why and how adult women and men come to differ in their overall life-styles, work and family roles, personality patterns, cognitive abilities, etc. This broad question is examined from five perspectives: (a) the psychoanalytic perspective; (b) the biological perspective; (c) the historical and cultural evolutionary perspective; (d) the child development perspective; and (e) the social-psychological and contemporaneous perspective. Each of these perspectives is also brought to bear on more specialized phenomena relating to the psychology of sex roles, including psychological analony, women's conflict over achievement, the male sex role, egalitarian marriage relationships, gender-identified childrearing, female sexuality, homosexuality, and transsexualism.

321 Sex and Gender in Cross-Cultural Perspective (also Anthropology 321) Fall. 4 credits.

M W F 2:30. K. S. March.

An introduction to the study of sex roles cross-culturally and to anthropological theories of sex and gender. The course examines various aspects of the place of the sexes in social, political, economic, ideological, and biological systems to emphasize the diversity in gender and sex role definition around the world.


A survey of women's experiences in America from the seventeenth century to the present. Among the topics to be discussed are women's familial roles, the changing nature of household work, the women's rights movement, employment of women outside the home, and contemporary feminism.


M. Katzenstein.

The course examines aims and strategies of the feminist movement in the United States and the response of both society and the state to feminist claims. It is thus a course about political protest and the capacity of American institutions to promote and shape, as well as to counter social change. In examining the law and public policy on such issues as job discrimination, wife battery, rape, abortion, etc., the course explores the contradictions between, and the congruence of, the dual ideals of individual choice and group equality.

III. Specialized Courses and Seminars

231 Power and Marginality: Women in the Third World Spring or summer. 3 credits. Limited to 15 students.


Focuses on the effects of three social, political, and economic systems—family structures, education, and labor—on the lives of women from Third World countries. Analyzes contemporary theories of development and feminism, using case studies from different cultures to clarify the political, economic, and ideological interconnections between First World and Third World nations.

238 The Historical Development of Women as Professionals, 1800–1980 (also Human Development and Family Studies 238) Spring. 3 credits. Students in endowed units must register for Women's Studies 238.


The historical evolution of the female professions in America (midwifery, nursing, teaching, librarianship, prostitution, home economics, and social work) as well as women's struggles to gain access to medicine, law, the clergy, and the academy. Lectures, reading, films, and discussion are geared to identifying the cultural patterns that fostered the concepts of gender-specific work and the particular historical circumstances that created these different work opportunities. The evolution of professionalism and the consequences of professionalism for women, family structure, and American society are also discussed.

248 Major Nineteenth-Century Women Novelists (also English 248) Fall. 4 credits. M W F 1:25. J. Blackall.

This course gives particular attention to the biographical and social circumstances surrounding the novels, their critical reception within their own time, and the themes and subject matter that women novelists elected to write about. The reading includes masterworks and certain other works that exerted a major imaginative impact on contemporary readers. Readings are Austen, Persuasion; C. Bronte, Jane Eyre; E. Bronte, Wuthering Heights; Gaskell, Mary Barton; Stowe, Uncle Tom's Cabin: Eliot, The Mill on the Floss; Gilman, The Yellow Wallpaper; Chopin, The Awakening.

In addition, two twentieth-century works, Jean Rhys's Wide Sargasso Sea and Edith Wharton's Ethan Frome, will be approached as imaginative sequels to Jane Eyre and Wuthering Heights respectively.


This course will be particularly concerned with self-consciously experimental novels and with some of the questions about women's experience, perspective, and language raised by recent feminist criticism. We will read works by Virginia Woolf, Jean Rhys, Djuna Barnes, Doris Lessing, Toni Morrison, Margaret Atwood, Alice Walker, and others.

297 Beyond the Stereotype: Images of Women in the Middle East (also Near Eastern Studies 297) Spring. 3 credits.


We will be reading nonfictional works on women, as well as works of fiction on and by women, in an attempt to re-evaluate certain stereotypes and roles ascribed to Middle Eastern women throughout history. Our starting point will be the Koran, the text that continues to regulate the formation of the image of women. We will investigate the degree of acceptance or rejection of such an imposed image as it manifests itself in contemporary texts.

320 Gender, Race, and Education (also Human Service Studies 320) Fall. 3 credits. Students in endowed units must register for Women's Studies 320.


Focuses on the role of the educational system in the construction and reproduction of gender and racial inequality. Examines the macroscopic relations between schools and society, specifically the institutional connections between structures of learning and the state, and the organization of work. Topics to be addressed include contrasting perspectives on the role of the educational system, the control and governance of schools, the construction of educational goals and curricula, classroom practice and social structure, the concept of the "hidden curriculum" and the reproduction of social inequality, and the effects of schooling on women and minorities. The goals of this course are (1) increasing awareness of the ideological interconnections between schools and other social institutions (2) familiarization with selected writings and contemporary research in the sociology of education, and (3) a critical comprehension of the mechanisms through which schools participate in the reproduction of gender and racial inequality. Readings include theoretical texts as well as empirical case studies from the United States and Britain. A background in sociology, education, and women's studies will be useful, although it is not a necessary prerequisite for taking this course.


A survey of the (mainly British) female literary tradition from the French Revolution to early twentieth-century modernism. The course will trace the dual legacies of romanticism and revolution through their monstrous and gothic forms, exploring their repressed presence in Victorian women's fiction until they surface again in the writing of the 1848 revolution and after. As well as the social protest literature of the mid-nineteenth century, we will look at the literature of the (female) uncanny, through which Victorian women writers confront their inner worlds, before turning to the emergence of the "new woman" and Victorian women's fiction at the end of the nineteenth century and to the beginnings of the twentieth-century modernist tradition by which modern women's writing is conceived. Texts will include works by Wollstonecraft, Austen, Mary Shelley, Emily and Charlotte Bronte, Eliot, Barrett Browning, Gaskell, Gilman, Schreiner, and Woolf.
anthropology as a discipline from the earliest explorers' accounts, through the florescence of their importance in early American ethnographic description, and into the contemporary resurgence of interest in personal narratives as windows onto both the social or cultural construction of the person and the personal construction of the social or cultural. Course materials will draw heavily upon women's lives and their representations, both to contrast women's and men's accounts of the world and to underscore the special significance of women's narratives in anthropology.

408 Gender Symbolism (also Anthropology 408) Spring. 4 credits.

Hours to be arranged. K. March.

This seminar looks at cultural meaning constructed around biological sex differences. We begin from the assumption that both humans and gender are culturally defined as a system of categories and meanings that interact with people's cognitive, intellectual, and affective experience of the world. The seminar addresses two theoretical perspectives: (1) to analyze the relations between gender symbols and the social worlds of the people who believe in them.

415 Feminism, Psychoanalysis, and Sexual Difference (also Society for the Humanities 415) Fall. 3 credits.


How does psychoanalysis produce its definitions of sexual difference? How does "woman" (as a figure for sexual difference) sustain psychoanalytic theory itself? The course will examine the ideological bases and intellectual methods of psychoanalysis from the point of view of feminist inquiry. Starting with Freud's founding texts on femininity and debate with the early feminist psychoanalysts, we will explore the ways in which feminist theory has engaged with psychoanalysis over the question of sexual difference. The course will include Lacan's rereadings of Freud and discussion of his theories of feminine sexuality in the light of work by Lacanian and post-Lacanian feminists in England, France, and the United States.

425 Gender Relations and Social Transformation (also Rural Sociology 425) Fall. 4 credits.

A comparative analysis of women's contribution to domestic-household, agricultural, and industrial work as productive processes changes internationally. The course emphasizes the configuration of various economic and social sectors and their realignments within countries in response to technology transfer, the transformation of the labor market, and changing family forms.

428 Spirit Possession, Shamanism, Curing, and Witchcraft (also Anthropology 428) Spring. 4 credits. Limited to 20 students. Prerequisite: background in anthropology or women's studies. Not offered 1986–87.

Hours to be arranged. D. Holmberg.

An anthropological consideration of witchcraft, shamanism, and cults of spirit possession, with special attention to the role of gender. Classic anthropological accounts of non-Western societies will be considered along with ethnographic and historical accounts of Western societies. The course also addresses gender and the anthropology of myth, ritual, and symbolism.

445 Jane Austen, Elizabeth Gaskell, and George Eliot (also English 445) Fall. 4 credits.

A close focus on five masterworks of the nineteenth century—Austen's Pride and Prejudice and Emma; Gaskell's Life of Charlotte Brontë and Wives and Daughters, and Eliot's Middlemarch—with particular reference to the circumstances, biographical and social, from which these works emerged. We will examine these writers' perception of the institution of marriage; their delineation of the problem of attaining self-sufficiency and self-expression within a domestic and rural community, especially for women; and their concepts of a "heroine" and a "hero." Emphasis will be on reading and discussion. Participants will keep journals reflecting their personal responses to the books and their pursuit of chosen topics, these notes leading to one final essay of moderate length.

450 Seminar in the Psychology of Gender (also Psychology 450) Fall. 4 credits. Limited to 15 junior and senior psychology majors. Prerequisite: Psychology/Sociology/Women's Studies 277 and permission of instructor.


The seminar is designed primarily for advanced students in psychology who have a strong interest in empirical research. Each time the course is offered, a particular research topic will be selected by the instructor for consideration in depth. The topic will be announced at the first meeting of the course. All interested students should attend that meeting.

453 Victorians and Modernists: Literary Legends from Wilde to Woolf (also English 453) Spring. 4 credits. Not offered 1986–87.

S. Siegel.


J. F. Blackall.

A representative selection of the best fiction of three distinguished American women writers with particular regard for their representation of women in relation to environment, for their characteristic themes and materials, and for their practice of the craft of fiction.


M. Katzenstein.

A study of the assumptions and arguments of liberal feminism. The course will have three foci. It will examine the doctrines of liberal feminism, consider how these doctrines translate into political issues and programs, and appraise the merits of the critiques from the left and right.

476 Women's Poetry (also English 476) Spring. 4 credits. Limited to 25 students. Prerequisite: permission of instructor.


A selection from the women's poetry of the early twentieth century, starting with the 1890s and ending with the 1930s. A comparative study of Middle English and Old English poetry will be explored. Readings: Wharton The House of Mirth, Summer, The Age of Innocence, and selected short stories; Cather, The Song of the Lark, My Antonia, A Lost Lady, and selected short stories; and Welty, A Curtain of Green, The Wide Net, The Golden Apples, and The Robber Bridegroom. Discussion format with three essays.

485 French Feminism (also French 485) Spring. 4 credits.

N. Furman.

This course will examine the political, theoretical, and literary concerns of contemporary French feminist writers. Readings will include representative texts by Simone de Beauvoir, Marguerite Duras, Luce Irigaray, Monique Wittig, and Helene Cixous. Taught in English.

499 Directed Study Fall or spring. Variable credit. Prerequisite: one course in women's studies and permission of a faculty member of the Women's Studies Program Board.

Hours to be arranged. Staff.

513 The Political Economy of Women and Work (also City and Regional Planning 513) Fall. 4 credits.

Hours to be arranged. L. Beneria.

This course deals with the question of how best to understand and analyze the economic condition of women, starting with some general issues about the "question of origins," reproduction and production, and...
the underestimation of women's economic activities. It then
deals with different approaches to the analysis of
women's work in the household and in the labor market
(from an economic and feminist perspective). The
empirical material will concentrate mostly on the
United States with some glances at other industrial
countries in the international economy.

514 The Political Economy of Women and Work II
(also City and Regional Planning 514) Spring. 4 credits.
Hours to be arranged. L. Beneria.
A continuation of Women's Studies 514.

[526 Graduate Seminar in the History of American
Women (also History 626) Fall. 4 credits. Limited to
graduate students, except for seniors with extensive
women's studies/history backgrounds. Not offered
M. B. Norton.
A reading and research seminar intended primarily for
graduate students. Major works in American women's
history will be carefully scrutinized, and each student
will prepare a lengthy research paper.

638 Contemporary German Women Writers (also
German Literature 638) Spring. 4 credits. Not offered
I. Ezergailis.

680 Black Women and Their Fictions Fall.
4 credits.
Hours to be arranged. H. Gates.
This course intends to define the precise shape and
contours of the tradition of black women's writing in
English. How do black women use language to
represent their experiences? How does their writing
resemble or diverge from the black male tradition? How
does black feminism differ from white feminism?
These are the concerns of this class. Readings are by
Herriot E. Wilson, Frances Harper, Anna Julia
Cooper, Nelly Larsen, Zora Neale Hurston, Gwendolyn
Brooke, Ann Petry, Paule Marshall, Toni Morrison, Toni
Cade Bambara, Gayle Jones, Alice Walker, Gloria
Naylor, and Jamaica Kincaid.

685 Seminar in Sex Differences and Sex Roles
(also Psychology 685 and Sociology 685) Fall.
4 credits. Prerequisite: permission of instructor. Not
S. Bem.

690 Feminism and the Politics of Literary Theory
(also German Literature 690) Spring. 4 credits.
Open to qualified undergraduates with permission of
instructor. Reading knowledge of German
recommended but not required.
This course is designed to explore developments in
feminist literary theory with particular attention to
the field of German literature. We will consider competing
critical strategies and their political implications by
working through different readings of specific literary
texts and by raising questions about the implications for
feminism of competing critical strategies in the general
field of literary theory; the relations between feminism
and established critical schools; the tension in feminist
Germanic studies, between critical attention to the "male
canon" and the construction of a female literary
tradition; the impact on West and East German
feminism(s) of their translations of French and
American women's work; the impact and treatment of the
Nazi period; the effects of the East-West divide on
development in both Germanies; the impact on feminist
literature and criticism of Third World women in
France; and approaches in West and East Germany
towards imperialism and racism.

IV Related Courses and Seminars

[305 Psychological Anthropology (also
Anthropology 305) Fall. 4 credits. Not offered 1986–87.
B. J. Isbell.]

[329 Race, Gender, and Politics (also
Government 329) Fall. 4 credits. Open to
sophomores and juniors. Limited to 5 students. Not
M. Katzenstein.

357 American Families in Historical Perspective
(also Sociology 359 and Human Development and
Family Studies 359) Spring. 3 credits. Prerequisite:
Human Development and Family Studies 350 or one
200-level social science or history course. Students in
collocated units must register for Women's Studies 357 or
Sociology 359.
T R 10:00–11:15. J. Brumberg.
An introduction to, and overview of, problems and
issues in the historical literature on American families
and the family life cycle. Reading and lectures will
demonstrate the pattern of American family experience
in past time, focusing on class, ethnicity, sex, and
region as important variables. Analysis of the private
world of the family in past time will deal with changing
cultural conceptions of sexuality, sex roles, gender
relations, stages of life, and life events. Students will
be required to do a major research paper on the
history of their family, covering at least two generations
and demonstrating their ability to integrate life-course
development theory, data drawn from the social
sciences, and historical circumstances.

[463 The Repressed Feminine in the Writings of
Marx (also Government 466) Fall. 4 credits. Not
S. Buck-Morss.

761 Readings in Contemporary Social Theory
(also Government 6670) Spring. 4 credits. Hours
to be arranged. S. Buck-Morss.
Issues raised by neo-Marxism, critical theory, post
structuralism, and feminism.

[759 Virginia Woolf (also English 759) Fall.
5 credits. Prerequisite: permission of instructor. Not
S. Siegel.]

Administration

Geoffrey V. Chester, dean
Isaac Kramnick, associate dean
Lynne S. Abel, associate dean
Urban J. DeWinter, associate dean and director of
admissions
Jack W. Lowe, director of finance and administration
Inge Rechenbach, director of development
Gloria C. Altschuler, director of academic advising and
assistant dean for freshmen
Bonnie Buettrner, assistant dean for seniors and career
programs
Beatrice G. Rosenberg, assistant dean for study
abroad, dual degree programs, and fellowships and
scholarships
Janice P Turner, assistant dean for minority affairs and
undergraduate research

Faculty Roster

Abolafia, Mitchell Y, Ph.D., SUNY at Stony Brook. Asst.
Prof., Organizational Behavior/Sociology
Abrams, Meyer H., Ph.D., Harvard U. Class of 1976
Professor of English Emeritus, English
Abrunia, Hector D., Ph.D., U. of North Carolina at
Chapel Hill. Asst. Prof. Chemistry
Adams, Barry B., Ph.D., U. of North Carolina. Prof.,
English
Aht, Frederick M., Ph.D., U. of Texas at Austin. Prof.,
Classics
Albrecht, Andreas C., Ph.D., U. of Washington. Prof.,
Chemistry
Allen, Jeanne, Ph.D., U. of Iowa. Asst. Prof., Theatre
Arts
Allmendinger, Richard W., Ph.D., Stanford U. Asst.
Prof., Geological Sciences
Ambergakar, Vinay, Ph.D., Carnegie Inst. of
Technology. Prof., Physics/LASSP
Armstrong, Archie R., B.S., U. of Texas at Austin. Prof.
Goldwin Smith Professor of Poetry, English
Anderson, Benedict R., Ph.D., Cornell U. Prof.,
Government
Prof., Philosophy
Archer, Richard J., M.A., U. of Missouri at Kansas City.
Asst. Prof., Theatre Arts
Arroyo, Ciriaco M., Ph.D., U. of Munich (Germany).
Emeritus Hillel Professor of Spanish Literature,
Romance Studies/Comparative Literature
Ascher, Robert, Ph.D., U. of California at Los Angeles.
Prof., Anthropology
Ashcroft, Neil W., Ph.D., Cambridge U. (England). Prof.,
Physics/LASSP
Austin, William W., Ph.D., Harvard U. Given Foundation
Professor of Musicology, Music
Babajogo, Ozalp, Ph.D., U. of California at Berkeley.
Asst. Prof., Computer Science
Babiy, Leonard H., Ph.D., Harvard U. Prof., Modern
Languages and Linguistics/Near Eastern Studies
Bachrach, Samuel B., Ph.D., U. of Wisconsin at
Madison. Prof., Industrial and Labor Relations/Sociology
Baird, Barbara, Ph.D., Cornell U. Prof., Chemistry
Barazangi, Muawah, Ph.D., U. of Columbia U.,
Geological Sciences
Bassett, William A., Ph.D., Columbia U. Prof.,
Geological Sciences
Prof., History
Beckwith, Steven W. V., Ph.D., California Inst.
of Technology Assoc. Prof., Astronomy/CRSR
Begley, Tadgh P., Ph.D., California Inst. of
Technology. Asst. Prof., Chemistry
Ben, Dayi J., Ph.D., U. of Michigan. Prof., Psychology
Benn, Sandra L., Ph.D., U. of Michigan. Prof.,
Psychology/Women's Studies
Beneria, Lourdes, Ph.D., Columbia U. Prof. City and
Regional Planning/Women's Studies
Bereaud, Jacques, Doctorat d'Univ., U. of Lille
(France). Prof., Romance Studies
Berkelman, Karl, Ph.D., Cornell U. Prof., Physics/LNSI
Bennal, Ozalp, Ph.D., U. of California at Berkeley.
Assoc. Prof., Government/Near Eastern Studies
Bennstock, Judith, Ph.D., Columbia U. Asst. Prof.,
History of Art
Benten-Israel, Candidate in Physico-Mathematical
Sciences, Roemanian Academy. Prof., Mathematics
Betbe, Hans, Ph.D., U. of Munich (Germany). John
Wendell Anderson Prof. of Physics Emeritus, Physics
Bilardi, Gianfranco, Ph.D., U. of Illinois, Asst. Prof.,
Computer Science
Bird, John M., Ph.D., Tennessee Polytechnic Inst. Prof.,
Geological Sciences
Birmann, Kenneth P., Ph.D., U. of California. Asst. Prof.,
Computer Science
Bishop, Jonathan P., Ph.D., Harvard U. Prof., English
Bitman, Dina, Ph.D., U. of Wisconsin at Madison. Asst.
Prof., Computer Science
Blackall, Eric A., Prof., Cambridge U. (England).
Jacobo Gould Schumacher Professor of German
Literature Emeritus, German Literature
Blackall, Jean F., Ph.D., University of Chicago. Prof.
English
Block, Richard, M.F.A., Northwestern U. Prof.,
Theatre Arts
Bloom, Arthur L., Ph.D., Yale U. Prof., Geological
Sciences
Blum, Stuart M., Ph.D., U. of Pennsylvania. Prof.,
History
Bogel, Fredric V., Ph.D., Yale U. Prof., English
Boon, James A., Ph.D., U. of Chicago. Prof.,
Anthropology/Comparative Literature
Bowers, John S., Ph.D., Massachusetts Inst. of
Technology. Prof., Modern Languages and
Linguistics
Faculty Roster 239

Goldfield, Michael, Ph.D., U. of Chicago. Asst. Prof., Government
Goftfried, Kurt, Ph.D., Massachusetts Inst. of Technology. Prof., Physics/LNS1
Graham, Patricia, Ph.D., U. of Kansas. Asst. Prof., History of Art
Green, Leonard, Ph.D., Cornell U. Asst. Prof., English
Greenhouse, Carol J., Ph.D., Harvard U. Assoc. Prof., Anthropology
Gregory, Stephen, Ph.D., U. of Waterloo. Asst. Prof., Physics/LNS1
Greig, Kenneth I., Ph.D., Cornell U. Prof., Emeritus, Mathematics
Gries, David J., Ph.D., Technische Hoch., München (Germany). Prof., Computer Science
Grimes, Joseph E., Ph.D., Cornell U. Prof., Modern Languages and Linguistics
Groos, Arthur, Ph.D., Cornell U. Prof., German Literature/ Medieval Studies
Groos, Leonard, Ph.D., U. of Chicago. Prof., Mathematik
Gross, Robert F., Ph.D., U. of North Carolina at Chapel Hill. Asst. Prof., Theatrical Arts
Gross, Robert E., Ph.D., U. of North Carolina. Prof., Chemistry
Gross, Leonard, Ph.D., U. of Chicago. Prof., History
Grout, Donald J., Ph.D., Harvard U. Prof., Emeritus, Mathematics
Guckenheimer, John, Ph.D., University of California at Berkeley. Prof., Mathematics
Gunn, Edward M., Jr., Ph.D., Columbia U. Assoc. Prof., Modern English
Guggenheim, Smith Professor of Comparative Literature and Romance Studies, Romance Studies
Grout, Donald J., Ph.D., Harvard U. Prof., Emeritus, Mathematics
Guy, Gregory R., Ph.D., U. of Pennsylvania. Asst. Prof., Modern Languages and Linguistics
Hagfors, Tor, Ph.D., U. of Oslo (Norway). Prof., Astronomy/Engineering/NAIC
Halpern, Bruce P., Ph.D., Brown U. Prof., Psychology/ Biological Sciences
Hammes, Gordon G., Ph.D., U. of Wisconsin. Horace White Professor of Chemistry and Biochemistry.
Hand, Louis N., Ph.D., Stanford U. Prof., Chemistry/LNS1
Hand, Michael T., Ph.D., U. of North Carolina. Henry Scarbrough Professor of Social Sciences, Sociology
Hart, Wayne E., Ph.D., U. of Illinois. Assoc. Prof., Modern Languages and Linguistics
Harlitt, Donald C., Calif. Inst. of Technology Prof., Physics/LNS1
Hartman, Paul L., Ph.D., Cornell U. Prof., Emeritus, Physics/ Applied and Engineering Physics/LNS1
Hartmanis, J. David, Calif. Inst. of Technology. Prof., Engineering/NAIC
Harwell, Allen, Ph.D., Stanford U. Prof., Mathematics
Hay, George A., Ph.D., Northwestern U. Prof., Economics/Law
Hayes, Donald P., Ph.D., U. of Washington. Prof., Sociology
Haynes, Martha P., Ph.D., Indiana U. Assoc. Prof., Astronomy/NAIC
Hay, Michael J., Ph.D., U. of Minnesota. Assoc. Prof., Theatre Arts
Henderson, David W., Ph.D., U. of Wisconsin. Prof., Mathematics
Henderson, Leonard S., Ph.D., Yale U. Assoc. Prof., Anthropology
Herrin, W. Lamar, Ph.D., U. of Cincinnati. Assoc., Prof., English
Herter, Barry L., Ph.D., U. of Rochester. Asst. Prof., Astronomy/CRSR
Hildebrand, George H., Ph.D., Cornell U. Maxwell M. Upson Professor of Economics and Industrial Relations. Emeritus, Economics/Industrial and Labor Relations
Hill, Thomas D., Ph.D., Cornell U. Prof., English/ Medieval Studies
Hirschman, Charles, Ph.D., U. of Wisconsin. Prof., Sociology
Hite, Molly Ph.D., U. of Washington. Asst. Prof., English
Ho, Wilson, Ph.D., U. of Pennsylvania. Asst. Prof., Physics/LNS1
Hodes, Harold, Ph.D., Harvard U. Assoc. Prof., Romance Studies
Hoffmann, Roald, Ph.D., Harvard U. John A. Newman Professor of Physical Science, Chemistry
Hohendra, Peter U., Ph.D., Hamburg U. (Germany). Jacob Gould Schurman Professor, German Literature/Comparative Literature
Holcomb, Donald F., Ph.D., U. of Illinois. Prof, Physics/LNS1
Hofheinz, W. Robert, Ph.D., Yale U. Frederic J. Whitson Professor of Liberal Studies, Comparative Literature/Romance Studies
Holloway, Thomas H., Ph.D., U. of Wisconsin. Assoc. Prof., History
Holmberg, David H., Ph.D., Cornell U. Asst. Prof., Anthropology/Women's Studies
Holmes, Clive A., Ph.D., Cambridge U. (England). Prof., History
Hopcroft, John E., Ph.D., Stanford U. Joseph C. Ford Professor of Computer Science, Computer Science
Houck, James R., Ph.D., Cornell U. Prof., Astronomy/CRSR
Houston, Paul L., Ph.D., Massachusetts Inst. of Technology. Prof., Chemistry
Hsia, Ronnie Po-chia, Ph.D., Yale U. Asst. Prof., History
Hsu, John T., Ph.D., Old Dominion Foundation Professor of Humanities and Music
Huang, C. T. James, Ph.D., Massachusetts Inst. of Technology. Prof., Modern Languages and Linguistics
Hubbard, John H., Doctorat d'Etat U. de Paris (France). Prof., Mathematics
Huffman, Franklin E., Ph.D., Cornell U. Prof., Modern Languages and Linguistics
Hull, Isabel V., Ph.D., Yale U. Assoc. Prof., History
Husich, David G., Ph.D., Columbia U. Prof., Geological Sciences
Isard, Walter, Ph.D., Harvard U. Prof., Economics
Isbell, Billie J., Ph.D., U. of Illinois. Assoc. Prof., Anthropology
Isaacson, Jay H., Ph.D., Harvard U. Prof., Modern Languages and Linguistics
John, James J., Ph.D., U. of Notre Dame. Professor of Paleography and Medieval History, History
Johnston, Robert E., Ph.D., Rockefeller U. Assoc. Prof., Psychology
Jordan, Teresa J., Ph.D., Stanford U. Asst. Prof., Geophysical Sciences
Jovanovic, Elena, Ph.D., Yale U. Mary Donlon Alger Professor of Economics and Industrial Relations, Economics
Kahn, Alfred E., Ph.D., Yale U. Robert Julius Thorne Professor of Political Economy, Economics
Kahn, Helen, Ph.D., Harvard U. Prof., Emeritus, Sociology
Kalin, T. John, Ph.D., Yale U. Robert Julius Thorne Professor of Political Economy, Economics
Kaplan, Steven L., Ph.D., Yale U. Prof., History
Kering, Daniel E., Ph.D., U. of California at San Diego. Prof., History
Kapustin, Andrew, Ph.D., Cornell U. Prof., Computer Science/Electrical Engineering
Kashe, Carol V., Ph.D., Johns Hopkins U. Assoc. Prof., English
Kaske, Robert E., Ph.D., U. of North Carolina. Avalon Foundation Professor in the Humanities, English
Katz, Steven T., Ph.D., Cambridge U. (England). Prof., History and Religion (Near Eastern Studies)
Katzenstein, Mary F., Ph.D., Massachusetts Inst. of Technology. Assoc. Prof., Government
Katzenstein, Peter J., Ph.D., Harvard U. Prof., Government
Kaufman, Sidney Ph.D., Cornell U. Acting Prof., Geologische Sciences
Kelley, E. Wood, Ph.D., Indiana U. Prof., Government
Kelley, Gerald B., Ph.D., U. of Wisconsin. Prof., Modern Languages and Literatures
Kennedy, William J., Ph.D., Yale U. Prof., Comparative Literature
Kerr, Mark, Ph.D., U. of Chicago. Asst. Prof., Government
Kesten, Harry, Ph.D., Cornell U. Prof., Mathematics
Kiefer, Nicholas M., Ph.D., Princeton U. Prof., Economics
Kingsbury, Paul F., Ph.D., U. of Chicago. Asst. Prof., Government
Kingston, John C., Ph.D., U. of California at Berkeley. Asst. Prof., Modern Languages and Linguistics
Kishida, Tochiro, Ph.D., Tokyo U. (Japan). Prof., Physics/LNS1
Kirkwood, Richard G., Associate Prof., University of Pennsylvania. Prof., Psychology
Kisch, A. Thomas, Ph.D., Harvard U. Prof., Anthropology
Klein, Richard J., Ph.D., Yale U. Assoc. Prof., Romance Studies
Knapik, Anthony W., Ph.D., Princeton U. Prof., Anthropology
Koschmann, J. Victor, Ph.D., U. of Chicago. Assoc. Prof., History
Kozol, Matha, Ph.D., Cornell U. Assoc. Prof., Computer Science
Kramnick, Isaac, Ph.D., Harvard U. Richard E. Schwarz Professor of Government, Government
Kroetzmann, Norman, Ph.D., Johns Hopkins U. Susan Linn Sage Professor of Philosophy, Philosophy
Krevis, Nita, Ph.D., Princeton U. Prof., Classics
Kronik, John W., Ph.D., U. of Wisconsin. Prof., Romance Studies
Krumhansl, Carol L., Ph.D., Stanford U. Assoc. Prof., Psychology
Krumhansl, James A., Ph.D., Cornell U. Horace White Professor of Physics. Emeritus, Psychology
Kufner, Herbert L., Ph.D., Cornell U. Prof., Modern Languages and Linguistics
Kuki, Atsyo, Ph.D., Stanford U. Prof., Chemistry
Kurtzman, H., Ph.D., Massachusetts Inst. of Technology. Asst. Prof., Philosophy
LaCapra, Dominick C., Ph.D., Harvard U. Prof., History
Lambert, Benard, Ph.D., U. of California at Berkeley. Prof., Anthropology
Lambert, William W., Ph.D., Harvard U. Prof., Psychology/Sociology/Anthropology
Lala, Krishna, Ph.D., U. of Michigan. Assoc. Prof., Anthropology
Lawler, Margaret M. A. San Jose State Coll. Assoc. Prof., Theatre Arts
Lazzaro, Crisella, Ph.D., Princeton U. Assoc. Prof., History of Art
Leavitt, Thomas W., Ph.D., Harvard U. Prof., History of Art
Lebow, Richard N., Ph.D., City U. of New York. Prof., Government
Lee, David M., Ph.D., Yale U. Prof., Physics/LNS1
Leed, Richard L., Ph.D., Cornell U. Prof., Modern Languages and Literatures
LePage, G. Peter, Ph.D., Stanford U. Assoc. Prof., Physics/LNS1
Levin, Harry Ph.D., U. of Michigan. William R. Kenan, Jr., Professor of Psychology/Psychology
Levitsky, David A, Ph.D., Rutgers U. Assoc. Prof., Nutritional Sciences/Psychology
Levit, Bruce, Ph.D., U. of Michigan. Prof., Theatre Arts
Levy, Charles S, Ph.D., English
Lewis, Philip E, Ph.D., Yale U. Prof., Romance Studies
Lichtenbaum, Stephen, Ph.D., Harvard U. Prof., Mathematics
 Livesay, George R, Ph.D., U. of Illinois. Prof., Mathematics
 Long, Franklin A, Ph.D., U. of California at Berkeley. Henry R. Luce Professor of Science and Society Emeritus, Chemistry/Science, Technology, and Society
Lowi, Theodore J, Ph.D., Yale John L. Senior Professor of American Institutions, Government
Lurie, Alison A, Ph.D., Radcliffe Coll. Prof., English
Lynch, Thomas F, Ph.D., U. of Chicago. Prof., Anthropology
Lyons, David B, Ph.D., Harvard U. Prof., Philosophy/Law
Maas, James B, Ph.D., Cornell U. Prof., Psychology
McCay, Dan E, Ph.D., Columbia U. Prof., English
McClane, Kenneth A., M.A, Cornell U. Assoc. Prof., English
McClintock, Peter D, Ph.D., Harvard U. Prof., Economics
McConkey, James R, Ph.D., State U. of Iowa. Prof., English
McConnell-Ginet, Sally Ph.D., U. of Rochester. Assoc. Prof., Sociology
McDaid, Boyce D, Ph.D., Cornell U. Floyd R. Newman Chair, Studies in History of Art
Majumdar, Mukul K, Ph.D., U. of California at Berkeley. H. T. Warshow and Robert Irving Warshow Professor of Modern Languages and Literatures
March, Kathryn S, Ph.D., Cornell U. Prof., Anthropology/Women's Studies
Marcham, Frederick G, Ph.D., Cornell U. Goldwin H. T. Warshow and Robert Irving Warshow Professor of Economics, Economics
Masson, Robert T, Ph.D., U. of California at Berkeley. Prof., Economics
Mei, Tsu-Lin, Ph.D., Yale U. Prof., Chinese Literature and Philosophy (Asian Studies)
Meinwald, Jerold G, Ph.D., Harvard U. Goldwin Smith Professor of English History Emeritus, History
Marcus, Philip L, Ph.D., Harvard U. Prof., English
Martin, C. A, Ph.D., University of Wisconsin at Madison. Asst. Prof., German Literature/Women's Studies
Masson, Robert T, Ph.D., U. of California at Berkeley. Prof., Economics
McLafferty, Fred W, Ph.D., Cornell U. Prof., Chemistry
McMillin, H. Scott, Ph.D., Stanford U. Prof., English
McMurry, John E, Ph.D., Columbia U. Prof., Chemistry
McTigue, Stella M.A, Yale U. Instructor, Government
Majumdar, Mukul K, Ph.D., U. of California at Berkeley. H. T. Warshow and Robert Irving Warshow Professor of Modern Languages and Literatures
Palmer, Robert M, M.M, Eastman School of Music. Given Foundation Professor of Music Composition Emeritus, Music
Panagadgen, Prakash, Ph.D., U. of Wisconsin at Madison. Asst. Prof., Computer Science
Payne, Lawrence E, Ph.D., Iowa State U. Prof., Mathematics
Pearl, Robert M, M.M, Eastman School of Music. Given Foundation Professor of Music Composition Emeritus, Music
Pepel, T John, Ph.D., Columbia U. Prof., Government
Peterson, Susan B, A.A, Grinnell Coll. Lecturer, Costume Technology
Peterson, Charles A, Ph.D., U. of Washington. Prof., History
Pink, Walter M, Ph.D., Harvard U. Goldwin Smith Professor Emeritus, English
Poe, Robert O, Prof., Rutgers U. Emeritus, Mathematics
Ponomaryov, Irina, Ph.D., Columbia U. Prof., History
Porter, Richard F, Ph.D., U. of California at Berkeley. Prof., Computer Science
Posner, Uri M, Ph.D., Yale U. Assoc. Prof., Economics
Prendergast, Norma, Ph.D., Cornell U. Lecturer, History of Art
Provine, William B, Ph.D., U. of Chicago. Prof., History
Pucci, Pietro, Ph.D., U. of Pisa (Italy). Prof., Classics
Rabin, Jeremy A, Ph.D., Harvard U. Asst. Prof., Government
Radin, Mary A, Ph.D., Columbia U. Prof., English
Ramage, Andrew, Ph.D., Harvard U. Prof., History of Art
Ramsakri, Dinakar, Ph.D., Columbia U. Prof., Mathematics
Randall, Don M, Ph.D., Princeton U. Prof., Music
Randel, Mary G, Ph.D., Harvard U. Assoc. Prof., Romance Studies
Regan, Dennis T, Ph.D., Stanford U. Assoc. Prof., Psychology
Regan, Elizabeth Adkins, Ph.D., U. of Pennsylvania. Assoc. Prof., Psychology/Biological Sciences
Reppy, John D, Ph.D., Yale U. Prof., Physics/LNS
Rhodes, Frank H, T, Ph.D., U. of Birmingham (England). Prof., Geological Sciences
Richardson, Robert P, Ph.D., Duke U. Prof., Physics/LNS
Rivchin, Marilyn A, B.A, Barnard Coll. Lecturer, Film Making
Roe, Albert S, Ph.D., Harvard U. Prof., Emeritus, History of Art
Rosecrance, Richard N, Ph.D., Harvard U. Prof., Comparative Politics, Government
Rosenthal, Bernard C, Ph.D., Cornell U. SocioLoy, Sociology
Rosenberg, Alex, Ph.D., U. of Chicago. Prof., Mathematics
Rosenberg, Edgar, Ph.D., Stanford U. Prof., English/Comparative Literature
Rothaus, Oscar S, Ph.D., Princeton U. Prof., Mathematics
Rubin, Beth A, Ph.D., Indiana U. Assoc. Prof., Sociology
Rubin, David L, Ph.D., U. of Michigan. Prof., Physics/LNS
Russell, Austin M, Ph.D., U. of Chicago. Prof., Government
Ryan, Thomas A, Ph.D., Cornell U. Emeritus, Psychology
Saccamanno, Neil Ph.D., Johns Hopkins U. Prof., English
Sagan, Carl E, Ph.D., U. of Chicago. David C. Duncan Professor in the Physical Sciences, Astronomy/CRSR
Salkind, Edwin E, Ph.D., Birmingham U. (England). James Gilbert White Distinguished Professor in the Physical Sciences, Physics/Astronomy
Salton, Gerard, Ph.D., Harvard U. Prof., Computer Science
Samuels, Shirley, Ph.D., U. of California at Berkeley. Asst. Prof., English
Schrager, Harold A, Ph.D., Duke U. George W and Grace L. Todd Professor of Chemistry, Chemistry
Schneider, Fred B, Ph.D., SUNY at Stony Brook. Assoc. Prof., Computer Science
Schul, Richard E, Ph.D., Brown U. Prof., Economics/Engineering
Schwarz, Daniel R, Ph.D., Brown U. Prof., English
Seltzer, Mark W, Ph.D., U. of California at Berkeley. Asst. Prof., English
Sen, Shankar Ph.D., Harvard U. Prof., Mathematics
Senderovich, Savelly, Ph.D., New York U. Assoc. Prof., Russian Literature, Government
Sethna, James P, Ph.D., Princeton U. Asst. Prof., Physics/LNS*
Division of Biological Sciences

The Division of Biological Sciences provides a unified curriculum for undergraduate majors enrolled in either the College of Agriculture and Life Sciences or the College of Arts and Sciences. Courses in biological sciences are integral to many disciplines and are basic requirements in many schools and colleges at Cornell.

Graduate study in the biological sciences is administered by more than a dozen specialized fields within the Graduate School, as described in the Announcement of the Graduate School.

Organization

The Division of Biological Sciences is composed of six major sections: Biochemistry, Molecular and Cell Biology; Ecology and Systematics; Genetics and Development; Immunology and Behavior; Physiology; Plant Biology; and, in addition, the L. H. Bailey Hortorum and the Shoals Marine Laboratory.

The Division also works closely with faculty advisers. Additional services and resources of the Biology Center include academic advising and career counseling. The center has comfortable areas for study and relaxed atmosphere.

The Shoals Marine Laboratory, a cooperative venture with the University of New Hampshire, is located on Appledore Island in the Gulf of Maine. Its base office in Stimson Hall provides advising and career counseling for students interested in marine sciences and administrators the SEA Semester program for Cornell students pursuing studies at Woods Hole or aboard the schooner.

Distribution Requirement

In the College of Agriculture and Life Sciences, the biological sciences distribution requirement (Group B) is for a minimum of 9 credits, including at least 6 credits of introductory biology satisfied by Biological Sciences 109–110, 105–106, or 101–103 plus 102–104. Advanced placement in biology with a score of 4 or 5 (6 or 8 credits, respectively) satisfies the requirement for introductory biology. The additional credits may be satisfied by any biological sciences courses except Biological Sciences 108 (no longer offered), 152, 200, 201, 202, 205, 206, 301, 302, 304, or 367.

In the College of Arts and Sciences, the biological sciences distribution requirement is for a two-semester introductory biology sequence selected from Biological Sciences 109–110, 105–106, or 101–103 plus 102–104.

In the College of Human Ecology, the natural sciences distribution requirement is for at least 6 credits selected from Biological Sciences 109–110, 105–106, or 101–103. Students who complete specified courses in chemistry or physics. Advanced placement in biology with a score of 4 or 5 (6 or 8 credits, respectively) also satisfies the distribution requirement in the natural sciences.

Note: Biological Sciences 100, offered during the six-week Cornell Summer Session for 7 credits, also satisfies the introductory biology requirement. Students with a score of 4 must fulfill the introductory biology requirement by taking Biological Sciences 101–103 or 102–104. These requirements are available. Students should consult information available in the course office (140 Comstock Hall) and in the Biology Center (320 Stimson Hall) to determine which semester to take to complete the introductory biology requirement. For students in doubt, Biological Sciences 101–103 is advised. These students receive a total of eight introductory biology credits (4 AP credits plus 4 course credits).

2) General chemistry: Chemistry 207–208,* or 215–216,* or 103–104.

3) College mathematics: Mathematics 111 – 112,* 105–106, or 111 – 105. Agriculture and Life Sciences 115 may not be used to fulfill any part of this requirement.

4) Organic chemistry: Chemistry 253 and 251, or 253 and 301, or 357–358 and 251, or 357–358 and 301, or 359–360 and 251, or 359–360 and 301.

5) Physics: Physics 207–208,* or 122–123,* or 101–102. Students registering in Physics 208 are strongly encouraged to complete the optics branch. Those who take Physics 122–123 are advised to complete Physics 214 as well.

6) Genetics: Biological Sciences 281.

7) Biochemistry: Biological Sciences 330 or 331.

*Since modern biology has an important physical and quantitative orientation, students are advised to undertake basic science courses that emphasize this approach. Asterisks in the above list indicate the courses that provide this orientation, but all courses listed are acceptable.
As an alternative to requirements 8 and 9 above, students may choose to complete the Program in flexibility allowed in satisfying these requirements, form a coherent and meaningful unit. Because of the while ensuring that the selected advanced courses help students achieve depth in one area of biology choose a concentration area or the Program in General Biology. The concentration requirements are designed to help students achieve depth in one area of biology while ensuring that the selected advanced courses form a coherent and meaningful unit. Because of the flexibility allowed in satisfying these requirements, students should consult their faculty advisers when choosing appropriate courses in statistics. As an alternative to requirements 8 and 9 above, students may choose to complete the Program in General Biology, outlined below.

Concentration Areas and Requirements

As noted in the list of requirements above, students accepted to the biological sciences major must choose a concentration area or the Program in General Biology. The concentration requirements are designed to help students achieve depth in one area of biology while ensuring that the selected advanced courses form a coherent and meaningful unit. Because of the flexibility allowed in satisfying these requirements, students should consult their faculty advisers. The possible concentration areas are listed below:

1) Animal Physiology and Anatomy: Bio S 274, The Vertebrates; Bio S 316, Cellular Physiology; Bio S 311 and 319, Introductory Animal Physiology; Lectures and Laboratory; and at least one additional course selected from the following: Bio S 312, Histology; The Biology of the Tissues; Bio S 313 and 317, Ecological Animal Physiology; Bio S 385, Developmental Biology; Bio S 389, Embryology; Bio S 458, Mammalian Physiology; Bio S 492, Sensory Function; An Sc 427, Fundamentals of Endocrinology.

2) Biochemistry: Chemistry 300 or 215–216, Quantitative Chemistry, must be taken. One of the following organic chemistry laboratory sequences must also be taken: Chemistry 301–302 or 251–252–302 or 309 or 251–252. In addition, students must take a physical chemistry sequence (Chemistry 389–390 or 287–288) and a biochemistry laboratory course (Bio S 638 or 430 or 630). It is recommended that students take the more rigorous course and physics sequences (Chemistry 357–358 or 359–360 and Physics 207–208) and a third semester of calculus.

Students interested in biochemistry should complete a year of introductory chemistry other than Chemistry 103–104 before the start of their sophomore year. Students are also urged to complete introductory biology in their freshmen year. Students anticipating graduate work in cell biology should consider taking a physical chemistry sequence (Chemistry 389–390 or 287–288).

5) Ecology, Systematics, and Evolution: Bio S 261, General Ecology; Bio S 376, Organic Evolution; and at least two of the following courses or one of the following courses and a 400-level biology course: Bio S 383, Ecological Animal Physiology; Bio S 343, Taxonomy of Vascular Plants; Bio S 455–457, Insect Ecology; Bio S 461, Oceanography; Bio S 462–464, Limnology; Bio S 465, General Ecology; Bio S 466, Systems Ecology; Bio S 471, Mammalogy; Bio S 473, Herpetology; Bio S 475, Ornithology; Bio S 476, Biology of Fishes; Bio S 479, Paleobiology; Bio S 494, Molecular Evolution. Students are encouraged to gain experience in some aspect of field biology through course work at a biological field station or work experience.

6) Genetics and Development: 9 credits, usually selected from the following courses: Bio S 347, Cytogenetics; Bio S 376, 378, 385, Developmental Biology; Bio S 389, Embryology; Bio S 446, Cytogenetics; Bio S 481, Population Genetics; Bio S 482, Genetics and Society; Bio S 483, Molecular Development; Bio S 484, Molecular Evolution; Bio S 485 and 487, Microbial Genetics; Bio S 486, Immunogenetics; Bio S 499, Undergraduate Research in Biology; Bio S 633, Biosynthesis of Macromolecules; Bio S 639, Molecular Biology of the Cell: Inside the Nucleus; Bio S 641, Laboratory in Plant Molecular Biology; Bio S 644, Plant Growth and Development; Bio S 653, Plant Molecular Genetics; An Sc 419, Animal Cytogenetics.

7) Neurobiology and Behavior: The two-semester introductory course sequence, Neurobiology and Behavior I and II (Bio S 221 and 222) with discussion section (4 credits per term), and 9 additional credits, among which must be a course from the neurobiology and behavior offerings. Bio S 420, 498, 499, and 720 may not be used as this neurobiology and behavior course. The remainder of the 9 credits may be in any course (such as physiology, developmental biology, cellular biology, ecology, vertebrate or invertebrate biology, or neurobiology and behavior) approved by the adviser. Courses used to fulfill the concentration requirements may not be counted toward fulfillment of the breadth requirement.

Note: Students who declare the concentration in neurobiology and behavior after taking Bio S 221 or 222 for only 3 credits must complete additional course work in neurobiology and behavior. These students should consult the chairperson of the Section of Neurobiology and Behavior (W119 Seeley G. Mudd Hall) to determine what course(s) to use to make up the deficiency.

8) Independent Option: Special programs for students interested in biophysics, microbiology (College of Arts and Sciences students only), or nutrition are available under this option. In addition, students who want to undertake a course of study not covered by the above concentration areas, special programs, or the Program in General Biology may petition the Division of Biological Sciences Curriculum Committee. Information on independent options and Curriculum Committee petition forms are available in the Office for Academic Affairs, 181 Stimson Hall.

Requirement for Breadth in Biology

To fulfill the requirement for breadth in biology, students must pass a total of two courses outside of their concentration area selected from two of the categories listed below.

Students should consult their faculty advisers, keeping in mind the following rules, when choosing the courses to meet this requirement. A course may not count for breadth if it could be used (even if it is not) to fulfill a concentration requirement (see note below). No course may be used to fulfill the breadth requirement if it is also used to fulfill a concentration requirement. Students may not count two courses for breadth if one course is a prerequisite to the other course. Students concentrating in animal physiology and anatomy: botany; cell biology; ecology, systematics, and evolution; or genetics and development should see the notes following the list of approved breadth courses.


2) Botany: Biological Sciences 241, 242 and 244, 341 and 349, 343, 345, 348, 441, 448, Plant Pathology 309.

3) Cellular Biology: Biological Sciences 305 and 307, 316, 347, 432, Microbiology 290.

4) Developmental Biology: Biological Sciences 385, 389, 483, Animal Science 220.


6) Neurobiology and Behavior: Biological Sciences 221, 222.

Note: Students concentrating in animal physiology and anatomy may not use Biological Sciences 430 to fulfill the breadth requirement. Students concentrating in botany may not use Biological Sciences 347 to fulfill the breadth requirement. Students concentrating in cell biology may not use Biological Sciences 222, 313, 345, or 483 to fulfill the breadth requirement. Students concentrating in ecology, systematics, and evolution may not use Biological Sciences 343 to fulfill the breadth requirement.
Students concentrating in genetics and development may not use Biological Sciences 347, 378, or any course in group (4) to fulfill the breadth requirement.

Program in General Biology

As an alternative to the requirements for a concentration area and for breadth in biology, students may choose to complete the Program in General Biology. These students must fulfill all other requirements for the biological sciences major. In addition, students must complete the following:

1) Ecology (Bio S 261 or 262).
2) Neurobiology and Behavior I or II (Bio S 221 or 222).
3) A physiology course from the following: Bio S 242 and 244, or 341 and 349, Plant Physiology; Bio S 311, Introductory Animal Physiology; Lectures; Bio S 315, Ecological Animal Physiology; Lectures.
4) One course from the following: Bio S 241, Plant Biology; Bio S 244, The Vertebrates; Bio S 343, Taxonomy of Vascular Plants; Bio S 348, Phycology; Entom 212, Insect Biology; Micro 290 and 291, General Microbiology.
5) At least one course offered by the Division of Biological Sciences concentrating on plants. This may be satisfied by a course that also fulfills requirement 3 or 4.
6) At least one course offered by the Division of Biological Sciences with a laboratory. This may be satisfied by a course that also fulfills requirement 3, 4, or 5.
7) A biological sciences course offered for 2 or more credits having as a prerequisite one of the following: Bio S 221, Neurobiology and Behavior I; Bio S 222, Neurobiology and Behavior II; Bio S 241, Plant Biology; Bio S 242 or 341, Plant Physiology; Bio S 261 or 262, Ecology; Bio S 274, The Vertebrates; Bio S 311, Introductory Animal Physiology; Lectures; Bio S 315, Ecological Animal Physiology; Lectures; Bio S 330 or 331, Principles of Biochemistry.

Independent Research and Honors Program

Individual research projects under the direction of a faculty member are encouraged as part of the program of study within a concentration. Applicants for research projects are accepted by the individual faculty members, who take into account students' previous academic accomplishments, interests, and goals and the availability of space and equipment suitable for the proposed project. Students accepted for independent research enroll for credit in Biological Sciences 499 (Undergraduate Research in Biology) with the written permission of the faculty supervisor. Students register for this course in 118 Stimson Hall. Any faculty member in the Division of Biological Sciences may act as a supervisor. Faculty supervisors outside the division are acceptable only if a faculty member of the division agrees to take full responsibility for the quality of the work. Information on faculty research activities and undergraduate research opportunities is available in the Behman Biology Center, G20 Stimson Hall.

Research credits may not be used in completion of the following concentration areas: animal physiology and anatomy; biochemistry; botany; cell biology; and ecology, systematics, and evolution. No more than 4 credits of research may be used in completion of the following concentration areas: genetics and development, and neurobiology and behavior.

The honors program in biological sciences is designed to offer advanced training in laboratory or field research through the performance of original research projects guided by a member of the faculty. Applications for the honors program are available in the Office for Academic Affairs, 118 Stimson Hall, and must be submitted to the Honors Program Committee by the deadline announced early in the senior year. To qualify for the program, students must have been accepted into the biological sciences major, have completed at least 30 credits at Cornell, and have an overall Cornell cumulative grade-point average of at least 3.00. In addition, students must have at least a 3.00 Cornell cumulative grade-point average in all biology, chemistry, mathematics, and physics courses. (Grades earned in courses in other departments that are used to fulfill major requirements are included in this computation.) In addition, candidates must have a faculty member to supervise their research. Any faculty member in the Division of Biological Sciences may act as a supervisor. Students may also work with faculty supervisors outside the division. Students who elect supervisors outside the division must arrange for a faculty member of the division to serve as co-sponsor of the research. The division co-sponsor must agree to meet with the student on a regular basis, to report to the Honors Program Committee on the progress of the work approximately two months before the thesis is due, and to serve as a reviewer of the thesis. An honors candidate usually enrolls for credit in Biological Sciences 499 (Undergraduate Research in Biology) under the direction of the faculty member acting as an honors supervisor, although it is not necessary to do so. Requirements of the honors program include participation in honors research seminars during two semesters, submission of an acceptable honors thesis, completion of all major requirements, and maintenance of the 3.00 Cornell cumulative grade-point average through graduation. Recommendation to the faculty that a candidate graduate with honors is the responsibility of the Honors Program Committee.

Students interested in the honors program should consult their faculty advisers early during their junior year. Students are strongly encouraged to begin their research projects in their junior year, although they are not formally admitted to the honors program until the beginning of their senior year. Details pertaining to thesis due dates, seminars, and other requirements may be obtained from the chairperson of the Honors Program Committee or from the Office for Academic Affairs, 118 Stimson Hall. Information on faculty research activities is available in the Behman Biology Center, G20 Stimson Hall.

Curriculum Committee

Many decisions pertaining to the curriculum, to division-wide requirements, and to concentration and breadth areas are made by the Curriculum Committee of the division. The committee consists of faculty and elected student members and welcomes advice and suggestions from all interested persons.

Advising

Students in need of academic advice are encouraged to consult their advisers, come to the Behman Biology Center (G20 Stimson Hall), or contact the associate director for academic affairs (118 Stimson Hall). Students interested in marine biology should visit the Cornell Marine Programs Office, G14 Stimson Hall.

Students interested in the multidisciplinary program Biology and Society should see “Special Programs and Interdisciplinary Studies,” in the College of Arts and Sciences section of this catalog.

Index of Courses

The middle digits of biological sciences course numbers are used to denote courses in specific areas: 0, general; 1, animal physiology and anatomy; 2 and 9, neurobiology and behavior; 3, biochemistry and cell biology; 4, botany; 6 and 7, ecology, systematics, and evolution; 8, genetics and development. The middle digit 5 is used when all other course numbers in a particular area have already been assigned.

Note: Biological Sciences courses count as Agriculture and Life Sciences credits for students in the College of Agriculture and Life Sciences, and as Arts and Sciences credits for students in the College of Arts and Sciences.

Current and Former Course Numbers
Students design and perform investigations in all of the major areas of biology. A prerequisite exposure is given to basic biological concepts, research methodologies, relevant data-analysis techniques and statistics, instrumentation, and laboratory methods. Research projects include investigative design, data analysis, and communication of investigational results and conclusions.

105–106 Introductory Biology 105, fall; 106, spring. 4 credits each term (or 2 credits for transfer students, with permission of instructor). Enrollment limited to 200 students. Prerequisite: 105 is prerequisite to 106, unless written permission is obtained from instructor. S-U grades optional, with written permission of instructor. May not be taken for credit after Biological Sciences 101–104 or 109–110. No admittance after first week of classes. Fee: $5. Lect, T 9:05; additional study and lab hours to be arranged. First lec of fall term held on Thursday, August 28. J. Calvo, E. R. Loew, C. H. McFadden. Designed primarily for biology majors, preprofessionals, and other students who desire a challenging broad introduction to fundamental concepts of biology. Physiology, anatomy (accompanied by appropriate dissections), and biochemistry are strongly emphasized in the fall semester. Subjects of study in the spring semester are genetics, development, ecology, evolution, behavior, and the diversity of organisms. The course uses an autotutorial format and offers considerable flexibility in scheduling of coursework to accommodate these, students must reserve all 3 days. Evening prelims: fall, Oct. 2 and Nov. 6; spring, oct. 2 and Oct. 30. M. Wachsberg.

109–110 Biological Principles 109, fall; 110, spring. 3 credits each term. Limited to 600 students. Prerequisite: 109 is prerequisite to 110 unless written permission is obtained from instructor and the student has at least 3 credits of college biology. S-U grades optional (not recommended). May not be taken for credit after Biological Sciences 101–104 or 105–106. This course may be used to fulfill the distribution requirement in the Colleges of Agriculture and Life Sciences. Arts and Sciences, and Human Ecology but may not be used as an introductory course for the major in biological sciences. Note that this course may not always satisfy the prerequisite for second- and third-level courses. Students who do not plan to major in biology may take this broad introductory course in modern biology. It is not a course in social biology but addresses itself to the nature and extent of obligations to spatially distant people, future generations, nonhuman animals, and nonliving things (e.g., the ecosystem). The major component of the course deals with the appropriate analysis of the origin and resolution of environmental problems. Topics include individual vs. collective goods, cost-benefit analysis; and the professional–patient relationship (informed consent, confidentiality, and medical paternalism).

201 History of Biology (also Biology and Society 287 and History 287) Fall. 3 credits. Prerequisite: one year of introductory biology S-U grades optional. Lecs, T R 10:10–11:30; W. B. Provine. An examination of the history of biology emphasizing the interaction of biology and culture. Original writings of biologists constitute the bulk of reading assignments. Covers the period from classical antiquity to 1900.


205 Biomedical Ethics (also Biology and Society 205 and Philosophy 245) Fall or spring. 4 credits. Limited to 50 students. Open to sophomores, juniors, and seniors; permission of instructor required for graduate students. Lecs, M W F 1:25; disc, 1 hour each week to be arranged. M. Wachsberg. Critical analysis of the conceptual frameworks in which ethical problems associated with medical practice can be formulated and evaluated. General topics (with sample issues) include basic concepts such as illness, death, autonomy, and personhood (abortion, euthanasia, professional paternalism); the professional–patient relationship (informed consent, confidentiality, and medical paternalism).

206 Environmental Ethics (also Biology and Society 206 and Philosophy 246) Spring. 4 credits. Limited to 50 students. Open to sophomores, juniors, and seniors; permission of instructor required for graduate students. Lecs, M W F 1:25; disc, 1 hour each week to be arranged. M. Wachsberg. Critical analysis of the conceptual frameworks in which policies affecting the environment are formulated and judged. One major component of the course deals with the nature and extent of obligations to spatially distant people, future generations, nonhuman animals, and nonliving things (e.g., the ecosystem). The major component of the course deals with the appropriate analysis of the origin and resolution of environmental problems. Topics include individual vs. collective goods, cost-benefit analysis, and coordination problems.

201 and Philosophy 245) Fall or spring. 4 credits. Limited to 50 students. Open to sophomores, juniors, and seniors; permission of instructor required for graduate students. Lecs, M W F 1:25; disc, 1 hour each week to be arranged. M. Wachsberg. Critical analysis of the conceptual frameworks in which policies affecting the environment are formulated and judged. One major component of the course deals with the nature and extent of obligations to spatially distant people, future generations, nonhuman animals, and nonliving things (e.g., the ecosystem). The major component of the course deals with the appropriate analysis of the origin and resolution of environmental problems. Topics include individual vs. collective goods, cost-benefit analysis, and coordination problems.

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ongoing products of interactions between human biological evolution and cultural change. Nevertheless, numerous attempts to examine evolutionary processes in humans violate key tenets of evolutionary theory. Unwittingly reproducing elements of pre-Darwinian views of human nature. After reviewing the pre-Darwinian context and reading The Origin of Species, the course explores attempted applications of evolutionary analysis to humans and develops a cultural explanation of the persistence of pre-Darwinian elements in many of them.

302 Food, Agriculture, and Society (also Biology and Society 302) Spring. 3 or 4 credits (4 credits with discussion). Limited to 20 students. Prerequisite: an introductory ecology course or permission of instructor. S-U grades optional. Possible fee for course reading materials.

Lec, MWF 11:15; A. Lewis
An introduction to the quantitative principles and techniques that biophysicists use to advance a variety of biological problems. These principles are taught through an integrated discussion of important biological problems such as photosynthesis, protein conformational flexibility as exemplified by O2 binding, metabolic electron transport (electron tunneling) and the physical characteristics of biological membranes, perception (auditory or visual), the structure and dynamics of DNA and RNA, and the impact of molecular biology on biophysical research.

400 Undergraduate Seminar in Biology Fall or spring. Variable credit (1–3 credits assigned for individual seminar offerings). May be repeated for credit. S-U grades optional.

Sem to be arranged by the instructor. From time to time specialized seminars on topics of interest to undergraduates are offered by visiting faculty or faculty from the Sections of Ecology and Systematics, Genetics and Development, or Plant Biology. Topics and instructors are listed in the division’s catalog supplement issued at the beginning of the semester.

406 Biotechnology, Society, and Law (also Biology and Society 406) Spring. 4 credits.

Prerequisites: a course in genetics and a course in biochemistry, or written permission of instructor. Limited to 20 students. S-U grades optional. Possible fee for course reading materials.

Ser, MWF 2:30–4:25; J. M. Fessenden-Raden, M. W. Shaw
Human biotechnologies, with their implied power in areas such as medicine and law, may advance more rapidly than social institutions can productively use and prudently control them. This course explores issues in the use and applications of biotechnology (e.g., DNA fingerprinting, gene therapy, genes as diagnostics). Readings are from science, medicine, law, ethics, and public policy. A research paper is required.

498 Teaching Experience Fall or spring. 1–4 credits. Enrollment limited. Prerequisites: previous enrollment in the course to be taught or equivalent, and written permission of instructor. S-U grades optional, with permission of instructor. Students in the College of Arts and Sciences may not count credits from this course toward the 120 credits required for graduation.

Hours to be arranged by the staff. Designed to give qualified undergraduate students teaching experience through actual involvement in planning and assisting in biology courses. This experience may be undertaken in cooperation with a faculty member or by independently participating in a discussion group, assisting in a biology laboratory, assisting in field biology, or tutoring. Biological sciences courses currently offering such experience include Biological Sciences 105–106, 231, 274, 319, 330, 430, and 475.

499 Undergraduate Research in Biology Fall or spring. Variable credit. Students in the College of Arts and Sciences may not register for more than 6 credits per term with one supervisor or 8 credits per term with more than one supervisor. Prerequisite: written permission of a research supervisor who supervises the work and assigns the grade. Students must register in the Office for Academic Affairs in Stimson 118. Each student must submit an independent study description of the proposed research project during course registration. Special forms for this purpose are available in the college offices.) S-U grades optional.

Any faculty member in the Division of Biological Sciences may act as a supervisor. Faculty supervisors outside the division are acceptable only if a faculty member of the division agrees to serve as cosigner, taking full responsibility for the quality of the work.

Hours to be arranged. Staff.

Practice in planning, conducting, and reporting independent laboratory and library research programs. Research credits may not be used in completion of the following concentration areas: animal physiology and anatomy; biochemistry; botany; cell biology; and ecology, systematics, and evolution. No more than 4 credits of research may be used in completion of the following concentration areas: genetics and development, and neurobiology and behavior.

600 Introduction to Scanning Electron Microscopy Fall or spring, weeks 2–6. 1 credit. Primarily for graduate students but open to seniors when space is available. Limited to 8 students (fall), 12 students (spring). Prerequisite: permission of instructor. S-U grades only.

Lec and lab to be arranged. M. V. Parthasarathy, E. Lawson
A general introduction to the principles and the proper use of the scanning electron microscope. Emphasis is on the observations and methods of preparing biological material for scanning electron microscopy.

603 Transmission Electron Microscopy for Biologists Fall. 3 credits. Primarily for graduate students but open to upperclass students. Limited to 12 students, with preference given to students with research projects requiring electron microscopy.

Prerequisites: either Biological Sciences 333, 347, or equivalent, and written permission of instructor. Registration during course enrollment recommended. S-U grades optional.


Principles of electron microscopy; techniques for electron microscopy such as ultrathin sectioning, negative staining, and metal shadowing; and interpretation of results. A brief introduction to quantitative electron microscopy is also included.

606 Freeze-Fracture Technique Spring, weeks 7–12. 1 credit. Primarily for graduate students. Limited to 8 students. Prerequisites: Biological Sciences 603 or equivalent, and permission of instructor. S-U grades only.

Lec, T 11:15; disc to be arranged; labs, TR 1:25–4:25; M. V. Parthasarathy.

Principles of freeze-fracturing and freeze-substitution techniques, and freezing artifacts and interpretation of images.

608 Advanced Electron Microscopy for Biologists Spring, weeks 10–14. 1 credit. Primarily for graduate students. Limited to 6 students. Prerequisites: Biological Sciences 603 or equivalent. S-U grades only.

Hours to be arranged. M. V. Parthasarathy.

Project in biological ultrastructure.

702 X-Ray Elemental Analysis in Biology Spring, weeks 7–14. 1 credit. Limited to 6 students.

Prerequisites: Biological Sciences 406 or equivalent, and permission of instructor. S-U grades only. Offered alternate years. Not offered 1986-87.

Lec and lab to be arranged. M. V. Parthasarathy, C. Daugherty.

Principles of X-ray elemental analysis are discussed, with special reference to the energy-dispersive system. Emphasis is on qualitative elemental analysis of biological specimens and preparation of material for such analysis. A brief introduction to quantitative elemental analysis is also given.

Animal Physiology and Anatomy

214 Biological Basis of Sex Differences (also Biology and Society 214 and Women's Studies 214) Spring. 3 credits. Prerequisite: one year of introductory biology. S-U grades optional.

Lec, MWF 12:20–1:40; disc to be arranged.

A. G. Power

A multidisciplinary course dealing with the social and environmental impact of food production in the United States and in developing countries. Agroecosystems of various kinds are analyzed from biological, economic, and social perspectives. The impacts of traditional, conventional, and alternative agricultural technologies are critically examined in the context of developed and developing economies. Specific topics include pest management, soil conservation, farm labor, land reform, and international food policy. The relationship between population, food production, and socioeconomic structure is also discussed.

305 Basic Immunology, Lectures (also Veterinary Medicine 316) Fall. 3 credits.

Recommended: basic courses in microbiology, biochemistry, and genetics.

Lec, TR 8:30–9:55. Evening prelims to be arranged.

A survey of modern immunology, with emphasis on the biological functions of the immune response.

307 Basic Immunology, Laboratory (also Veterinary Medicine 316) Fall. 2 credits.

Prerequisite: a course in basic microbiology or permission of instructor. Recommended: concurrent enrollment in Biological Sciences 305.


A series of laboratory exercises selected to illustrate immunological concepts presented in Biological Sciences 305. Exercises are designed to give students experience with the isolation, culture, and identification of bacteria, fungi, and viruses that cause disease in man. Emphasis is on the pathogenic mechanisms of the microbes and the interrelationships that exist between the host and the microbe. Laboratory sessions are involved with the isolation, culture, and identification of the microbes and the further study and demonstration of the disease process through use of laboratory animal models and tissue cultures.

309 Introduction to Biophysics (also Applied and Engineering Physics 306) Fall. 3 credits.

Prerequisite: one year of introductory physics. S-U grades optional.
458 Mammalian Physiology
Spring. 6 credits.
Enrollment limited. Graduate student auditors allowed in lectures. Prerequisite: Biological Sciences 311 or equivalent with permission of instructor.
Lecs, M W F 8; lab, M or W 1:25–4:25; 4 additional hours to be arranged. K. W. Beyenbach and staff. Selected topics in mammalian physiology are discussed in the lecture and concurrently studied in the laboratory. Topics are selected from the following: physiology of excitable and epithelial cell membranes, the autonomic nervous system, the endocrine system, reproductive endocrinology, gastrointestinal physiology, renal physiology, respiratory physiology, and acid-base balance.

615 Nutrition and Physiology of Mineral Elements
(also Veterinary Medicine 759 and Nutritional Sciences 659)
Fall. 2 credits. Prerequisites: courses in basic physiology, intermediate biochemistry, and general nutrition. Offered alternate years.
Lecs, T R 10:10. R. H. Wasserman, R. Schwartz, D. R. Van Campen. Lectures on nutritional aspects and physiological, biochemical, and hormonal relationships of the prominent macroelements and microminerals, with emphasis on recent developments. Information on methodologies of mineral research and the essentiality, requirements, transport, function, homeostasis, internal relationships, and toxicity of various mineral elements.

616 Radioisotopes in Biological Research
(also Veterinary Medicine 750 and Fall. 3 credits.
Prerequisites: courses in animal or plant physiology, or permission of instructor. Offered alternate years.
Lecs, T R 11:15. lab, T 1:25–5. F. W. Lengemann. Lectures and laboratory use of the radioisotope as a tool in biological research. Among the topics covered are the use and detection of beta-emitting isotopes, gamma spectroscopy, Cerenkov counting, neutron activation for radioradiography, and isotope dilution. Emphasis is placed on liquid scintillation counting, double-label experiments, and 13C and 18O as metabolic tracers. Experiments are designed to present basic principles using plants and animals as subject material. This course is acceptable to the Office of Environmental Safety for certification of the student as a radioisotope user at Cornell University.

618 Biological Membranes and Nutrient Transport
(also Veterinary Medicine 752) Spring. 2 credits.
Prerequisites: courses in animal or plant physiology, or permission of instructor. Offered alternate years.
Lecs, T R 11:15. R. H. Wasserman. An introduction to elementary biophysical properties of biological membranes, theoretical aspects of permeability and transport; mechanism of transfer of inorganic and organic substances primarily across epithelial membranes; and characteristics and properties of transporting macromolecules and ion channels.

619 Lipids (also Nutritional Sciences 602) Fall. 2 credits.
Lecs, T R 11:15. A. Bensadoun. Advanced course on biochemical, metabolic, and physiological aspects of lipids. Emphasis is placed on critical analysis of current topics in lipid methodology, lipid absorption, lipoprotein secretion, molecular structure, and catabolism; mechanism of hormonal regulation of lipolysis and fatty acid synthesis; and cholesterol metabolism and atherosclerosis.

[855 Molecular Mechanisms of Hormone Action
(also Veterinary Medicine 758) Spring. 2 credits.
Related Courses in Other Departments

Adaptations of Marine Organisms (Biological Sciences 413)

Advanced Work in Animal Parasitology (Veterinary Medicine 737)

Animal Development (Veterinary Medicine 507)

Animal Reproduction and Development (Animal Science 220)

Developmental Biology (Biological Sciences 385)

Embryology (Biological Sciences 389)

Fundamentals of Endocrinology (Animal Science 427–428)

Insect Morphology (Entomology 322)

Integration and Coordination of Energy Metabolism (Biological Sciences 637 and Nutritional Sciences 636)

Neuroanatomy (Veterinary Medicine 504)

Sensory Function (Biological Sciences 492)

Teaching Experience (Biological Sciences 498)

Undergraduate Research in Biology (Biological Sciences 499)

Biochemistry, Molecular and Cell Biology

132 Orientation Lectures in Biochemistry Spring, weeks 1–3. No credit. Primarily for freshmen, sophomores, and transfer students. S-U grades optional (registered students receive an unsatisfactory grade for nonattendance).


Lectures illustrate modern research and training in biochemistry and molecular and cell biology.

231 General Biochemistry Fall. 3 credits. Intended for students who have not studied biochemistry previously and who do not expect to pursue it further. Not recommended for students who have taken organic chemistry. Prerequisite: Chemistry 104 or 208 or equivalent. S-U grades optional.


Lectures and discussions. Grades above the C+ level are penalized.

232 Recombinant DNA Technology and Its Applications (also Biology and Society 232) Spring. 2 or 3 credits (3 credits with discussion). Disc limited to 20 students. Prerequisite: one year of introductory biology. S-U grades optional.


An introduction to molecular approaches to biology. Basic concepts underlying recombinant DNA technology together with strategies for cloning genes are discussed. Much of the course deals with applications of recombinant DNA technology to basic research and to biotechnology. Applications to be discussed include screening for genetic diseases; plant improvement; and production of insulin, interferon, blood-clotting factors, growth hormones, vaccines, and feed-stock chemicals. Scientific, historical, regulatory, social, and ethical issues form the basis of the discussions. Recommended especially for sophomores desiring a firm background in recombinant DNA technology in preparation for taking genetics and biochemistry. Also appropriate for the intelligent layperson who wants to understand some new research discoveries and applications stemming from them.

330–331 Principles of Biochemistry Introductory biochemistry is offered in two formats: individualized instruction (330) and lectures (331). Individualized instruction is offered to a maximum of approximately 150 students each semester. Lectures given fall semester only.

330 Principles of Biochemistry, Individualized Instruction Fall or spring. 4 credits (2 credits if taken after Biological Sciences 231). Prerequisite: Chemistry 253 or 358 or equivalent. May not be taken for credit after Biological Sciences 331. Lecture: M W F 8 or 10:10 or to be arranged; additional hours in the Study Center to be arranged. No formal lectures. Preparing for the fall term. Fall: Merger, R. E. McCarthy, and staff; spring: Merger, R. Wu, and staff.

The core material of the course consists of twelve units of work outlined in a study guide written to accompany the textbook. Students prepare the work on their own, with help from the staff of the Study Center if desired. Students must pass a quiz on each unit to obtain a grade of C+ or higher. Students who want to go beyond the core material have available a wide range of electives, including discussions of research papers and independent study of selected problems and monographs. Grades above the C+ level are penalized. The amount of elective work satisfactorily completed and by the midterm and final exams. Mised deadlines or very poor exam scores result in grade penalties.

331 Principles of Biochemistry, Lectures Fall or spring. 6-week summer session. 4 credits (or 2 credits if taken after Biological Sciences 231). Enrollment may be limited to 400 students. Prerequisite: Chemistry 253 or 358 or equivalent. May not be taken for credit after Biological Sciences 330. Lec: M W F S 10:10. J. K. Moffatt, P. C. Hinkle, B. K. Ty.

Chemistry of biological substances, presented in lecture format. Course content is similar to that of Biological Sciences 330.

430 Basic Biochemical Methods Fall or spring. 4 credits. Enrollment limited. Prerequisites: Biological Sciences 330 or 331, organic chemistry lectures and laboratories, and permission of instructor obtained by preregistration in Stimson 529. Concurrent registration in Biological Sciences 330 or 331 may be arranged in the fall term for graduate students. Lec: F 1:25. labs, M W or T R 12:20–4:25. R. R. Alexander, J. M. Griffiths.

A laboratory course designed to introduce students to the biochemical techniques commonly used in the study of biological materials. Students work in small groups, and each student rotates among four modules, including two of the student's own choice. Various assay methods, column chromatography, electrophoresis, and use of the scintillation counter are taught. Each experiment is taken by all students. Methods used in the clinical laboratory are applied to analyses of blood and urine samples, and some nutritional analyses are done for protein and vitamin contents of foods. In the cell component unit, procedures of cell fractionation are introduced and the unique functions of various organelles are examined. In the nucleic acid module, students are introduced to recombinant-DNA methodology, isolating DNA and studying the function of transfer RNA. The lipid module includes isolation and purification procedures, thin-layer chromatography, and cholesterol and phosphate analyses.

432 Survey of Cell Biology Spring. 3 credits. Prerequisite: Biological Sciences 330 or 331 or equivalent.

Lecs: M W F 11:15. W. J. Brown and staff.

A survey of a wide array of topics focusing on eucaryotes. The topics include microscopic...
techniques, membrane structures and functions, cell-to-cell communication, functions and interactions of cell organelles, the cytoskeleton, cell movement, chromosome structure, the control of gene expression and cellular differentiation, cell division, oncogenes, and cells of the immune system. The material is covered in depth in Biological Sciences 438, 493, 632, and 636.

435–436 Undergraduate Biochemistry Seminar

435: Fall, 436: Spring. 1 credit each term. May be repeated for credit. Limited to upperclass students. Prerequisite: Biological Sciences 330 or 331 or permission of instructor. S-U grades optional. Fall limited to 12 students. S-U grades optional. Offered alternate years.

436 Laboratory in Cell Biology

Spring. 4 credits. Enrollment limited. Prerequisites: a course in biochemistry or cell biology, and permission of instructor obtained by registering in Wing 309.

437 Integration and Coordination of Energy Metabolism (also Nutritional Sciences 636)

Fall. 2 credits. Prerequisite: Biological Sciences 330 or 331 or equivalent. Mav be repeated for credit. Limited to 12 students. S-U grades optional. Offered alternate years.

438 Cell Proliferation and Oncogenic Viruses (also Toxicology 610)

Fall. 3 credits. Prerequisites: Introduction to biochemistry, physical chemistry, and organic chemistry or permission of instructor S-U grades optional. Fall limited to 24 students. S-U grades optional. Offered alternate years.

439 Mechanisms of Metabolic Regulation (also Nutritional Sciences 635)

Spring. 2 credits. Prerequisite: Biological Sciences 330 or 331 and either Chemistry 358 or 360, or permission of instructor. Offered alternate years. Not offered 1986–87.

440 Biokinetics

Fall. 2 credits. Prerequisites: Biokinetics 440 or 441 and Biochemistry 442. Offered alternate years. Not offered 1986–87.

441 Biokinetics Seminar

Fall. 2 credits. Prerequisite: Concurrent registration in Toxicology 610 or permission of instructor. Limited to 24 students. S-U grades optional. Offered alternate years.

442 Plant Biochemistry

Spring. 3 credits. Prerequisites: organic chemistry, biochemistry, and in course and Biological Sciences 632 and 636 provide broad coverage of the cell biology subject area.

630 Laboratory in Cell Biology

Spring. 4 credits. Enrollment limited. Prerequisites: a course in biochemistry or cell biology, and permission of instructor obtained by registering in Wing 309.

Labs, M W 1:25–4:25 or T or R 9:05–4:25; disc to be arranged. J. Gibson and staff. Lectures emphasize techniques for handling and experimenting with cells of different kinds and provides experience in experimental design.

631 Protein Structure and Function

Fall. 2 or 3 credits (3 credits with discussion). Prerequisites: introductory biochemistry, physical chemistry, and organic chemistry or permission of instructor S-U grades optional. Fall limited to 12 students. S-U grades optional. Offered alternate years.

632 Membranes and Bioenergetics

Spring. 2 credits. Prerequisite: Biological Sciences 330 or 331 or equivalent. Offered alternate years. Not offered 1986–87.

Lecs, T R 11:15, P. C. Hinkle.

Structure of biological membranes, model membrane systems, receptors, ion-transport enzymes, oxidative phosphorylation, and photophosphorylation. Together with Biological Sciences 632 and 636, this course provides broad coverage of the cell biology subject area.

633 Biosynthesis of Macromolecules

Fall. 2 or 3 credits (3 credits with discussion and permission of instructor). Disc limited to 15 students. Prerequisite: Biological Sciences 330 or 331. Recommended: Biological Sciences 281.


634 Biochemistry of the Vitamins and Coenzymes (also Nutritional Sciences 634)

Spring. 2 credits. Prerequisites: Biological Sciences 330 or 331 or equivalent and either Chemistry 358 or 360. Offered alternate years. Not offered 1986–87.


The chemical, biochemical, and nutritional aspects of the vitamins and coenzymes.

635 Mechanisms of Metabolic Regulation (also Nutritional Sciences 635)

Spring. 2 credits. Prerequisites: Biological Sciences 330 or 331 and either Chemistry 358 or 360, or permission of instructor. Offered alternate years. Not offered 1986–87.


Lectures on the identification and characterization of regulatory steps in metabolism, considered from both theoretical and practical aspects. The intracellular mechanisms of regulation are hypothesized, with specific examples in mammalian metabolism examined in detail.

636 Molecular Biology of the Cell: Outside the Nucleus

Spring. 2 credits. Prerequisite: Biological Sciences 330 or 331 or equivalent.


Lectures covering current topics in cell biology, including a detailed discussion of secretion, endocytosis, membrane-bound organelles, membrane recycling, the cytoskeleton, cell motility, junctions, the cell cycle, and related topics. Lectures on selected modern techniques in cell biology are also included. Together with Biological Sciences 632 and 639, this course provides broad coverage of the cell biology subject area.

637 Integration and Coordination of Energy Metabolism (also Nutritional Sciences 636)

Fall. 3 credits. Prerequisite: Biological Sciences 330 or 331 or equivalent. Mav be repeated for credit. Limited to 12 students. S-U grades optional. Offered alternate years.

W. J. Aroon.

The elements and dynamics of energy metabolism in higher animals are developed systematically through biochemical characterizations of the metabolic components and structure of major tissues and organs. Emphasis is placed on correlations with physiologic functions. Mechanisms that control energy metabolism within individual tissues and coordinate these processes in the intact animal are analyzed in the context of selected physiologic and pathologic stresses.

638 Intermediate Biochemical Methods

Fall or spring. 4 credits. Primarily for graduate students minoring in biochemistry and undergraduates concentrating in biochemical science. Enrollment limited to 24 students in the fall and 48 students in the spring. Admission to the course is dependent upon the results of a personal interview with the instructor, which must be held before the first day of classes. There is no admission to the course without the interview. Undergraduates are urged to interview during preregistration. May not be taken for credit after Biological Sciences 436.

Labs, M W 9:05–4:25 (fall); lab, T or R 9:05–4:25 (spring). D. B. Wilson and staff.

Selected experiments on proteins, enzymes, DNA, and bioenergetics to illustrate basic biochemical properties. The chemical, biochemical, and nutritional aspects of the vitamins and coenzymes.

639 Molecular Biology of the Cell: Inside the Nucleus

Spring. 2 credits. Prerequisite: Biological Sciences 330 or 331 or equivalent. Recommended: Biological Sciences 281.

Lecs, M W 9–1:25 P. M. J. T. Liss.

Lectures on topics in eukaryotic gene organization, regulation of gene expression, RNA processing, chromatin structure, the structure and movement of chromosomes, and the architecture of the nucleus. This course and Biological Sciences 632 and 636 provide broad coverage of the cell biology subject area.

640 Plant Biochemistry

Spring. 3 credits. Prerequisites: organic chemistry, biochemistry, and a course in plant physiology. Offered alternate years.


Selected topics in plant biochemistry are reviewed in the context of the plant life cycle and responses to the environment. Topics include metabolism of lipids, carbohydrates, organic acids, and proteins; nitrogen and sulfur assimilation; respiration; photosynthesis; development and replication of chloroplasts; and cell-wall composition and properties. Attention is paid to operation of control mechanisms.

650 Nitrogen Metabolism (also Nutritional Sciences 633)

Spring. 2 credits. Prerequisites: Biological Sciences 330 or 331 and Chemistry 358 or 360. Offered alternate years.


A coverage of most aspects of nitrogen metabolism. The first section of the course deals with nitrogen fixation and assimilation, and the metabolism and biologic importance of purines, pyrimidines, porphyrins, alkaloids, and amines. This is followed by discussion of the pathways of amino acid biosynthesis and degradation. The final section includes discussion of protein turnover and degradation, nitrogen excretion, and interorgan relationships in high protein diets. Emphasis throughout the course is on hormonal, developmental, and molecular biological aspects of metabolic regulation and evolutionary differences.

659 Risk Management of Toxic Chemicals (also Biology and Society 459 and Toxicology 659)

Fall. 2 or 3 credits (3 credits with major research paper). Prerequisite: concurrent registration in Toxicology 610 or permission of instructor. Limited to 12 students. S-U grades optional. Offered alternate years.


Selected cases of chemical risk communication and risk management by government agencies, communities, industries, and individuals are reviewed. Potential topics include toxic wastes, groundwater contamination, chemical accidents, and occupational and community right-to-know. The roles of social, economic, political, legal, and ethical factors in decision making are discussed. Readings from the various disciplines, as well as scientific reports, provide background for class discussions.

731–736 Current Topics in Biochemistry

Fall or spring. ½ or 1 credit for each topic. May be repeated for credit. Students registered for ½ credit should not fill in the credit-hour column on the optical-mark registration form; the computer is programmed to register students automatically for ½ credit. Prerequisite: Biological Sciences 330 or 331 or equivalent. S-U grades only. Lectures and seminars on specialized topics.

Fall 1986: three topics are offered.

731 Normal Morphology of Viral Oncogenes

½ credit.


733 Membrane Receptor Dynamics

½ credit.


735 Recent Advances in Recombinant DNA Methods

½ credit.


732 Fluorescence Spectroscopy for Biologists

½ credit.


734 Mechanisms of Ligand Binding to Hemoproteins

½ credit.


736 Topics in Genetic Regulation

½ credit.

Botany

241 Plant Biology Fall. Fall. 3 credits. Enrollment may be limited, with preference given to sophomores and juniors majoring in agronomy, botany, environmental education, floriculture, horticulture, natural resources, plant sciences, vegetables, crops, and wildlife. Prerequisites: one year of introductory biology for majors or equivalent. Lecs, T 9:05; labs, M, T 2:15—4:25, or M or W 7:30—10:30 p.m. Evening prelms: Oct. 16 and Dec. 4. K. J. Nakita.

242 Plant Physiology, Lectures Spring. 3 credits. Primarily for undergraduates in agricultural sciences. Prerequisites: one year of introductory biology and introductory chemistry, and concurrent enrollment in Biological Sciences 244 (not required of graduate students). May not be taken for credit after Biological Sciences 341. Experiments exemplify concepts covered in Biological Sciences 242 and offer experience in a variety of biological and biochemical techniques, including use of small amounts of radioisotopes.


245 Plant Anatomy Fall. 4 credits. Limited to 48 students. Prerequisite: one year of introductory biology or a semester of botany. Lecs, M, W 9:05; labs, M, W 2—4:25 or T 10:10—12:35. Staff. A study primarily of the structure of cells and their components and the relation of these to function and heredity. Special attention is given to chromosomes. Both plant and animal materials are used.

246 Plants and Civilization Fall. 4 credits. Prerequisites: one year of introductory biology or majors. Recommended: Biological Sciences 281. Not offered 1986–87. Lecs, M, W 9:05; labs, M, W or T R 10:10—12:35. Staff. An introduction to freshwater and marine algae, including consideration of their ecology as members of the plankton and benthos and their importance to man. The laboratory uses field material and cultures to illustrate lecture topics, provide familiarity with algae in the field, and introduce the student to techniques used to study algae in the laboratory. An optional extended field trip to coastal waters may be arranged as part of this course.

247 Cytology Fall. 4 credits. Prerequisites: one year of introductory biology or majors. Recommended: Biological Sciences 281. Not offered 1986–87. Lecs, M, W 9:05; labs, M, W or T R 10:10—12:35. Staff. A study primarily of the structure of cells and their components and the relation of these to function and heredity. Special attention is given to chromosomes. Both plant and animal materials are used.

248 Phycology Fall. 3 credits. Prerequisites: one year of introductory biology or majors. Recommended: Biological Sciences 281. Not offered 1986–87. Lecs, M, W 9:05; labs, M, W or T R 10:10—12:35. Staff. An introduction to freshwater and marine algae, including consideration of their ecology as members of the plankton and benthos and their importance to man. The laboratory uses field material and cultures to illustrate lecture topics, provide familiarity with algae in the field, and introduce the student to techniques used to study algae in the laboratory. An optional extended field trip to coastal waters may be arranged as part of this course.

249 Plant Physiology, Laboratory Fall. 2 credits. Prerequisites: one year of introductory biology or majors. Recommended: Biological Sciences 281. Not offered 1986–87. Lecs, M, W 9:05; labs, M, W or T R 10:10—12:35. Staff. A study primarily of the structure of cells and their components and the relation of these to function and heredity. Special attention is given to chromosomes. Both plant and animal materials are used.

250 Biological Sciences
An integrated study of the systematics and evolution of agronomic and horticultural species. Processes of domestication, the evolutionary history of selected cultivated plants, the nature of weeds and land races, classification, and taxonomy as applied to cultivated plants, and underexploited plant resources are among the topics considered.

[442] Biology of Plant Species
Spring. 2 credits. Prerequisite: Biological Sciences 343 or equivalent. Recommended: Biological Sciences 378 and 463. S-U grades optional, with permission of instructor. Offered alternate years. Not offered 1986–87

Lecs, T R 9:05; lab, W 10:10–1:10 or by arrangement with instructor. N. W. Uhle. The use of anatomy in vascular plants for diagnosis of structure, taxonomic relationships, evolutionary sequences, and ecological adaptations, with emphasis on recent research. The laboratory provides experience in techniques and interpretation.

640 Applied Plant Anatomy
Spring. 3 credits. Prerequisites: Biological Sciences 345 or equivalent, and permission of instructor. Lecs and discs, T R 9:05; lab, W 10:10–1:10 or by arrangement with instructor. N. W. Uhle. The use of anatomy in vascular plants for diagnosis of structure, taxonomic relationships, evolutionary sequences, and ecological adaptations, with emphasis on recent research. The laboratory provides experience in techniques and interpretation.

641 Laboratory in Plant Molecular Biology
Spring. 4 credits. Prerequisites: Biological Sciences 281 or equivalent, 330 or 331 or equivalent, and permission of instructor. S-U grades optional.

Lab. To be arranged. J. B. Nasrallah, M. R. Hanson, S. Tanksley, P. Palukaitis. Selected experiments on genome organization, gene expression, and gene transfer in plants. The course emphasizes the application of molecular biology methodology to plant systems.

642 Plant Mineral Nutrition
Spring. 3 credits. Prerequisite: Biological Sciences 341 or equivalent. Offered alternate years.

Lecs, M W F 10:10, L. V. Kochian. A detailed study of the processes by which plants acquire and use mineral nutrients from the soil. Topics include the uptake, translocation, and compartmentation of mineral elements; root-soil interactions; the metabolism of mineral elements; the involvement of mineral nutrients in various physiological processes; and the nutrition of plants adapted to extreme environmental stresses (e.g., salinity). Specific mineral elements are emphasized to illustrate these topics.

643 Plant Physiology, Advanced Laboratory Techniques
Fall. 3 credits. Primarily for graduate students in the plant sciences. Prerequisites: organic chemistry, biochemistry, and a course in plant physiology. S-U grades optional.


644 Plant Growth and Development
Spring. 3 credits. Prerequisites: Biological Sciences 345 and either 242 or 341 or their equivalents, or written permission of instructor. Offered alternate years. Not offered 1986–87

Lecs, M W F 9:05. P. J. Davies, D. J. Paolillo. Explores the changes that occur during plant growth and development and their control: morphological and anatomical changes in apices, tissue differentiation, organ formation, embryo development, gene regulation, hormone action and interaction, the influence of light in development, flowering, fruiting, dormancy, abscission, and senescence.

645 Families of Tropical Flowering Plants
Fall. 1 credit. Prerequisite: written permission of instructor. S-U grades only. Offered alternate years. Not offered 1986–87

Lecs and disc, F 11:15. D. A. Young. The families of flowering plants encountered solely or chiefly in tropical regions are considered in lectures, discussions, and demonstrations, with the aim of providing basic points of recognition for, and an understanding of, diversity and relationships in these families for the student venturing into the tropics.

646 Families of Tropical Flowering Plants: Field Laboratory
Fall. 3 credits. Limited to 20 students, with preference given to graduate students from other institutions of the Organization for Tropical Studies. Prerequisite: Biological Sciences 342 or 343 or equivalent. Recommended: Biological Sciences 645. S-U grades only. For more details and application, contact the L. H. Bailey Hortorium, 467 Mann Library, Cornell University. Offered alternate years. Not offered 1985–86.

Bailey Hortorium staff. An intensive orientation to families of tropical flowering plants represented in forests of the Americas. Emphasis on field identification combined with laboratory analysis of available materials in a "whole-plant" context.

647 Seminar in Systematic Botany
Spring. 1 credit. May be repeated for credit. Prerequisite: written permission of course coordinator required for undergraduates. S-U grades optional.

Lecs, W 2:30–3:30, J. B. Nasrallah, M. R. Hanson, J. F. Thompson. Selected areas of plant biochemistry are reviewed in the context of the plant life cycle and responses to the environment. Topics include metabolism of lipids, carbohydrates, organic acids, and proteins; nitrogen and sulfur assimilation; respiration; photosynthesis; development and replication of chloroplasts; and cell-wall composition and properties. Attention is paid to operation of control mechanisms.

649 Transport of Solutes and Water in Plants
Fall. 3 credits. Prerequisites: introductory physics, calculus, and plant physiology. S-U grades only. Offered alternate years.

Lecs, M W F 10:10. R. M. Spanswick. Transport of ions, water, and organic materials in plants; mechanisms of ion transport; relationships between ion transport and metabolism; ion uptake and transport in higher plants; phloem transport; and water relations of single cells and whole plants.

651 Quantitative Whole-Plant Physiology
Fall. 3 credits. Offered alternate years. Not offered 1986–87

Lecs, T R 10:10–11:30. D. J. Doyle. An introduction to the methodology of plant systematic research: field studies; sampling and collecting methods; preparation of taxonomic revisions and monographs; numerical methods of data analysis; and laboratory methods in cytotogenetics, comparative anatomy, and comparative chemistry, as applied to problems in plant systematics.

652 Photosynthesis (also Applied and Engineering Botanics 601)
Fall. 3 credits. Prerequisites: Chemistry 104 or 208, Mathematics 105 or 111, and either Physics 102 or 208, or permission of instructor. Offered alternate years.

Lecs, M W F 10:10. L. V. Kochian. A detailed study of the processes by which plants use light in order to grow, physical and physicochemical aspects of the problem are emphasized.

653 Plant Molecular Genetics (also Plant Breeding 600 and Plant Pathology 600)
Fall. 3 credits. Prerequisites: Biological Sciences 281 and 347 or their equivalents. Offered alternate years. Not offered 1986–87.

Lecs, T R 10:10–11:30. J. W. Dooley. The study of variation at the molecular level and its application to the taxonomy and evolution of plants, primarily angiosperms. Both macromolecules—particularly flavonoids—and macromolecules are discussed. Topics include analysis of electrophoretic and sequence variation of proteins, the use of such variation as a phylogenetic tool, and genome organization and evolution. Major emphasis is placed on the impact of dominant DNA technology on plant systematics, with comprehensive treatment of the methods involved. The nuclear, chloroplast, and mitochondrial genomes of plants are treated in detail, with discussion of the use of variation patterns discernible at the restriction-enzyme and DNA-sequence levels. Methods of phylogenetic analysis of molecular data are also covered.

654 Plant Evolution and the Fossil Record
Spring. 3 credits. Prerequisite: Biological Sciences 241 or equivalent or written permission of instructor. Offered alternate years. Not offered 1986–87

Lecs, T R 9:05; lab, R 12:20–2:15. K. J. Niklas. An introduction to evolution, surveying major changes in plants from the origin of life to the present. Emphasis is placed on plant form and function, adaptations to particular ecologic settings, and evolutionary theory as it relates to plants.
Lec and disc; R 10:10. J. W. Ingram. A survey of the basic reference works in taxonomy from the pre-Linnaean literature drawn on by Linnaeus to contemporary publications, with comments on the peculiarities of the books (when appropriate), publication dates, typographic devices, and intricacies of bibliographic citation.

740 Plant Biology Seminar Fall and spring. No credit (no official registration). Required of graduate students doing work in plant biology.
Sem, F 11:15. Staff. Lectures on current research in plant biology, presented by visitors and staff.

749 Graduate Research in Botany Fall or spring. Variable credit. May be repeated for credit. S-U grades optional.
Hrs to be arranged. Staff. Similar to Biological Sciences 499 but intended for graduate students who are working with faculty members on an individual basis.

840 Current Topics in Plant Physiology Fall or spring. 2 credits. May be repeated for credit. S-U grades only.
Sem to be arranged. Staff. Seminar reports by graduate students on current literature in experimental plant physiology or related areas.

Related Courses in Other Departments

Marine Botany: Ecology of Marine Plants (Biological Sciences 449)

Introductory Mycology (Plant Pathology 309)

Mycology (Plant Pathology 709)

Mycology Conferences (Plant Pathology 649)

Plant Ecology, Lectures and Laboratory (Biological Sciences 463 and 465)

Plant Ecology Seminar (Biological Sciences 669)

Taxonomy of Fungi (Plant Pathology 729)

Teaching Experience (Biological Sciences 498)

Undergraduate Research in Biology (Biological Sciences 499)

Ecology, Systematics, and Evolution

261 General Ecology Fall or summer. 3 credits. For students concentrating in ecology or a related subject.
Not open to freshmen. Prerequisite: one year of introductory biology for majors. May not be taken for credit after Biological Sciences 262.
Lecs, T R 9:05; disc, W or R 1:25, 2:30, or 3:35. P P Feeny and staff.

Principles concerning the interactions between organisms and their environment; influence of competition, predation, and other factors on population size and dispersion; analysis of population structure and growth; processes of specialization, interspecific competition and the niche concept; succession and community concepts; influence of climate and past events on the diversity and stability of communities in different regions of the world; and role of energy flow and biogeochemical cycling in determining the structure and productivity of ecosystems. Modern evolutionary theory is emphasized throughout, and attention is given to conflicting ecological hypotheses.

262 Ecology, Environment, and Society Spring. 3 credits. Prerequisite: one year of introductory biology or written permission of instructor. May not be taken for credit after Biological Sciences 261.

An introduction to ecology emphasizing basic principles and their application to current environmental problems. The course deals with both terrestrial and aquatic ecosystems, and examines those that occur at the population, community, and ecosystem levels of organization. The interactions of people with ecosystems are considered, with particular emphasis on agriculture and world hunger, energy and resource use, pollution, and the conservation of species and habitats.

263 Field Ecology Fall. 2 credits. Prerequisite: concurrent or previous enrollment in Biological Sciences 261 or 262. Limited to 20 students.
Field exercises designed to give students direct experience with several topics discussed in the lecture courses, with emphasis on developing observational skills and a landscape perspective. Topics include plant succession, niche relationships of insects, influence of herbivores on plant performance, decomposition of soil litter, sampling plankton, and use of scientific collections.

274 The Vertebrates Spring. 5 credits. Primarily for sophomores: a prerequisite or recommended course for many advanced courses in vertebrate biology, anatomy, and physiology. Each lab limited to 21 students.
Prerequisite: one year of introductory biology for majors. Fee, $10.
Lecs, T R 10:10; labs, M W 1, T 2:50–5 or 7–10 p.m., or T R 1:25–5. Evening prelim. Mar. 12: 3 evening lab practicals to be arranged. T. J. Cade and staff. An introduction to the evolution, classification, comparative anatomy, life history, and behavior of vertebrate animals. Laboratory dissection and demonstration are concerned with structure, classification, systematics, biology of species, and studies of selected aspects of vertebrate life.

275 Human Biology and Evolution Fall. 3 credits. S-U grades optional, with permission of instructor.
An introduction to the biology of Homo sapiens through an examination of human evolution, biological diversity, and modes of adaptation to past and present environments. Evolutionary theory is reviewed in relation to the current evidence from the fossil record and studies of the evolution of human behavior. A survey of human adaptation covers a complex of biological and behavioral responses to environmental stress. Human diversity is examined as the product of long-term evolutionary forces and short-term adaptive responses. Topics such as modernism, the Pliotudon fraud, the sociobiology debate, genetic engineering, race and IQ, and racism are presented as examples of current issues in human biology.

Lecs, M W F 10:10. N. W. McFarland and staff.
An introductory course for students interested in ecology and physiology. The characteristics of the physical environment that are important to organisms are discussed, and representative physiological, behavioral, and morphological adaptations of vertebrate and invertebrate animals to their environments are analyzed.

Lab, W or F 1:25–4:25. W. N. McFarland. Exercises involve measurement of important environmental factors in local habitats, and laboratory experiments to familiarize students with the use of ecophysiological concepts.

[371 Human Paleontology] Fall. 4 credits. Prerequisite: one year of introductory biology or Anthropology 214 or permission of instructor. Offered alternate years. Not offered 1986–87.
Lecs, M W F 2:30. Lab, 1 hr each week to be arranged; occasional field trips. K. A. R. Kennedy.
A broad survey of the fossil evidence for human evolution with special attention to skeletal and dental anatomy, geological contents, paleoecology, dating methods, archaeological associations, and current theories of primate phylogeny.

378 Organic Evolution Spring. 4 credits.
Prerequisite: Biological Sciences 281 or permission of instructor. Recommended: Biological Sciences 261 or 262. S-U grades optional.
Lecs and demonstrations, M W F 10:10, disc, 1 hr each week to be arranged. Staff. Lectures and class discussions on organic evolution, including the origin of life, genetic mechanisms, the properties of populations, the ways in which adaptation and natural selection work, and the resultant major patterns of organic diversity.

[455 Insect Ecology, Lectures (also Entomology 456)] Fall. 2 credits. Prerequisites: Biological Sciences 261 and Entomology 212 or their equivalents. Recommended: concurrent enrollment in Biological Sciences 457. Offered alternate years. Not offered 1986–87.
Ecological and evolutionary principles are integrated through examination of outstanding investigations. Topics discussed include the factors responsible for the great diversification of insects, adaptive syndromes associated with climate, natural history of arthropod guilds, impact of insects on terrestrial vegetation, population regulation, and the contrast between natural and managed ecosystems.

[457 Insect Ecology, Laboratory (also Entomology 457)] Fall. 2 credits. Minimum enrollment of 12 students required; limited to 20 students.
Prerequisite: concurrent enrollment in Biological Sciences 455. Offered alternate years. Not offered 1986–87.
Lab, W 1:25–4:25, plus F or S field trips to be arranged during the fall season. R. B. Root. Field exercises focus on insect natural history and methods of sampling populations. Laboratories devoted to rearing insects, estimating life-table parameters, and analyzing communities.

[461 Oceanography] Fall. 3 credits. Prerequisites: college physics and either Biological Sciences 261 or 262. Required of all students doing work in the laboratory. S-U grades optional. Not offered 1986–87.
Lecs, T R 10:10. Additional lab, R 12:20, alternating with disc, T or R 1:25. Staff.
A general introduction to oceans, their role in the earth system, and the way in which they influence the physical and chemical processes that interact with marine environments. Discussions use case studies from current literature to illustrate application to problems in biological oceanography.

462 Limnology, Lectures Fall. 3 credits.
Prerequisite: Biological Sciences 261 or 262 or written permission of instructor. Recommended. Introductory chemistry.
Lecs, M W F 11:15. N. G. Hairston, Jr.
The study of continental waters, with emphasis on lakes and ponds. Factors regulating population and
community dynamics of freshwater organisms, as well as physical and chemical properties of fresh water, are considered.

463 Plant Ecology, Lectures Fall. 3 credits. Prerequisites: two advanced-level courses in biology, including Biological Sciences 261, or permission of instructor. Recommended: some taxonomic familiarity with vascular plants and concurrent enrollment in Biological Sciences 465.


464 Limnology, Laboratory Fall. 2 credits. Prerequisite: concurrent or previous enrollment in Biological Sciences 462.

Lab, T W R 1:25–4:25; 1 weekend field trip. N. G. Hairston, Jr., and staff. Laboratories and field trips devoted to studies of the biological, chemical, and physical properties of lakes and other freshwater environments.

465 Plant Ecology, Laboratory Fall. 1 credit. Prerequisite: concurrent enrollment in Biological Sciences 463.

Lab, F 12:05–12:55. P. L. Marks. Laboratory and field exercises designed to give firsthand experience with the ecology of plants. Emphasis is on making observations and measurements of plants in the field.

469 Agriculture, Society, and the Environment (also Agriculture and Life Sciences 469 and Biology and Society 412) Spring. 3 credits. Prerequisite: one year of introductory biology or permission of instructor. Not offered 1986–87.

Lecs, T R 12:20; disc, M 1:25–10:10. D. Pimentel and staff. This course emphasizes the importance of an ecological approach to agriculture. Included are assessments of the interrelationships of land and water management, soil productivity, plant breeding, livestock production, pest control, energy, economics, sociology, environmental pollution, and ecosystems. Agricultural ecology offers opportunities for sustainable effective use of natural resources for food production for the United States and the world in future decades.

471 Mammalogy Fall. 4 credits. Recommended: Biological Sciences 274. S-U grades optional, with permission of instructor. Not offered 1986–87.

Lecs, T R 12:20; disc, M 1:25–10:10. D. Pimentel and staff. Laboratory and field exercises designed to give firsthand experience in vertebrate zoology with written permission of instructor. S-U grades optional, with permission of instructor. Offered alternate years.

Lecs, M W F 12:20. J. L. Crise and staff. A survey of the major groups of organisms and their evolutionary histories. Intended to fill out the biological backgrounds of geology students and the geology background of biological students concerning the nature and significance of the fossil record for their respective studies.

479 Paleobiology (also Geological Sciences 479) Fall. 3 credits. Prerequisite: one year of introductory biology or equivalent experience in vertebrate zoology with written permission of instructor. S-U grades optional, with permission of instructor. Offered alternate years.

Lecs, M W F 12:20. J. L. Crise and staff. A seminar course on advanced limnological topics. Seminar presentations and discussions by students on areas of current research in vertebrate biology. Topics vary from semester to semester.

660 Field Studies in Ecology and Systematics Spring. Variable credit. Prerequisites: Biological Sciences 261 or 262, a taxon-oriented course, and permission of instructor. Estimated cost of room and board (exclusive of transportation) to be announced. Not offered 1986–87.

Lecs and labs to be arranged. Staff. This course provides students an opportunity to learn techniques and a variety of techniques for participating in an intensive series of field exercises. An extended field trip is scheduled during either intermission or spring break. The region visited, trip objectives, and other details are announced by the instructor in charge in the division's catalog supplement issued at the beginning of the semester. Meetings on campus are devoted to orientation and reports on completed projects.

661 Environmental Biology Policy (also Agriculture and Life Sciences 661 and Biology and Society 481) Fall and spring. 2 or 3 credits each term. Limited to 12 students. Prerequisite: permission of instructor. Offered alternate years.

665 Limnology Seminar Spring. 1 credit. May be repeated for credit. Primarily for graduate students; written permission of instructor required for undergraduates. S-U grades optional. Offered alternate years.

Lecs, 3 hours each week to be arranged. S. A. Levin. Current and classical theoretical issues in ecology and evolutionary biology. Biological issues are emphasized, although mathematical models are used throughout as tools to address those issues. Lectures cover both standard material and current journal articles.

669 Plant Ecology Seminar Spring. 1 credit. May be repeated for credit. Suggested for students majoring or minoring in plant ecology. S-U grades optional. Offered alternate years.

670 Graduate Seminar in Vertebrate Biology Fall or spring. 1 credit. May be repeated for credit. Primarily for graduate students; written permission of instructor required for undergraduates. S-U grades only. Offered alternate years.

673 Human Evolution: Concepts, History, and Theory Fall. 3 credits. Prerequisite: one year of introductory biology or permission of instructor. Offered alternate years.

Lecs, T W F 7:30–9:30 p.m.; additional hours to be arranged. K. A. R. Kennedy. The historical background of present-day concepts of man's evolutionary variations and adaptations in space and time is surveyed. The formation of biological anthropology as an area of scientific inquiry within the social and biological sciences is reviewed.

674 Principles of Systematics (also Entomology 674) Spring. 4 credits. Limited to 15 students. Prerequisite: permission of instructor. Recommended: an introductory biological systematics course. Not offered 1986–87.

Lecs, disc, and labs, M W 1:25–4:25. Q. D. Wheeler and staff. An introduction to modern theory and methods of systematic biology. Lectures are on theoretical systematics and include species concepts, evolution, nomenclature, and criteria of species. Labs include identification and research skills.

680 Paleobiology (also Geological Sciences 680) Fall. 4 credits. Prerequisite: Biological Sciences 274 or equivalent experience in vertebrate zoology with written permission of instructor. Limited to 15 students. S-U grades optional, with permission of instructor. Offered alternate years.


697 Principles of Biogeography Fall. 4 credits. Prerequisite: one year of introductory biology or experience in zoogeography, ecology, behavior, and physiology. Laboratory includes systematics, functional morphology, and behavior.

700 Mathematical Ecology (also Statistics and Biometry 662) Spring. 3 credits. Prerequisites: one year of calculus in statistics, mathematical statistics, or biometry. Recommended: a general ecology course. S-U grades optional, with permission of instructor. Offered alternate years.
760 Special Topics in Evolution and Ecology Fall or spring. 1–3 credits. May be repeated for credit. Enrollment limited. S-U grades optional, with permission of instructor. Hours to be arranged. Staff. Independent or group intensive study of special topics of current interest. Content varies and is arranged between student and staff member.


Sem, T 4-25. Staff. A seminar course on selected topics in population and community ecology. Topics vary from year to year.

785 Autecology/Population Ecology Fall. 4 credits. Prerequisite: Biological Sciences 261 or equivalent. S-U grades optional. Lects and disc, T R 10-10–12:05. Staff. Comparison of the responses and adaptations of organisms to environments in selected ecosystems. Emphasis on similarities and differences in molecular and organizational mechanisms by which plants and animals cope with their environments. Critical examination of the properties and dynamics of populations. Emphasis on theories of adaptation, population structures, dynamics, and regulation.

786 Communities and Ecosystems Spring. 4 credits. Prerequisite: Biological Sciences 261 or equivalent. Lects, T R 10-10–12:05. Staff. Structure, dynamics, and evolution of natural communities; species diversity; richness and gradient relations; and succession, climax, and disturbance. Comparative aspects of terrestrial, marine, and freshwater communities. Analysis of ecosystems in terms of energy flow, biogeochemistry, and model systems. Emphasis on functional and structural properties of communities and ecosystems.

Related Courses in Other Departments

Advanced Soil Microbiology (Agronomy 666)
Advanced Work in Animal Parasitology (Veterinary Medicine 737)
Animal Social Behavior (Biological Sciences 427)
Biology of Plant Species (Biological Sciences 442)
Early People: Human Cultural and Biological Evolution (Anthropology 203 and Archaeology 203)
Ecology and Human Food Production (Anthropology 375)

Marine Sciences Courses (Biological Sciences 363–370, 467, 477)

Phylogeny (Biological Sciences 348)

Plant Geography (Biological Sciences 440)

Plant Nematology (Plant Pathology 736)

Related Courses in Entomology (Entomology 212, 331, 332, 370, 453, 471, 621, 631, 633, 634, 636, 672)

Related Courses in Natural Resources (Natural Resources 302, 430, 603)

Soil Microbiology, Lectures (Agronomy 476)

Taxonomy of Vascular Plants (Biological Sciences 343)

Teaching Experience (Biological Sciences 498)

Topics in Ecological Anthropology (Anthropology 677)

Undergraduate Research in Biology (Biological Sciences 499)

Undergraduate Seminar in Biology (Biological Sciences 400)

Veterinary Parasitology (Veterinary Medicine 510)

Genetics and Development

281 Genetics Fall or spring. 5 credits. Not open to freshmen in fall semester. Enrollment may be limited to 200 students. Prerequisite: one year of introductory biology or equivalent. Students who have taken Biological Sciences 282 may register only with written permission of instructor. No admittance after first week of classes. Lects, T R 10:10–12:05; lab, M T W or R 2:30–4:25; additional hours to be arranged. Labs may also be scheduled T or R 8–9:55, W or F 10:10–12:05, F 2:30–4:25, or S 10:10–12:05 if enrollment requires it. Students do not choose lab sections during course enrollment; lab assignments are made during first day of classes. P. J. Bruns, T. D. Fox, M. L. Goldberg, R. J. MacIntyre.

A general study of the fundamental principles of genetics in eukaryotes and prokaryotes. Discussions of gene transmission, gene action and interaction, gene linkage and recombination, gene structure, gene and chromosome mutations, genetic aspects of differentiation, genes in populations, breeding systems, and extrachromosomal inheritance. Aspects of recombinant DNA technology are discussed. In the laboratory, students perform experiments with microorganisms and conduct an independent study of inheritance in Drosophila.

282 Human Genetics Spring. 2 or 3 credits (2 credits if taken after Biological Sciences 281). Each disc is limited to 25 students. Prerequisite: one year of introductory biology or equivalent; written permission of instructor for students who have taken Biological Sciences 281.

Lects, M W F 10:10; disc, R or F 10:10 or 11:15. Staff. An introduction to biological heredity through consideration of human genetics. Advances in the science of genetics are having a profound effect on our understanding of ourselves and on our potential for influencing our present and future well-being. The course is intended primarily to contribute to the student’s general education in these matters. Although certain aspects of genetics are considered with some rigor, the course is not designed to serve as a prerequisite to advanced courses in genetics.

385 Developmental Biology Fall. 3 credits. Prerequisite: Biological Sciences 281.

Lects, M W F 10:10. C. F. Aquadro.

An introduction to the morphogenetic, cellular, and genetic aspects of the developmental biology of animals.


A course in the embryonic development of vertebrate animals, with emphasis on the comparative aspects of morphogenesis and function at the tissue level. The laboratory has a strong morphogenetic bias, emphasizing the comparative aspects of developmental anatomy.]

480 Seminar in Developmental Biology Spring. 1 credit. May be repeated for credit. Limited to upperclass students. S-U grades only. Sem to be arranged. Staff.

481 Population Genetics Fall. 3 credits. Prerequisite: Biological Sciences 281 or equivalent.

S. A. Lees.

A study of factors that influence the genetic structure of Mendelian populations and that are involved in race formation and speciation. Topics include the diversity and measurement of genetic variation, mating and reproductive systems, selection and fitness, genetic drift, migration and population structure, mutation, multifocus models, the genetics of speciation, quantitative traits, and the relationship of molecular variation. The interplay between theory and the data from experiments and natural populations are emphasized.

482 Genetics and Society Spring. 2 credits. Prerequisites: Bio. Sci. 281 and 330 or 385. S-U grades optional.


Presentation of the technology and discussion of ethical and social implications of recent advances in genetics. Topics include genetic screening; wrongful life, choosing the sex of the fetus; physicians’ responsibilities; informed consent; early diagnoses; genetic privacy; the XYY controversy; IQ, race, and mental illness; gene “therapy.” This course may be used in fulfillment of the 9 credits required for the concentration in genetics and development.

483 Molecular Aspects of Development Spring. 3 credits. Prerequisites: Biological Sciences 281, 330 or 385, and permission of instructor. Lects, T R 10–11:45. M. F. Wolner.

An examination of the molecular biology of developing systems, with emphasis on the genomic, transcriptional, and translational mechanisms involved in regulating gene expression during development. Both prokaryotic and eukaryotic systems are considered, but emphasis is on the latter. Topics to be discussed include changes in chromatin structure, DNA rearrangements, control of RNA synthesis and processing, translational controls, nucleo-cytoplasmic interactions, and genetic responses to hormone treatment. The regulation of selected developmental systems is considered in detail.

484 Molecular Evolution Spring. 3 credits. Prerequisites: Biological Sciences 281 and organic chemistry. Offered alternate years. Not offered 1986–87.

Lects, T R 11:15. R. J. MacIntyre.

An analysis of evolutionary changes in proteins and nucleic acids, and gene–enzyme variability in natural populations. The role of natural selection in effecting these changes and maintaining genetic variation at a molecular level is critically examined. Theories on the evolution of the genetic code and the construction of phylogenetic trees from biochemical data are discussed.]
Neurobiology and Behavior

221 Neurobiology and Behavior I: Introduction to Behavior  
Fall. 3 or 4 credits. Prerequisites: Biological Sciences 221, 330 or 331, and 485, or written permission of instructor. S-U grades optional.

Lecs, T R 1:25; P. J. Bruns, T. D. Fox.
An advanced overview of genetic studies in two widely divergent groups of unicellular eucaryotes: ciliates and yeasts. Both formal genetic and molecular approaches to selected problems of biological interest in these organisms are discussed.

780 Current Topics in Genetics  
Spring. 2 credits. May be repeated for credit. Primarily for graduate students, with preference given to majors in the Field of Genetics; written permission of instructor required for undergraduates. Limited to 20 students. No auditors. S-U grades optional with permission of instructor. Sem to be arranged. Staff.
A seminar course with critical presentation and discussion by students of original research papers in a particular area of current interest. Content of the course and staff direction vary each year and are announced a semester in advance.

Related Courses in Other Departments

Animal Cytogenetics (Animal Science 419)
Animal Development (Veterinary Medicine 507)
Current Topics in Biochemistry (Biological Sciences 731–736)
Laboratory in Plant Molecular Biology (Biological Sciences 641)
Organic Evolution (Biological Sciences 378)
Plant Growth and Development (Biological Sciences 644)
Plant Molecular Genetics (Biological Sciences 653)
Undergraduate Research in Biology (Biological Sciences 499)

Neurobiology and Behavior

221 Neurobiology and Behavior I: Introduction to Behavior  
Fall. 3 or 4 credits (4 credits with discussion and term paper). 4-credit option required of students concentrating in neurobiology and behavior. Each disc limited to 20 students, with preference given to students concentrating in neurobiology and behavior. Not open to freshmen. Prerequisite: one year of introductory biology for majors and one year of chemistry. May be taken independently of Biological Sciences 222. S-U grades optional.

Lecs, M W F 12:20; disc to be arranged. S. T. Emlen and staff.
A general introduction to the field of behavior. Topics include evolution and behavior, behavioral ecology, sociobiology, chemical ecology, communication, neuroethology, rhythmicity, orientation and navigation, and hormonal mechanisms of behavior.

222 Neurobiology and Behavior II: Introduction to Neurobiology  
Spring. 3 or 4 credits (4 credits with discussion and term paper). 4-credit option required of students concentrating in neurobiology and behavior. Each disc limited to 20 students, with preference given to students concentrating in neurobiology and behavior. Not open to freshmen. Prerequisites: one year of introductory biology for majors and one year of chemistry. May be taken independently of Biological Sciences 221. S-U grades optional.

Lecs, M W F 12:20; disc to be arranged. S. T. Emlen and staff.
A general introduction to the field of cellular and integrative neurobiology. Topics include neural systems, neuroanatomy, developmental neurobiology, electrical properties of nerve cells, synaptic mechanisms, neurochemistry, motor systems, sensory systems, learning, and memory.

322 Hormones and Behavior (also Psychology 322)  
Spring. 3 or 4 credits (4 credits with discussion and term paper). Primarily for upperclass students; permission of instructor required for sophomores. Prerequisites: one year of introductory biology, and Biological Sciences 221 or 222 or a course in psychology S-U grades optional. Not offered 1986–87.

Lecs, T R 10:10–11:30; disc to be arranged. E. Atkins, H. R. E. Johnston.
The relationship between endocrine and neuroendocrine systems and the behavior of animals, including humans. Major emphasis is on sexual, parental, and aggressive behavior.

324 Biopsychology Laboratory (also Psychology 324)  
Fall. 4 credits. Limited to 25 upperclass students. Prerequisites: laboratory experience in biology or psychology. Biological Sciences 221 and 222 or Psychology 123 and 222, and permission of instructor. S-U grades optional.

Experiments designed to provide research experience in animal behavior (including learning) and its neural and hormonal mechanisms. A variety of techniques, species, and behavior patterns are included.

326 The Visual System  
Spring. 4 credits. Prerequisite: Biological Sciences 222 or permission of instructor. S-U grades optional. Offered alternate years.


Lecs, M W F 10:10; disc, 1 hour each week to be arranged. H. C. Howland.
The visual systems of vertebrates and invertebrates are discussed in breadth and depth. Topics covered include the optics of eyes, retinal neurophysiology, and structure and function of higher visual centers.

396 Introduction to Sensory Systems (also Psychology 396)  
Spring. 3 or 4 credits (4 credits with term paper). No auditors. Prerequisites: an introductory course in biology or biopsychology, and a second course in neurobiology or behavior or perception or cognition. Biopsychology students are expected to have elementary knowledge of perception, neurophysiology, behavior, and chemistry. Permission of instructor required for 4-credit option. S-U grades optional for graduate students only. Offered alternate years.


Lecs, M W F 9:05. B. P. Halpern.
This course is taught in the Socratic method, in which the instructor asks questions of the students. Students read, analyze, and present difficult original literature dealing with both those characteristics of sensory systems that are common across living organisms and those sensory properties that represent adaptations of animals to particular habitats or environments. The principles and limitations of major methods used to examine sensory systems are considered. General principles of sensory systems and auditory visual, and somesthetic systems are covered. One aspect of each system (e.g., localization of objects in space by sound, color vision, and thoreceptors) is selected for special attention. At the level of An Introduction to the Physiology of Vision, by J. O. Pickles; Photoreceptors: Their Role in Vision, by A. Fein and E. Z. Szuts; Comparative Studies of Hearing in Vertebrates, edited by A. N. Popper and R. R. Ray; and "Information Processing in Cutaneous Mechanoreceptors," Federation Proceedings 42:1983.

420 Topics in Neurobiology and Behavior  
Fall or spring. Variable credit. May be repeated for credit. Primarily for undergraduates. S-U grades optional.

To be arranged. Staff.
Courses on selected topics in neurobiology and behavior, can include lecture and seminar courses. Topics, instructors, and time of organizational meetings are listed in the division's catalog supplement issued at the beginning of the semester.

423 Animal Communication  
Fall. 3 credits. Prerequisites: Biological Sciences 221 and 222, college calculus, and college physics; or written permission of instructor.

Lecs-discs, M W F 1:25; C. D. Hopkins.
An introduction to general communication principles, such as information theory, signal and noise characteristics, linear systems analysis, signal transmission, and signal detection theory. Chemical, sound, electric, tactile, and electromagnetic cues are studied in depth. A discussion of the biological function of communication and an analysis of evolutionary theories of communication are included.

424 Neuroethology  
Fall. 3 credits. Prerequisites: Biological Sciences 221 and 222. S-U grades optional for graduate students only. Offered alternate years. Not offered 1986–87.

The integrated study of neurobiology and animal behavior. Representative topics include acoustic communication in insects and amphibians, vocal mechanisms and plasticity of bird song, mammalian hearing, bat echolocation, prey detection by owls, electroproduction and electroreception in fish, neurophysiology and behavior of pheomone communication, neuroethology in anurans, mammalian visual processing, command neurons and decision networks, locomotion and motor-pattern generation, escape behavior in invertebrates, and neural correlates of learning. Assigned readings include original articles in the scientific literature. A term paper on the neural basis of animal behavior is required.

426 Electronics for Neurobiology  
Spring. 3 credits. Limited to 20 students. Prerequisites: Biological Sciences 222 and one year of introductory physics.

Lecs, T R 9:05; lab, 4 hours each week to be arranged. B. R. Land.
Electronics as applied to electrophysiological instrumentation, data acquisition, and analysis. Topics include a review of basic electrical concepts, the cell as a circuit, design of amplifiers and pulse generators for biological use, and computer interfacing to an experiment.

427 Animal Social Behavior  
Fall. 3 credits. Limited to 30 students. Prerequisites: Biological Sciences 221, and 261 or 262. S-U grades optional, with permission of instructor. Offered alternate years.

An intensive course for upper-division students interested in the adaptive bases of social behavior. Lecture-discussions, dissections, and computer presentations examine the extrinsic (ecological) and intrinsic (genetic) factors underlying cooperation and conflict in animal societies. Topics include spacing systems, mating systems, sexual selection, mate choice, sex allocation, communication, predation, and nemesis.

Spring. 2 credits. Limited to 35 students. Prerequisite: Biological Sciences 221. Not offered 1986–87.

A comprehensive survey of current research emphasizing cues, receptors, and mechanisms used for orientation. Lectures draw upon examples from invertebrate and vertebrate species, and consider orientation systems within evolutionary and ecological contexts. Particular emphasis is given to the sensory basis for orientation, including visual, acoustic, olfactory, and electromagnetic cues.

429 Offalation and Taste: Structure and Function (also Psychology 429)  
Fall. 3 credits. Prerequisite: a 300-level course in biopsychology or equivalent. S-U grades optional. Offered alternate years.

Lecs, T R 9:05; disc to be arranged. B. P. Halpern.
The structural and functional characteristics of offalation and taste are explored by reading and discussing current literature in these areas. Structure is examined
at the light and electron microscope levels, as well as at the molecular level. The neurophysiological and biochemical aspects of functional cells are considered. The emphasis of the course is on vertebrates, especially air-breathing vertebrates in the case of olfaction, although there is some coverage of invertebrate forms.

491 Principles of Neurophysiology Fall. 4 credits. Limited to 20 students. Prerequisite: Biological Sciences 222 or written permission of instructor. Offered alternate years.

Lecs, M W F 10:10; disc, 1 hour each week to be arranged. H. C. Howland, B. P Halpern. Classical topics in sensory function such as vision, hearing, touch, and balance, as well as some more modern topics, including sensory coding, locations of stimulus sources in space, and the development of sensory systems. Both human and nonhuman systems are discussed. In all cases the chemical, physical, and neurophysiological bases of sensory information are treated, and the processing of this information is followed into the central nervous system. At the level of the Senses, edited by Barlow and Mollon, and Sense Organs, edited by M. S. Laverack and D. J. Cosens.

493 Developmental Neurobiology Fall. 3 credits. Prerequisite: Biological Sciences 222 or permission of instructor. S-U grades optional. Offered alternate years. Not offered 1986–87.

Lecs, T R 9:05; disc to be arranged. R. B. Campenot. The embryologic development of the nervous system is considered in the light of both historical and current research. Emphasis is on cellular issues, that is, how do nerve cells differentiate both morphologically and biochemically, and how do they interact to produce a properly wired nervous system?

497 Neurochemistry and Molecular Neurobiology Fall. 3 credits. Limited to 30 students. Prerequisites: Biological Sciences 222 and either 330 or 331, or permission of instructor. S-U grades optional. Offered alternate years.

Lecs, T R 9:05; disc, T 10:10. R. T. Podleski. This course focuses primarily on synaptic neurotransmitter. The pre-synaptic regulation of release and post-synaptic mechanism of action of the major classes of neurotransmitters are discussed, as well as selected neuropeptides and hormones. Molecular and gene cloning techniques that are used to analyze these topics are discussed. Readings are primarily from journal articles.

622 Laboratory in Neural Systems and Behavior Fall or spring. 3 credits. Limited to 6 students concentrating in neurobiology and behavior. Prerequisites: Biological Sciences 221, and 491, and permission of instructor. Admission to the course requires a personal interview with the instructor. Offered alternate years. Not offered 1986–87.

Lecs and labs, 7 hours each week to be arranged. R. R. Hoy and staff.

A series of research-oriented exercises dealing with the neural basis of behavior. Techniques in anatomy, physiology, and behavior are taught. The experimental materials are primarily invertebrate animals in which a cellular analysis is feasible.

623 Chemical Communication (also Chemistry 622) Fall. 3 credits. Primarily for research-oriented students. Limited to 30 senior and graduate students. Prerequisites: one year of introductory biology for majors or equivalent, course work in biochemistry, and Chemistry 358 or equivalent. Offered alternate years.

Lecs, M W F 1:25. T. Eisner, J. Meinwald, W. L. Roelofs, and guest speakers. The production, transmission, and reception of chemical signals in communication interactions of animals, plants, and microorganisms. Studies of insects are emphasized. Specific topics are treated with varying emphasis on chemical, biochemical, ecological, behavioral, and evolutionary principles.

626 Sex Differences in Brain and Behavior (also Psychology 524) Spring, 2 credits. Limited to 12 students. Prerequisite: Biological Sciences 322 or permission of instructor.

Disc and sem, M W 3:35–5:30. T. DeVoogd. A survey of the newly discovered animal models for sex differences in the brain. Topics include the role of steroids in brain development, whether hormones can modify the structure of the adult brain, and the consequences of such sex differences in anatomy for behavior.

694 Comparative Vertebrate Neuroanatomy Spring. 3 credits. Intended for juniors, seniors, and graduate students. Prerequisite: Biological Sciences 332 or permission of instructor. S-U grades optional. Offered alternate years.


720 Seminar in Advanced Topics in Neurobiology and Behavior Fall or spring. Variable credit. May be repeated for credit. Primarily for graduate students; written permission of instructor required for undergraduates. S-U grades optional. Lab to be arranged. Staff.

A course designed to provide in-depth knowledge of current research in anatomical and physiological bases of vertebrate and invertebrate behavior. Readings are primarily from specialty books and selected journal articles. Topic and instructor are listed in the division's catalog supplement issued at the beginning of the semester.

724 Field Methods in Animal Behavior Fall or spring. Variable credit. May be repeated for credit. Primarily for graduate students in behavior. Prerequisite: permission of instructor. S-U grades optional. Lab and fieldwork to be arranged. Staff.

A seminar-field experience course designed for first-year graduate students in animal behavior. Weekly seminars discussing field methodology, data collection, and hypothesis testing are followed by an intensive period (ten days to two weeks) in the field. Specific topics and field sites vary from semester to semester. Topic and instructor are listed in the division's catalog supplement issued at the beginning of the semester.

725 Advanced Topics in Cellular and Molecular Neurobiology Fall or spring. Variable credit. May be repeated for credit. Limited to graduate students and advanced undergraduates concentrating in neurobiology and behavior. Prerequisite: Biological Sciences 222. S-U grades optional.

Lecs and sem to be arranged. Staff.

A lecture-seminar course on selected topics in cellular and molecular neurobiology. Students read original papers in the scientific literature and lead discussions of these articles. Suggestions for topics may be submitted by faculty or students to the chairperson of the Division of Neurobiology. Topic and instructor are listed in the division's catalog supplement issued at the beginning of the semester.

726 Advanced Laboratory in Cellular and Molecular Neurobiology Fall or spring. Variable credit. May be repeated for credit. Primarily for graduate students; written permission of instructor is required for undergraduates. S-U grades optional.

Lab to be arranged. Staff.

A two-week intensive laboratory course designed to provide experience with a specific technique currently used in cellular and molecular neurobiology. The technique under study and instructor in charge vary from semester to semester and are listed in the division's catalog supplement issued at the beginning of the semester.

730 Advanced Topics in Integrative Neurobiology Fall or spring. Variable credit. May be repeated for credit. Primarily for graduate students; written permission of instructor is required for undergraduates. S-U grades optional.

Lecs and discs to be arranged. Staff.

A course designed to provide in-depth knowledge of current research in anatomical and physiological bases of vertebrate and invertebrate behavior. Readings are primarily from specialty books and selected journal articles. Topic and instructor are listed in the division's catalog supplement issued at the beginning of the semester.

734 Laboratory Techniques in Integrative Neurobiology Fall or spring. Variable credit. May be repeated for credit. Prerequisite: permission of instructor based upon a personal interview.

Lab to be arranged. Staff.

A laboratory in the integrative, or neuroethological, approach to studies of animal behavior. Designed to provide practical working knowledge of research methods in anatomical and physiological behavior. Approaches to studying vertebrate and invertebrate behavior. Laboratory technique to be covered and instructor are listed in the division's catalog supplement issued at the beginning of the semester.

Related Courses in Other Departments

Animal Behavior (Psychology 535)

Biochemistry and Human Behavior (Psychology 361 and Nutritional Sciences 361)

Brain and Behavior (Psychology 425)
Courses in Marine Sciences

Although there is no concentration in marine sciences offered to Cornell undergraduates, there is extensive opportunity at the undergraduate level to prepare for more advanced study. Students interested in the marine sciences may enroll in courses offered at Cornell's Shoals Marine Laboratory (SML), a seasonal field station located on ninety-five-acre Appledore Island, six miles off the Maine and New Hampshire coasts. The Ithaca campus functions of the Shoals Marine Laboratory (SML) on an island off Portsmouth, N.H. For more details and application, consult the SML office, G 41 Stimson Hall. Estimated cost (includes tuition, room and board, and ferry transportation), $3590.

Daily lecs, labs, and fieldwork for 10 days. SML faculty.

Designed to give an overview of living marine organisms (algae, invertebrates, fishes, marine mammals, and shorebirds) and of the environment they inhabit. Fieldwork is emphasized. Occasional lectures and films deal with additional topics such as coastal zone problems, marine fisheries, economics of marine organisms, and educational resources of the marine environment. The core faculty of marine biologists is augmented by specialists in science and environmental education.

364 Field Marine Science Summer. 6 credits. Prerequisite: one year of college biology or other supporting subject. S-U grades optional. A special 4-week course offered twice each summer at Cornell's Shoals Marine Laboratory (SML), on an island off Portsmouth, N.H. For more details and application, consult the SML office, G 41 Stimson Hall. Estimated cost (includes tuition, room and board, and ferry transportation), $1,540.

365 Underwater Research Summer. 2 credits. Prerequisite: one year of college-level biology or other supporting subject, recognized scuba certification, and a medical examination. S-U grades optional. A special 2-week course offered at Cornell's Shoals Marine Laboratory (SML), on an island off Portsmouth, N.H. For more details and application, consult the SML office, G 41 Stimson Hall. Estimated cost (includes tuition, room and board, and ferry transportation), $825.

366 SEA Introduction to Oceanographic Data Collection and Analysis Summer. 2 credits. Prerequisite: Underwater Research (Marine Sciences 365) or instructor's permission. A special 2-week course offered at Cornell's Shoals Marine Laboratory (SML), on an island off Portsmouth, N.H. For more details and application, consult the SML office, G 41 Stimson Hall. Estimated cost (includes tuition, room and board, and ferry transportation), $930.

367 SEA Introduction to Maritime Studies 3 credits. Prerequisite: concurrent enrollment in Biological Sciences 366 and 367. An interdisciplinary introduction to our relationship with the marine environment. Covers the elements of maritime history, law, literature, and art necessary to appreciate our marine heritage and to understand the political and economic problems of contemporary maritime affairs.

368 SEA Introduction to Nautical Science credits. Prerequisite: college algebra or equivalent, and concurrent enrollment in Biological Sciences 366 and 367. An introduction to the technologies of operation at sea. The concepts of navigation (electronic), naval architecture, ship construction, marine engineering systems, and the physics of sail are taught from their bases in astronomy, mathematics, and physics. Provides the theoretical foundation for the navigation, seamanship, and engineering that the student employs at sea.

Sea Component (six weeks) Courses 369 and 370 take place aboard the R/V Westward, a 250-ton steel auxiliary-powered staysail schooner built in 1961. Westward normally puts to sea with a ship's company of thirty-four. The professional staff of nine includes the captain, the chief scientist, two science watch officers, three deck watch officers, an electrical engineer, and a steward. One or more visiting investigators are frequently aboard. Up to twenty-five students round out the complement.

369 SEA Oceanographic Laboratory I 4 credits. Prerequisite: Biological Sciences 366. Theories and problems raised in the shore component are tested in the practice of oceanography at sea. Students are introduced to the tools and techniques of the practicing oceanographer. During lectures, students are instructed in the operation of basic oceanographic equipment; in the methodologies involved in the collection, reduction, and analysis of oceanographic data; and in the attendant operations of a sailing oceanographic research vessel.

370 SEA Oceanographic Laboratory II 4 credits. Prerequisite: Biological Sciences 368. Building on the experience of Oceanographic Laboratory I, students assume increasing responsibility for conducting oceanographic research and for operating parts of the vessel. The individual student is ultimately responsible directly to the chief scientist and the master of the vessel for the safe and orderly conduct of research activities and related operations of the vessel. Each student undertakes an individual research project designed during the shore component.
Adaptations of Marine Organisms  Summer 4 credits. Prerequisite: Biological Sciences 364 or 315 or a special course in physiological ecology. S-U grades optional. A special 3-week course offered at Cornell's Shoals Marine Laboratory (SML), on an island off Portsmouth, N.H. For more details and application, consult the SML office, G 4 Stimson Hall. Estimated cost (includes tuition, room and board, and ferry transportation), $1,185. Daily lecs, labs, and fieldwork for 3 weeks. SML faculty.

An introduction to the physiological ecology and functional morphology of marine plants and animals, with emphasis on selected algal and invertebrate ecotones near the Gulf of Maine. Topics covered include photosynthesis in the marine environment; respiration in intertidal organisms; carbohydrates, proteins, and lipids as nutrients in the sea; accretion and tolerance of tide-pool biota, and biological responses to competition and grazing. Field and laboratory exercises explore principles and procedures used to characterize the physical, chemical, and biotic environment of intertidal and shallow subtidal organisms, including determination of temperature, light, salinity, oxygen and nutrient levels, and in vivo functional analyses of metabolic phenomena.

Marine Botany: Ecology of Marine Plants  Summer 4 credits. Prerequisite: Biological Sciences 364 or general familiarity with marine algae. S-U grades optional. A special 3-week course offered at Cornell's Shoals Marine Laboratory (SML), on an island off Portsmouth, N.H. For more details and application, consult the SML office, G 4 Stimson Hall. Estimated cost (includes tuition, room and board, and ferry transportation), $1,155. Daily lecs, labs, and fieldwork for 3 weeks. SML faculty.

An overview of the major marine algal groups, including aspects of anatomy, morphology, development, life histories, and ecology. Laboratories and fieldwork emphasize relationships between distribution and major environmental parameters and involve student projects.

Ecology and Chemistry of Rock-Pool Environments  Summer 4 credits. Prerequisites: one year of introductory college chemistry and an introductory ecology course at the college level. S-U grades optional. A special 3-week course offered at Cornell's Shoals Marine Laboratory (SML), on an island off Portsmouth, N.H. For more details and application, consult the SML office, G 4 Stimson Hall. Estimated cost (includes tuition, room and board, and ferry transportation), $1,185. Daily lecs, labs, and fieldwork for 3 weeks. SML faculty.

A project oriented course emphasizing the interrelationships of the chemistry and biology of both rock- and tide-pool ecosystems, using the numerous pools on the island as natural laboratories. Laboratory work includes organism identification; chemical analyses of pools for nutrients, pH, alkalinity, dissolved carbon dioxide and oxygen, salinity, plant pigments, and primary productivity; and lethal temperature, salinity, and pH level determinations for different species and populations. Lectures and class research projects cover the effects of pool morphology and algal growth on pool temperature, chemistry, and stratification; salinity changes caused by evaporation, rainfall, and submarine seepages; dissolved oxygen and pH changes associated with primary production; nutrient dynamics relative to rainfall, flowthrough, primary production, microbial activities, and proximity to nesting and breeding areas; bird and mammal species differences among pool types; and predation experiments with fish and invertebrates. Food web and energy models for different pool types; and predation experiments with fish and nesting birds; primary production differences among different pools; effects of physical factors on nutrients, pH, chlorophyll, salinity, and suspended materials in coastal waters, with some work on the analysis of coastal sediments. 477 Topics in Marine Vertebrates  Summer 4 credits. Prerequisite: Biological Sciences 364 or 274 or a course in vertebrate biology. S-U grades optional. A special 3-week course offered at Cornell's Shoals Marine Laboratory (SML), on an island off Portsmouth, N.H. For more details and application, consult the SML office, G 4 Stimson Hall. Estimated cost (includes tuition, room and board, and ferry transportation), $1,185. Daily lecs, labs, and fieldwork for 3 weeks. SML faculty.

Topics in marine vertebrate biology emphasizing laboratory studies, field collections or observations, and readings from the current literature. Topics covered include systematics of fishes of the Gulf of Maine, elasmobranch physiology, interpretation of life history and feeding strategies, taxonomy and identification of skeletal muscle structure and function, population biology and the contemporary Gulf of Maine fishery. Mesozoic marine reptiles, the biology of sea turtles in cold waters, cold early development of birds, avian adaptations to life at sea, evolution and systematics of marine mammals, diving physiology, and ecology and conservation of existing marine mammal populations.

Reproduction and Development of Marine Invertebrates  Summer 4 credits. Prerequisite: Biological Sciences 364 or a course in invertebrate zoology. S-U grades optional. A special 3-week course offered at Cornell's Shoals Marine Laboratory (SML), on an island off Portsmouth, N.H. For more details and application, consult the SML office, G 4 Stimson Hall. Estimated cost (includes tuition, room and board, and ferry transportation), $1,155. Daily lecs, labs, and fieldwork for 3 weeks. SML faculty.

A laboratory-oriented course emphasizing processes of fertilization, cleavage, gastrulation, morphogenesis through metamorphosis, camera lucida and photomicrographic recording of embryonic development, and design and execution of basic experiments on eggs and embryos. Lectures complement laboratory work through phylogenetic examination of classical invertebrate embryology and modern experimental developmental biology.

Archaeology of Maritime Communities (Archaeology 300: Individual Study in Archaeology)  Summer 1 credit. Prerequisite: Archaeology 10 or permission of instructor. Recognized scuba certification and a medical examination required for students engaging in underwater research. A special 1-week course offered at Cornell's Shoals Marine Laboratory (SML), on an island off Portsmouth, N.H. For more details and application, consult the SML office, G 4 Stimson Hall. Estimated cost (includes tuition, room and board, and ferry transportation), $470. Daily lecs, labs, and fieldwork for 1 week. SML faculty.

Fieldwork on various land sites and their adjacent offshore marine environments. Artifact analysis, preliminary conservation and/or recording of finds are emphasized. Methods of archaeological research, including the use of archives and historical materials, and publication methodologies as well as the larger questions in the discipline are discussed. Students sufficiently skilled in underwater work have the opportunity to work on local wrecks.

Coastal and Ocean Law and Policy (Natural Resources 306)  Summer 1 credit. A special 1-week course offered at Cornell's Shoals Marine Laboratory (SML), on an island off Portsmouth, N.H. For more details and application, consult the SML office, G 4 Stimson Hall. Estimated cost (includes tuition, room and board, and ferry transportation), $450. Daily lecs and disc for 1 week. SML faculty.

Intended for persons interested in careers in management of marine or coastal resources or in the natural sciences. Slaw, policy related to ocean dumping, marine sanctuaries, environmental impact statements, water and air pollution, fisheries management, offshore gas and oil production, and territorial jurisdiction. Lectures on the status and history of law are accompanied by discussion of relevant policy and analysis of the efficacy of various legal techniques. A case study that requires extensive use of the laboratory's library and personnel is assigned. The week concludes with a mock hearing.

Introduction to Marine Pollution and Its Control (Agricultural Engineering 420)  Summer 2 credits. Prerequisite: Biological Sciences 364 or permission of instructor. A special 2-week course offered at Cornell's Shoals Marine Laboratory (SML), on an island off Portsmouth, N.H. For more details and application, consult the SML office, G 4 Stimson Hall. Estimated cost (includes tuition, room and board, and ferry transportation), $805. Daily lecs, labs, and fieldwork for 2 weeks. SML faculty.

Dispersion modeling and the effects of pollutants (including oil, outfalls, solid wastes, sludge and dredge spoils, and radioactive wastes) are approached from the perspectives of elementary physical oceanography and biological processes. Laboratories include basic methods for targeting and tracing wastewater; organic carbon determinations; microbial tests for Salmonella, E. coli, and Streplococcus; and practical field projects.

Marine and Coastal Geology (Geological Sciences 213)  Summer 1 credit. Prerequisite: An introductory course in geology or permission of instructor. A special 1-week course offered at Cornell's Shoals Marine Laboratory (SML), on an island off Portsmouth, N.H. For more details and application, consult the SML office, G 4 Stimson Hall. Estimated cost (includes tuition, room and board, and ferry transportation), $450. Daily lecs, labs, and fieldwork for 1 week. SML faculty.

With "New England coast" defined as beginning at the -200 meter isobath and proceeding westward, this course examines specific geological events and processes important in shaping the area's bedrock and surficial sediments. Petrology, geophysics, and the Pleistocene geology of the region are investigated. Consideration of the geologic history of New England within the plate tectonic model is emphasized. Examination of selected areas is used to test micro-, meso-, and macroscale geochemical and petrologic dating techniques employed today. The week concludes with a mock hearing.

Marine Resources: Economic Modeling of Use and Regulation (Agricultural Economics 252)  Summer 1 credit. Prerequisite: An introductory course in economics or permission of instructor. A special 1-week course offered at Cornell's Shoals Marine Laboratory (SML), on an island off Portsmouth, N.H. For more details and application, consult the SML office, G 4 Stimson Hall. Estimated cost (includes tuition, room and board, and ferry transportation), $450. Daily lecs, labs, and fieldwork for 1 week. SML faculty.

Resource economics in general is concerned with the optimal allocations through time of renewable and
nonrenewable resources. This course examines fisheries management, offshore oil and gas recovery, and ocean-minerals mining. Models of optimal resource use are developed and used to assess both the behavior of those harvesting marine resources and the adequacy of current governmental policy. An integral part of the course is the special opportunity to observe and interview those professionally involved in harvesting marine resources in the Gulf of Maine.

Practical Archaeology under Water: A Basic Introduction (Archeology 319) Summer 1 credit. Prerequisite: recognized scuba certification and a medical examination required for students engaging in underwater research. A special 1-week course offered at Cornell’s Shoals Marine Laboratory (SML), on an island off Portsmouth, N.H. For more details and application, consult the SML office, G 4 Stimson Hall. Estimated cost (includes tuition, room and board, and ferry transportation), $470. Daily labs, labs, and fieldwork for 1 week. SML faculty.

Introduction to the subject and a review of this contemporary subdiscipline of archaeology. The approach of the course is practical, with a strong potential for actual on-site experience in search, site recognition, survey, and recording. The course also covers the history and development of the subject, the legal aspects of underwater research, and the worldwide potential of the field. Since any archaeological research project involves a great deal more than digging, the course provides ample opportunities for those who are interested in the subject but are not divers or sufficiently experienced in scuba.

Waterland Resources (Natural Resources 417) Summer 1 credit. Prerequisite: one year of college biology. A special 1-week course offered at Cornell’s Shoals Marine Laboratory (SML), on an island off Portsmouth, N.H. For more details and application, consult the SML office, G 4 Stimson Hall. Estimated cost (includes tuition, room and board, and ferry transportation), $450. Daily labs, labs, and fieldwork for 1 week. SML faculty.

An examination of coastal and adjacent freshwater wetlands from historic, destruction, and preservation perspectives, including fresh- and salt-marsh ecology and management. Field trips to selected examples of the wetlands under discussion and follow-up laboratories emphasize succession, plant identification and classification, and examination of the dominant insect and vertebrate associations.

Courses in Biophysics

Biophysics is an interdisciplinary undergraduate and graduate program. A special program for undergraduate students interested in biophysics is offered as an independent concentration in the graduate program. A special program for Biomechanical Systems—Analysis and Design (Mechanical and Aerospace Engineering 565)

Chemistry of Nucleic Acids (Chemistry 677)

Electron Microscopy for Biologists (Biological Sciences 600, 603, 606, 608)

Enzyme Catalysis and Regulation (Chemistry 672)

Introduction to Biophysics (Biological Sciences 309 and Applied and Engineering Physics 306)

Membrane Biophysics (Applied and Engineering Physics 615)

Membranes and Bioenergetics (Biological Sciences 632)

Modern Physical Methods in Macromolecular Characterization (Applied and Engineering Physics 616)

Neuroethology (Biological Sciences 424)

Photosynthesis (Biological Sciences 445 and Applied and Engineering Physics 601)

Physical Chemistry of Proteins (Chemistry 686)

Principles of Neurophysiology (Biological Sciences 491)

Protein Structure and Function (Biological Sciences 631)

Special Topics in Biophysical and Bioorganic Chemistry (Chemistry 782)

Special Topics in Biophysics (Applied and Engineering Physics 614)

Transport of Solutes and Water in Plants (Biological Sciences 649)

Faculty Roster

New York State College of Agriculture and Life Sciences

Adler, Kraig K., Ph.D., U. of Michigan. Prof., Neurobiology and Behavior
Bates, David M., Ph.D., U. of California at Los Angeles. Prof., Bailey Hortorium
Byenbach, Kraus W., Ph.D., Washington State U. Assoc. Prof., Physiology/Veterinary Physiology
Brund, Peter J., Ph.D., U. of Illinois. Prof., Genetics and Development
Cade, Thomas J., Ph.D., U. of California at Los Angeles. Prof., Ecology and Systematics
Calvo, Joseph M., Ph.D., Washington State U. William T Keeton Professor in Biological Sciences; Biochemistry, Molecular and Cell Biology
Cook, Robert E., Ph.D., Yale U. Assoc. Prof., Ecology and Systematics/Plantations
Davies, Peter J., Ph.D., U. of Reading (England). Prof., Plant Biology
Dyke, Jeffrey J., Ph.D., Indiana U. Asst. Prof., Bailey Hortorium
Eisner, Thomas, Ph.D., Harvard U. Jacob Gould Schurman Professor, Neurobiology and Behavior
Ensminger, Stephen T., Ph.D., U. of Michigan. Prof., Neurobiology and Behavior
Fox, Thomas D., Ph.D., Harvard U. Assoc. Prof., Genetics and Development
Gibson, Jane, Ph.D., U. of London (England). Prof., Biochemistry, Molecular and Cell Biology
Goldberg, Michael L., Ph.D., Stanford U. Assoc. Prof., Genetics and Development
Hanson, Maureen R., Ph.D., Harvard U. Assoc. Prof., Genetics and Development
Harris-Warrick, Ronald M., Ph.D., Stanford U. Assoc. Prof., Neurobiology and Behavior
Hopkins, Carl D., Ph.D., Rockefeller U. Prof., Neurobiology and Behavior
Ingram, John W., Jr., Ph.D., U. of California at Berkeley. Assoc. Prof., Bailey Hortorium
Jagendorf, Andrea T., Ph.D., Yale U. Liberty Hyde Bailey Professor of Plant Physiology, Plant Biology
Keller, Elizabeth B., Ph.D., Cornell U. Prof., Biochemistry, Molecular and Cell Biology
Kempf, Kenneth E., Ph.D., Indiana U. Asst. Prof., Genetics and Development

Lis, John T. Ph.D., Brandeis U. Assoc. Prof., Biochemistry, Molecular and Cell Biology
Low, Ellis R., Ph.D., U. of California at Los Angeles. Assoc. Prof., Physiology/Veterinary Physiology
McCarty, Richard F., Ph.D., Johns Hopkins U. Prof., Biochemistry, Molecular and Cell Biology
McCune, Amy R., Ph.D., Yale U. Asst. Prof., Ecology and Systematics
MacIntyre, Ross J., Ph.D., Johns Hopkins U. Prof., Genetics and Development
Marks, Peter L., Ph.D., Yale U. Assoc. Prof., Ecology and Systematics
Meffert, J. Keith, Ph.D., Cambridge U. (England). Prof., Biochemistry, Molecular and Cell Biology
Nassarallah, June B., Ph.D., Cornell U. Asst. Prof., Plant Biology
Nixon, Kevin C., Ph.D., U of Texas at Austin. Asst. Prof., Bailey Hortorium
Owens, Thomas G., Ph.D., Cornell U. Asst. Prof., Plant Biology
Pacioc, Dominick J., Jr., Ph.D., U. of California at Davis. Prof., Plant Biology
Parthasarathy, Mandayam V., Ph.D., Cornell U. Prof., Plant Biology
Pough, H. Harvey, Ph.D., U. of California at Los Angeles. Prof., Ecology and Systematics
Quarrini, Andrea, Ph.D., U. of Pavia (Italy). Asst. Prof., Physiology
Roberts, Jeffrey W., Ph.D., Harvard U. Prof., Biochemistry, Molecular and Cell Biology
Rodriguez, R. D., Ph.D., U. of California at Berkeley. Prof., Ecology and Systematics/Entomology
Sanes, Roger M., Ph.D., U of Edinburgh (Scotland). Prof., Plant Biology
Tye, B. Kwoon, Ph.D., Massachusetts Inst. of Technology. Assoc. Prof., Biochemistry, Molecular and Cell Biology
Uhl, Natalie W., Ph.D., Cornell U. Assoc. Prof., Bailey Hortorium
Vogt, Valer., Ph.D., Harvard U. Assoc. Prof., Biochemistry, Molecular and Cell Biology
Welch, Charles, Ph.D., Cornell U. Prof., Neurobiology and Behavior/Laboratory of Omithology
Young, David A., Ph.D., Claremont Graduate School. Assoc. Prof., Bailey Hortorium
Zahler, Stanley A., Ph.D., U. of Chicago. Prof., Genetics and Development

Other Teaching Personnel

Alexander, Renee R., Ph.D., Cornell U. Lecturer, Biochemistry, Molecular and Cell Biology
Calvo, Rita A., Ph.D., Cornell U. Lecturer, Genetics and Development
Dawley, Ellen M., Ph.D., U. of Connecticut. Instructor, Ecology and Systematics
Dawley, Robert B., Ph.D., U. of Connecticut. Instructor, Ecology and Systematics
Ecklund, K. Richard, Ph.D., Oregon State U. Lecturer, Neurobiology and Behavior
Ferger, Martha F. Ph.D., Cornell U. Medical College, Sr. Lecturer, Biochemistry, Molecular and Cell Biology
Glase, Jon C., Ph.D., Cornell U. Sr. Lecturer, Neurobiology and Behavior
Griffiths, Joan M., Ph.D., Cornell U. Lecturer, Biochemistry, Molecular and Cell Biology
Heiser, John B., Ph.D., Cornell U. Sr. Lecturer, Ecology and Systematics
Land, Bruce R., Ph.D., Cornell U. Sr. Lecturer, Neurobiology and Behavior
McFadden, Carol H., Ph.D., Cornell U. Sr. Lecturer, Physiology
Reiss, H. Carol, M.S., Cornell U. Lecturer, Plant Biology

Joint Appointees

Alscher, Ruth G., Adjunct Asst. Prof., Boyce Thompson Institute/Plant Biology
Barker, Robert, Prof., Provost’s Office/Biochemistry, Molecular and Cell Biology
Bedford, Barbara L., Adjunct Asst. Prof., Ecosystems Research Center/Ecology and Systematics

Faculty Roster 259
Bloom, Stephen E., Assoc. Prof., Poultry and Avian Sciences/Biological Sciences
Borr, Arthur C., Adjunct Prof., U. of New Hampshire/Biological Sciences
Brown, William L., Jr., Prof., Entomology/Ecology and Systematics
Butler, Walter R., Assoc. Prof., Animal Science/Physiology
Currie, W. Bruce, Assoc. Prof., Animal Science/Physiology
Foote, Robert H., Jacob Gould Schurman Professor, Animal Science/Physiology
Kochian, Leon V., Adjunct Asst. Prof., USDA Science and Education Administration/Plant Biology
Korf, Richard P., Prof., Plant Pathology/Bailey Hortorium
LaRue, Thomas A., Adjunct Prof., Boyce Thompson Institute/Plant Biology
Leopold, A. Carl, Adjunct Prof., Boyce Thompson Institute/Plant Biology
Novak, Joseph D., Prof., Education/Biological Sciences
Pimentel, David, Prof., Entomology/Ecology and Systematics
Richard, Milo E., Assoc. Prof., USDA Fish and Wildlife Service/Natural Resources/Ecology and Systematics
Szalay, Aladar A., Adjunct Asst. Prof., Boyce Thompson Institute/Biological Sciences
Tama, Jeane A., Adjunct Assoc. Prof.,ITHACA College/Plant Biology
Thompson, John F., Adjunct Prof., USDA Science and Education Administration/Plant Biology
Tuck, Edward B., Adjunct Asst. Prof., Vassar College/Plant Biology
VanDemark, Paul J., Prof., Microbiology/Biological Sciences
van Tienhoven, Ari, Prof., Poultry and Avian Sciences/Physiology
Weeden, Norman F., Asst. Prof., Horticultural Sciences/Bailey Hortorium
Wheeler, Quentin D., Asst. Prof., Entomology/Bailey Hortorium

**College of Arts and Sciences**

Aquadro, Charles F., Ph.D., U. of Georgia, Asst. Prof., Genetics and Development/Ecology and Systematics
Bass, Andrew H., Ph.D., U. of Michigan, Asst. Prof., Neurobiology and Behavior
Blackler, Antoine W., Ph.D., U. of London (England), Prof., Genetics and Development
Breitwieser, Anthony P., Ph.D., Leeds U. (England), Asst. Prof., Biochemistry/Molecular and Cell Biology
Brown, William J., Ph.D., U. of Texas Health Science Center at Dallas, Asst. Prof., Biochemistry, Molecular and Cell Biology
Campenot, Robert B., Ph.D., Massachusetts Inst. of Technology, Asst. Prof., Neurobiology and Behavior and Computer Science
Capanica, Robert R., Sc.D., Massachusetts Inst. of Technology, Prof., Neurobiology and Behavior
Chabot, Brian F., Ph.D., Duke U. Prof., Ecology and Systematics
Fiegenson, Gerald W., Ph.D., California Inst. of Technology, Assoc. Prof., Biochemistry, Molecular and Cell Biology
Ferrandino-Radin, June M., Ph.D., Tufts U. Assoc. Prof., Biochemistry, Molecular and Cell Biology/Program on Science, Technology, and Society
Gibson, Quentin H., Ph.D./D.Sc., Queen’s U. (Northern Ireland), Greater Philadelphia Professor in Biological Sciences, Biochemistry, Molecular and Cell Biology
Halpern, Bruce P., Ph.D., Brown U. Prof., Neurobiology and Behavior/Psychology
Hamill, Owen P. Ph.D., U. of New South Wales (Australia), Asst. Prof., Neurobiology and Behavior
Heppel, Leon A., Ph.D., U. of California at Berkeley, Prof., Biochemistry, Molecular and Cell Biology
Hess, George P., Ph.D., U. of California at Berkeley, Prof., Biochemistry, Molecular and Cell Biology
Hinkle, Peter C., Ph.D., New York U. Prof., Biochemistry, Molecular and Cell Biology
Howarth, Robert W., Ph.D., Massachusetts Inst. of Technology/Woods Hole Oceanographic Institution, Assoc. Prof., Ecology and Systematics
Howland, Howard C., Ph.D., Cornell U. Prof., Neurobiology and Behavior/Physiology
Hoy, Ronald A., Ph.D., Stanford U. Assoc. Prof., Neurobiology and Behavior
Kennedy, Kenneth M. A., Ph.D., U. of California at Berkeley Prof., Ecology and Systematics
Levin, Simon A., Ph.D., U. of Maryland at College Park, Charles A. Alexander Professor of Biological Sciences, Ecology and Systematics
McFarland, William N., Ph.D., U. of California at Los Angeles, Prof., Ecology and Systematics/Physiology
Podlesi, Thomas R., Ph.D., Columbia U. Prof., Neurobiology and Behavior
Power, Alison G., Ph.D., U. of Washington, Asst. Prof., Ecology and Systematics/Program on Science, Technology, and Society
Rabinowitz, Deborah, Ph.D., U. of Chicago, Assoc. Prof., Ecology and Systematics
Racker, Efrem, M.D., U. of Vienna (Austria), Albert Einstein Professor of Biochemistry, Biochemistry, Molecular and Cell Biology
Salpeter, Miriam M., Ph.D., Cornell U. Prof., Neurobiology and Behavior/Applied and Engineering Physics
Sherman, Paul W., Ph.D., U. of Michigan, Assoc. Prof., Neurobiology and Behavior
Surgenor, Robert R., Ph.D., Carleton U. (Canada), Assoc. Prof., Plant Biology
Wilson, David B., Ph.D., Stanford U. Prof., Biochemistry, Molecular and Cell Biology
Wolfner, Michael E., Cornell U. Asst. Prof., Genetics and Development
Wu, Ray, Ph.D., U. of Pennsylvania, Prof., Biochemistry, Molecular and Cell Biology

**Other Teaching Personnel**

Albrecht, Genia S., Ph.D., U. of Washington, Lecturer, Biochemistry, Molecular and Cell Biology
Eberhard, Carolyn, Ph.D., Boston U. Sr. Lecturer, Plant Biology

**New York State College of Veterinary Medicine**

Corradino, Robert A., Ph.D., Cornell U. Assoc. Prof., Physiology/Veterinary Physiology
Fortune, Joanne E., Ph.D., Cornell U. Asst. Prof., Physiology/Veterinary Physiology
Gasteiger, Edgar L., Ph.D., U. of Minnesota, Prof., Physiology/Veterinary Physiology
Hansel, William, Ph.D., Cornell U. Liberty Hyde Bailey Professor of Animal Physiology, Physiology/Veterinary Physiology/Animal Science
Lengemann, Frederick W., Ph.D., U. of Wisconsin at Madison, Prof., Physiology/Veterinary Physiology
Sharp, Geoffrey W. G., D.Sc., U. of London (England), Prof., Pharmacology
Tapper, Daniel N., Ph.D., Cornell U. Prof., Physiology/Veterinary Physiology
Wasserman, Robert H., Ph.D., Cornell U. Prof., Physiology/Veterinary Physiology/Nutritional Sciences

**College of Engineering**

**Joint Appointee**

Cisne, John L., Assoc. Prof., Geological Sciences/Biological Sciences

**Division of Biological Sciences**

Stinson, Harry T., Jr., Ph.D., Indiana U., Prof., Biological Sciences/Genetics and Development

**Division of Nutritional Sciences**

Anion, William J., Prof., Nutritional Sciences/Biochemistry, Molecular and Cell Biology
Bensadoun, Andre, Prof., Nutritional Sciences/Physiology
Kazarnoff, Michael N., Assoc. Prof., Nutritional Sciences/Biochemistry, Molecular and Cell Biology
Watford, Malcolm, Asst. Prof., Nutritional Sciences/Biochemistry, Molecular and Cell Biology
Ziversm, Donald B., Prof., Nutritional Sciences/Biochemistry, Molecular and Cell Biology

*Joint appointment with the College of Arts and Sciences.
†Joint appointment with the College of Veterinary Medicine.
‡Joint appointment with the College of Agriculture and Life Sciences.
§Joint appointment with the College of Engineering.
Facilities

Most of the academic units of the College of Engineering are centered in the eleven modern buildings located on the Joseph N. Pew, Jr. Engineering Quadrangle. Facilities for applied and engineering physics are located in Clark Hall, on the College of Arts and Sciences campus. Special facilities used in engineering include the following:

- Computer-Aided Design Instructional Facility (CADIF).
- Engineering Graphics Laboratory.

Cornell Computing Facilities. A "supercomputer" (IBM 3084/30X with FPSS64 array processors), other IBM mainframe computers, a DECsystem 2060, several VAX machines, and the latest in equipment for research on computer graphics.

Cornell High Energy Synchrotron Source. A high-energy synchrotron radiation laboratory operated in conjunction with the University's high-energy storage ring.

Laboratory of Plasma Studies. A center for interdisciplinary research in plasma physics and lasers.

Materials Science Center. Central interdisciplinary laboratories with sophisticated equipment operated by the center to support research.

National Astronomy and Ionosphere Center. The world's largest radio telescope facility, operated by Cornell University in Arecibo, Puerto Rico.

National Research and Resource Facility for Submicron Structures. A center that provides equipment and services for research in microstructure science, engineering, and technology.

SRC Center for the Program on Microscience and Technology. A "center of excellence" sponsored by the Semiconductor Research Corporation to promote research essential to the development of VLSI (very-large-scale-integrated) devices and circuits.

Ward Laboratory of Nuclear Engineering. Irradiation, isotope production, and activation analysis facilities for interdisciplinary research.

Degree Programs

Cornell programs in engineering and applied science lead to the degrees of Bachelor of Science, Master of Engineering (with field designation), Master of Science, and Doctor of Philosophy.

General academic information concerning the Bachelor of Science degree is given here under the heading "Undergraduate Study." Curricula for major studies are described under the various academic areas.

Programs leading to the Master of Science and Doctor of Philosophy degrees are administered by the Graduate School. They are described in the Announcements of the Graduate School and in the special Announcement Graduate Study in Engineering and Applied Science. The professional Master of Engineering programs and cooperative programs with the Johnson Graduate School of Management are described below.

Undergraduate Study

Bachelor of science (B.S.) degrees are offered in the following areas:

- Agricultural engineering*
- Chemical engineering
- Civil and environmental engineering
- College program
  - Computer science
  - Electrical engineering
  - Engineering physics
  - Geophysical sciences
  - Materials science and engineering
- Mechanical engineering
- Operations research and industrial engineering

Students in the College of Engineering begin their undergraduate studies in the Common Curriculum, which is administered by the faculty members of the Common Curriculum Governing Board (CCGB) through the associate dean for undergraduate programs and the Office of Advising and Counseling. Subsequently, most students enter field programs, which are described separately for each academic area. Alternatively, students may enter the College Program (described below), which permits them to pursue a course of study adapted to individual interests. A student interested in bioengineering may arrange a suitable curriculum within one of the field programs or through the College Program. Information about these options is available in the Office of Advising and Counseling, 561 Olin Hall.

Requirements for Graduation

To receive the Bachelor of Science degree, students must meet the requirements of the Common Curriculum, as set forth by the College of Engineering, as well as the requirements of the field program, as established by the school or department with which they become affiliated. The Common Curriculum is composed of courses in eight categories.

<table>
<thead>
<tr>
<th>Course Category</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Mathematics</td>
<td>16</td>
</tr>
<tr>
<td>2) Physics</td>
<td>12</td>
</tr>
<tr>
<td>3) Chemistry</td>
<td>4</td>
</tr>
<tr>
<td>4) Freshman Seminar</td>
<td>6</td>
</tr>
<tr>
<td>5) Computer programming</td>
<td>4</td>
</tr>
<tr>
<td>6) Engineering distribution (4 courses)</td>
<td>12</td>
</tr>
<tr>
<td>7) Humanities and social sciences (6 courses)</td>
<td>18</td>
</tr>
<tr>
<td>8) Electives:</td>
<td></td>
</tr>
<tr>
<td>- Approved electives</td>
<td>9</td>
</tr>
<tr>
<td>- Free electives</td>
<td>6</td>
</tr>
<tr>
<td>- Technical electives</td>
<td>6</td>
</tr>
</tbody>
</table>

Credits for courses in the field program vary between 36 and 48, depending on which program is chosen. Because of this variation, the credits needed for graduation range between 128 and 140. Two terms of physical education must be taken in the freshman year to satisfy a University requirement.

Mathematics

The normal program in mathematics includes Mathematics 191 or 193, 192, 293, and 294. Students who have little or no acquaintance with calculus take Mathematics 191. Students with some knowledge of calculus, but not enough for advanced placement, take Mathematics 193.

Physics

The normal program in physics includes Physics 112, 213, and 214. Students in the Field Program in Civil and Environmental Engineering may substitute Chemistry 208 for Physics 214.

Chemistry

Chemistry 207 is required for all students and is normally taken in the first freshman semester.

Freshman Seminars

Each semester of their freshman year, students choose a Freshman Seminar from among more than seventy courses offered by over twenty different departments in the humanities, social sciences, and expressive arts. These courses all offer the student practice in writing English prose. They also assure beginning students the benefits of a small class.

Computing

In either the first or second term of their freshman year, students take Engr 100, Introduction to Computer Programming. Before graduation they must take an additional course with a significant amount of computing applications; this may be an engineering distribution course or part of the field program. Courses that satisfy this requirement are Engr 211, Engr 222, Engr 241, Engr 264, EE 424, M&AE 489, M&AE 575, and M&AE 670. The preferred choice for students intending to enter the Field Program in Engineering Physics is Engr 264; in Chemical Engineering, Engr 222 or 224; in Computer Science, Engr 222; in Electrical Engineering, Engr 211; in Civil and Environmental Engineering, Engr 241; in Mechanical Engineering, M&AE 489, M&AE 575, or M&AE 670; and in Operations Research and Industrial Engineering, Engr 211.

Engineering Distribution

Four engineering distribution courses (12 credits) are required. These courses must be selected from four of the eight areas listed below. A student may use only one of the possible substitutions described.

1) Scientific computing
   - Engr 211, Computers and Programming
   - Engr 222, Introduction to Scientific Computing
   - Engr 241, Engineering Computation

2) Materials science
   - Engr 261, Introduction to Mechanical Properties of Materials
   - Engr 262, Introduction to Electrical Properties of Materials

3) Mechanics
   - Engr 202, Mechanics of Solids
   - Engr 203, Dynamics

   Students in the Field Program in Engineering Physics may substitute A&EP 333 for Engr 203.

4) Probability and statistics
   - Engr 260, Introduction to Engineering Probability
   - Engr 270, Basic Engineering Probability and Statistics

   Students in the Field Program in Electrical Engineering may substitute EE 310 for Engr 260.
5) Electrical sciences
  Engr 210, Introduction to Electrical Systems
  Engr 264, Computerized-Instrumentation Design

6) Thermodynamics and energy balances
  Engr 219, Mass and Energy Balances
  Engr 221, Thermodynamics

7) Earth and life sciences
  Engr 201, Introduction to the Physics and Chemistry of the Earth

8) Introduction to engineering
  Several courses are offered to introduce freshmen to the various fields of engineering. Some of these courses, which begin with Engr 100, may not be included in this Announcement. A full listing will be available at the time of registration.

Humanities and Social Sciences
  The six required courses in the humanities and social sciences must be chosen from approved courses in three categories: (a) humanities or history, (b) social sciences, and (c) expressive or language arts.
  The contents of these categories are listed below. At least three courses must be chosen from category (a), and no more than one course may be chosen from category (b).
  The student must include some courses at an advanced level; it may not be a selection of unrelated introductory courses.

a) Humanities or History
  This category includes all courses defined by the College of Arts and Sciences as humanities and history (see p. 100, group 2b and group 3a) as well as the following:
  History of Art: all courses numbered 200 and above;
  Music: all introductory courses (except 22) and all theory and history courses;
  Theater Arts: all history, literature, and theory courses.

b) Social Sciences
  This category includes all courses defined by the College of Arts and Sciences as social sciences (see p. 99, group 2a) as well as the following:
  College of Agriculture and Life Sciences: Agricultural Economics 150, 250, 332; Communication Arts 116, 120, 314, 204, 418; Education 110, 271, 317; Natural Resources 201, 407; Rural Sociology, all courses.
  College of Architecture, Art, and Planning: Architecture 181, 182, 584; City and Regional Planning 340, 400, 404, 413, 414.
  College of Arts and Sciences: Economics, all courses except 117, 318, 319, 320.
  College of Engineering: Civil and Environmental Engineering 321, 322, 325; Computer Science 305; Mechanical and Aerospace Engineering 302.
  School of Industrial and Labor Relations: all courses except those in economic and social statistics.
  Division of Nutritional Sciences: 115.

c) Expressive or Language Arts
  This category includes all courses defined by the College of Arts and Sciences as expressive arts (see p. 100, group 3b) as well as the following:
  College of Agriculture and Life Sciences: Communication Arts, all courses; Floriculture 111.
  College of Architecture, Art, and Planning: Art, all courses.
  College of Arts and Sciences: all language courses and all music and theater arts courses that emphasize performance, acting, producing, or directing.

Electives
  There are three kinds of electives: approved, free, and technical. Approved electives must be an appropriate part of an overall educational plan or objective. This constraint allows flexibility for individual goals while maintaining a coordinated, nontrivial program. A free elective may be any course in the University, although all course selections must be approved by the student’s faculty adviser.
  Technical electives are generally taken in the junior and senior years. They are usually upper-level courses in engineering, mathematics, or the physical sciences, but they also may be courses in other areas.

Office of Advising and Counseling
  From the time that students enter the college as freshmen until they become affiliated with a major field or the College Program, they are under the administration of the Office of Advising and Counseling, which implements the academic policies of the Common Curriculum Governing Board. The office also offers advising and counseling services, publishes a college newsletter, maintains files on scholarships, and provides support for students in the college.
  Students in good standing may affiliate with a field after one full year of study, and they must do so no later than the end of the second full year of study; transfer students must affiliate with a field when they matriculate.
  Engineering courses taken at the freshman and sophomore levels are listed under “Engineering Common Courses.”
  Following is a typical curriculum for freshmen. Many variations are possible, depending on the individual student’s background, advanced placement credit, and career goals. Students acquainted with calculus may take Physics 112 in term one. Students with an interest in bioengineering may take biology in terms one and two as approved electives. Students preparing to study medicine should take one year of biology and Chemistry 208 in the first year.

Term 1 Credits
  Math 101 or 193, Calculus for Engineers 4
  Chem 207, General Chemistry 4
  Engr 100, Introduction to Computer Programming, or Phys 112, Mechanics and Heat 4
  Introduction to Engineering, or an approved elective 3
  Freshman Seminar 3

Term 2 Credits
  Math 292, Calculus for Engineers 4
  Phys 112, Mechanics and Heat, or Phys 213, Electricity and Magnetism 4
  Approved elective or Engr 100, Introduction to Computer Programming, or engineering distribution course 3 or 4
  Humanities or social sciences course, or approved elective 3 or 4
  Freshman Seminar 3

Field Program
  The specific program for each field is described in the following pages. Students with a grade-point average of at least 2.0 who are making normal progress toward their degree may choose to enroll in a field program at the beginning, middle, or end of their sophomore year. Students who intend to enter the Field Program in Chemical Engineering should take Chemistry 208 and Chemistry 287–289 as approved electives in terms two and three, and Chemistry 288–289 as a field course in term four. Students intending to major in mechanical engineering should take Engr 203, and students in agricultural engineering should take Engr 221 as a field course in term three or four.
  Some fields require a specific engineering distribution course as a prerequisite for the upperclass course sequence. These fields are:
  Chemical Engineering: Engr 219
  Civil and Environmental Engineering: Engr 202
  Computer Science: Engr 211
  Electrical Engineering: Engr 210
  Engineering Physics: Engr 221
  Materials Science and Engineering: Engr 261

College Program
  Individually arranged courses of study under the College Program are possible for those whose educational objectives cannot be met by one of the regular field programs. Often the desired curriculum is in an interdisciplinary area. Each program is developed by the student in consultation with faculty advisers and must be approved by the College Program Committee, which is responsible for supervising the student’s work.
  Students apply to enter the College Program early in the second term of the sophomore year. A student may receive assistance in developing a coherent program from a faculty advisor, but no more than one course may be chosen from each of the following subject areas. If approved, the program is the curriculum contract to which the student must adhere.
  Every curriculum in the College Program, with the exception of certain faculty-sponsored programs, must comprises an engineering major and a minor. The major in any subject area may be any subject area of the College Program, the minor in a second engineering subject area, or in a correspondingly connected nonengineering area. The combinations must clearly form an engineering course scope and in substance and should include engineering design and synthesis as well as engineering sciences. In addition to 42 credits in the major and minor subjects, including at least 21 credits in engineering courses, each program includes humanities and social sciences and free electives.
  Further information about the College Program may be obtained from the Office of Advising and Counseling, 156 Olin Hall.

Dual Degree Option
  A special academic option, intended for superior students, is the dual degree program, in which both Bachelor of Science and Bachelor of Arts degrees can be earned in five years. Students registered in either the College of Engineering or the College of Arts and Sciences may apply and, after acceptance of their application, begin the dual program in their second or third year. Those interested should contact the Office of Advising and Counseling, 156 Olin Hall.

Engineering Cooperative Program
  A special program for undergraduates in most fields of engineering in which the students are expected to apply for the co-op program. (Students in computer science and agricultural engineering are eligible even though they may not be registered in the College of Engineering.) Applicants are interviewed by representatives of cooperating companies and select their work assignments from the offers they receive.
  Those students who are offered assignments and elect to join the program take their fifth-term courses at Cornell during the summer following their sophomore year and begin their first co-op work assignment that fall. They return to Cornell to complete term six with their classmates and then undertake a second work assignment with the same company the following summer. Students are expected to return to campus for their senior year and graduate with their class.
  Further information may be obtained from the Engineering Cooperative Program office, 105 Hollister Hall.
Undergraduate students interested in the six-year program should seek advice and information from the department with whose field they intend to affiliate during their upperclass years. Information about admission to either program and about special scholarship aid may be obtained from the Gradu- ate Professional Programs Committee, 109 Hollister Hall.

Academic Procedures and Policies

Advanced Placement Credit
A growing number of freshmen entering the College of Engineering are eligible to receive advanced placement (AP) credit toward degree requirements, in recognition of demonstrated academic proficiency. Students may qualify for AP credit in one of two ways:
1) by receiving sufficiently high scores on advanced placement examinations given and scored by the College Entrance Examination Board (CEEB); or
2) by receiving sufficiently high scores on Cornell's departmental placement examinations, which are given during orientation week before fall-term classes begin. Advanced placement is granted only to first-year freshmen, and the placement examinations are scored before the students begin classes.

Advanced placement credit is intended to permit students to develop more challenging and stimulating programs of study. Two ways in which freshmen may use such credit are detailed below.

1) AP credit can be used to fulfill basic requirements, thus permitting advanced study in the same subject area or enrollment in additional nontechnical elective courses.

2) In a few cases, students may receive enough AP credit to complete the degree requirement in less than eight semesters.

The college's policies concerning advanced placement credit and its use in developing undergraduate programs are fully described in the publication Advanced Placement for Engineers, which may be obtained at the Office of Advising and Counseling, 156 Olin Hall.

Transfer credit
Entering freshmen and entering transfer students who have completed courses at recognized and accredited colleges may, under certain conditions, have credits for such courses transferred to Cornell. Such courses must represent academic work in excess of that required for the secondary school diploma. No more than 72 credits may be transferred.

College courses completed under the auspices of cooperative college—high school programs may be considered for an exception to these general policies concerning advanced placement. Credit for such courses is not automatically given, however; students must be prepared to demonstrate academic proficiency by taking the appropriate CEEB or Cornell departmental placement examination, as described above.

Academic Standing
The requirements for good standing in the college vary slightly among the different divisions. Freshmen must have a grade-point average of 1.7 or higher or no failing, unsatisfactory, or incomplete grades and must be making adequate progress toward the four-year degree. Sophomore requirements are the same, except that the grade-point average must be at least 2.0. Upperclass requirements for good standing and for satisfactory performance in courses that are prerequisite for field courses vary slightly for different fields of study, as specified in the following sections.

Dean's List citations are presented each semester to engineering students with exemplary academic records. The criteria for this honor, which are determined by the dean of the college, are a term average of 3.25 or higher, with no failing or incomplete grades, no unsatisfactory grades (even in physical education), and 12 credits or more of letter grades. Students may earn Dean's List status retroactively if they meet these criteria after making up incompletes.

Standard of Performance for Mathematics
Beginning with the class of 1999, every student must attain a grade of at least C— in Mathematics 182, 293, and 294, or other courses that may be approved as substitutes for these courses. If this requirement is not met the first time a course is taken, the course must be repeated and a satisfactory grade attained before the next course in the sequence may be taken. Courses that are taken a second time in order to meet this requirement do not yield additional credit toward a degree.

S-U Grades
The option of receiving a grade of "satisfactory" or "unsatisfactory" (S-U) in a particular course, rather than a grade on a graduated scale, may be selected only in the following circumstances. Students wishing to take a course on an S-U basis have come to Cornell at least one full semester of study at Cornell, and they may take only one S-U course at a time. Only courses in the humanities and social sciences, approved electives, and free electives may be taken as S-U courses. To exercise the S-U option or change a grading option, an add/drop form signed by the instructor of the course in question and the student's faculty adviser must be filed with the registrar of the College of Engineering by the end of the first three weeks of the semester. The grading option may not be changed after this time.

The S-U policy does not apply to courses in physical education and other courses that are not taken to fulfill degree requirements. When a particular course is offered only on an S-U basis, the ordinary terms of the policy may be waived.

Residence Requirements
Candidates for an undergraduate degree in engineering must spend at least four semesters or an equivalent period of instruction as full-time students at Cornell. They must also spend at least three semesters of this time affiliated with an engineering field program or with the College Program.

Students who are not enrolled at Cornell as full-time students may take individual courses through the Extramural Division. No more than 9 credits earned through study in the Extramural Division may be used to satisfy the requirements for the bachelor's degree in engineering.

Degree candidates may spend periods of time studying away from the Cornell campus, with appropriate authorization. Such students must register for study in absentia and pay a fee. Information on programs sponsored by other universities and on procedures for direct enrollment in foreign universities is available at the Cornell Abroad Office in 170 Uris Hall. Programs should be planned in consultation with the staff of the Office of Advising and Counseling, who can provide information on credit-evaluation policies and assist in the petitioning process.

Leave of Absence and Withdrawal
Students may suspend their studies for a period of time by taking a leave of absence. A formal petition must be filed and written approval granted. Leaves of absence for more than two years are not generally granted. Credit earned while on leave of absence is subject to the limitation placed on extramural credit.
Students who voluntarily withdraw from the degree program sever all connection with the college and University, and if they subsequently wish to return, they must make a formal application for readmission.

Students who fail to register in the first three weeks of the semester, without having received a leave of absence or permission for study in absentia, may be classified, by action of the faculty, as having withdrawn.

**Engineering Job Placement**

Interviews are arranged between students and company representatives who visit the campus to recruit employees. This service, which is available to both undergraduates and graduates, can be used to find permanent or summer employment. Further information is available from the Office of Engineering Placement, 205 Hollister Hall.

**Agricultural Engineering**


**Bachelor of Science Curriculum**

Students in the Field Program in Agricultural Engineering are usually enrolled in the College of Agricultural and Life Sciences during the freshman and sophomore years, and jointly enrolled in that college and the College of Engineering in the junior and senior years (paying the engineering college tuition in the junior year). The curriculum is outlined below.

**Basic Subjects**

Math 191, 192, 293, 294, Calculus for Engineers and Engineering Mathematics 16
Chem 207, General Chemistry 4
Phys 112, 213, 214, Physics I, II, and III 12
Introductory biological sciences 6 to 8
Ag En 151, 152, computer programming and graphics 4

**Engineering distribution** (four courses, including Mechanics of Solids and Thermodynamics) 12

Humanities and social sciences (eight courses, including two in written expression, one in oral expression, and a minimum of 9 credits in humanities) 24

**Advanced and Applied Subjects**

Engineering sciences (must include Fluid Mechanics and Dynamics), Ag En 250, and four agricultural engineering courses (worth at least 12 credits), chosen from courses 350 to 399 and above 450 but excluding seminars and specific problems 33

Biological and agricultural sciences (3 credits of biological sciences required) 12
Free electives 6

Total credits 128 to 130

**Master of Engineering (Agricultural) Degree Program**

The program for the M.Eng. (Agricultural degree) is intended primarily for those students who plan to enter engineering practice rather than for those who expect to study for the doctorate. The curriculum is planned as an extension of the Cornell undergraduate program in agricultural engineering but can accommodate graduates of other engineering programs. The curriculum consists of 30 credits of courses intended to strengthen the students' fundamental knowledge of engineering and develop their design skills. Six of the required 30 credits are earned for an engineering design project that culminates in a professional-level report.

A candidate for the M.Eng. (Agricultural) degree may choose to concentrate in one of the subareas of agricultural engineering or take a broad program without specialization. The subareas are (a) power and machinery, (b) environmental engineering, (c) agricultural structures and associated systems, (d) electric power and processing, (e) energy management, (f) agricultural waste management, (g) bioengineering, (h) secondary-road design and construction, and (i) food engineering. Engineering electives are chosen from among subject areas relevant to agricultural engineering, such as thermal engineering, mechanical design and analysis, theoretical and applied mechanics, structural engineering, hydraulics, environmental engineering, soil engineering, waste management, and electronics.

**Applied and Engineering Physics**


The undergraduate engineering physics curriculum is designed for students who want to pursue careers of research or development in applied science or advanced technology. Its distinguishing feature is a focus on the fundamentals of physics, both experimental and theoretical, that have a broad applicability in engineering and science.

The industrial demand for baccalaureate graduates is high, and many students go directly to industrial positions where they work in a variety of areas, including bioengineering, computer technology, electronic-circuit design, energy conversion, geophysical analysis, high-voltage design, laser technology, microwave technology, nuclear technology, plasma physics, power engineering, and solid-state-device development. Other graduates go on for advanced study in fields such as astrophysics, atmospheric sciences, biophysics, computer engineering, condensed-matter physics, energy conversion, environmental sciences, geological engineering, laser optics, materials science and engineering, nuclear engineering, nuclear physics, oceanography, plasma physics, solid-state electronics, and statistical physics. The undergraduate program can also serve as an excellent preparation for medical school, business school, or specialization in patent law.

The engineering physics program fosters this breadth of opportunity because it both stresses the fundamentals of science and engineering and gives the student direct exposure to the application of these fundamentals. Laboratory experimentation is emphasized, and ample opportunity for innovative design is provided. Examples are A&EP 110, The Laser and Its Applications, and A&EP 401, Medical and Engineering Physics (a freshman course); A&EP 264, Computer-Optical Design (a sophomore course); A&EP 263, Electronic Circuits (a junior course); and Physics 410, Advanced Experimental Physics (a senior course).

Undergraduates who plan to enter the Field Program in Engineering Physics are advised to arrange their Common Curriculum with certain requirements and recommendations in mind. They are encouraged to take Physics 112 during their first semester, and they are advised to take Engr 221, Thermodynamics, as an engineering distribution course. Students are encouraged to study the computing applications requirement with an engineering distribution course, and A&EP 264 is recommended. Engineering physics students need to take only three engineering distribution courses, as A&EP 333, which they take in their junior year, counts as a fourth member of this category.

Students who wish to receive the Bachelor of Science degree must satisfy the requirements of the field program, outlined below, as well as the requirements of the Common Curriculum.

**Course**

A&EP 333, Mechanics of Particles and Solid Bodies 4
A&EP 355, Intermediate Electromagnetism 4
A&EP 361, Introductory Quantum Mechanics 4
A&EP 363, Electronic Circuits 4
A&EP 423, Statistical Thermodynamics 4
A&EP 434, Continuum Physics 4
Physics 410, Advanced Experimental Physics 4
Mathematics 421 or T&M 610 (applied mathematics) 4
Mathematics 422 or T&M 611 (applied mathematics) 4
Applications of quantum mechanics* 3 or 4

A third technical elective (in addition to the two required by the Common Curriculum) 1

*Courses that will satisfy this requirement are Physics 444, Nuclear and High-Energy Particle Physics; Physics 454, Introductory Solid-State Physics; A&EP 609, Low-Energy Nuclear Physics; and EE 531, Quantum Electronics.

If a scientific computing course was not selected as an engineering distribution course, one of these technical electives may be needed to satisfy the computing applications requirement. For students going on to graduate school, a third course in mathematics is recommended.

Considerable flexibility is possible in scheduling. For example, Physics 410 may be taken in term seven or in term eight. Quantum mechanics can be studied in term six as A&EP 361 or in term seven as Physics 443. The course, applications of quantum mechanics, can be taken whenever the appropriate prerequisite has been met. If scheduling conflicts arise, the school may allow substitutions of courses nearly equivalent to the listed required courses: Physics 325-326 is similar to A&EP 355-356; Physics 368 (offered in the spring) and T&M 570 are similar to A&EP 333; and advanced courses in fluid mechanics or elasticity are similar to A&EP 434.

Free and technical electives need not be all formal course work; qualified students may undertake informal study under the direction of members of the faculty. This may include research or design projects in areas in which faculty members are active. These areas include electron microscopy and diffraction, quantum electronics, solid-state and surface physics, atomic physics, applications of physics, nuclear structure, theoretical and applied mechanics, engineering physics, and plasma physics. While free electives may be selected (with the permission of the faculty adviser) from among almost all the courses offered at the University, the student is encouraged to select those that will provide further preparation in the area of technical interest. The minimum requirement is two courses or six credits.

The engineering physics student is expected to pass every course for which he or she is registered, to earn a grade of C - or better in specific required courses, and to attain each term an overall grade-point average of at least 2.3.

**Areas of Concentration**

With a total of five electives in the junior and senior years, students can tailor the upperclass program to develop areas of concentration in accordance with their individual interests. For those who look toward an industrial position after graduation, these electives can be chosen to provide the necessary background in practical engineering. An area of concentration can be developed, for example, in digital-circuit design and fabrication. A different set of electives could be selected as preparation for medical, law, or business school. For students who plan on graduate work, the electives provide an excellent opportunity to explore upper-level and graduate
Chemical Engineering


Bachelor of Science Curriculum

The undergraduate Field Program in Chemical Engineering comprises a coordinated sequence of courses beginning in the sophomore year and extending through the fourth year. Special programs in biochemical engineering and polymeric materials are available. Students who plan to enter the field program take Chemistry 208 as an approved elective during the freshman year. The program for the last three years, for students who have taken two engineering distribution courses during the first year, is as follows:

<table>
<thead>
<tr>
<th>Term 3</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math 293, Engineering Mathematics</td>
<td>3</td>
</tr>
<tr>
<td>Phys 213, Electricity and Magnetism</td>
<td>4</td>
</tr>
<tr>
<td>Chem 287–289, Physical Chemistry (approved course)</td>
<td>5</td>
</tr>
<tr>
<td>Chem E 219 (engineering distribution course)</td>
<td>3</td>
</tr>
<tr>
<td>Humanities or social sciences course</td>
<td>3</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Term 4</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math 294, Engineering Mathematics</td>
<td>4</td>
</tr>
<tr>
<td>Phys 214, Optics, Waves, and Particles</td>
<td>4</td>
</tr>
<tr>
<td>Chem 288–290, Physical Chemistry</td>
<td>5</td>
</tr>
<tr>
<td>Engineering distribution course</td>
<td>3</td>
</tr>
<tr>
<td>Humanities or social sciences course</td>
<td>3</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Term 5</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chem 357, Organic Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>Chem 251, Organic Chemistry Laboratory</td>
<td>2</td>
</tr>
<tr>
<td>Chem E 313, Chemical Engineering Thermodynamics</td>
<td>2</td>
</tr>
<tr>
<td>Chem E 323, Fluid Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>Humanities or social sciences course</td>
<td>3</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Term 6</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chem 358, Organic Chemistry†</td>
<td>3</td>
</tr>
<tr>
<td>Chem E 324, Heat and Mass Transfer</td>
<td>3</td>
</tr>
<tr>
<td>Chem E 332, Analysis of Separation Processes</td>
<td>4</td>
</tr>
<tr>
<td>Chem E 390, Reaction Kinetics and Reactor Design</td>
<td>3</td>
</tr>
<tr>
<td>Humanities or social sciences course</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Term 7</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chem E 101, Nonresident Lectures</td>
<td>0</td>
</tr>
<tr>
<td>Chem E 432, Chemical Engineering Laboratory</td>
<td>3</td>
</tr>
<tr>
<td>Chem E process or systems elective†</td>
<td>3</td>
</tr>
<tr>
<td>Electives*</td>
<td>3</td>
</tr>
<tr>
<td>Humanities or social sciences course</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Term 8</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chem E 462, Chemical Process Design</td>
<td>4</td>
</tr>
<tr>
<td>Chem E 472, Process Control</td>
<td>3</td>
</tr>
<tr>
<td>Electives*</td>
<td>3</td>
</tr>
<tr>
<td>Humanities or social sciences course</td>
<td>3</td>
</tr>
</tbody>
</table>

*The electives in terms seven and eight comprise 6 credits of technical electives and 6 credits of free electives.

1Chemistry 253 plus an applied science elective may be substituted for Chem 357–358. Applied science electives include Biological Sciences 330 and 331, Principles of Biochemistry, Chem E 673, Adsorption and Catalysis; MSE & 331, Structure and Properties of Materials; MSE & 332, Electrical and Magnetic Properties of Materials; MSE & 441, Microprocesing of Materials; MS&E 449, Microscopy of Materials; Microbiology 290, General Microbiology Lectures; any A&EP course numbered 301 or above; any Chemistry course numbered 301 or above; any Physics course numbered 300 or above.

Courses |
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Master of Engineering (Chemical) Degree Program

The professional master’s degree, M.Eng. (Chemical), is awarded at the end of one year of graduate study with successful completion of 30 credits of required and elective courses in technical fields including engineering, mathematics, chemistry, physics, and business administration. Courses emphasize design and optimization based on the economic factors that affect design alternatives for processes, equipment, and plants. The five required courses include Chem E 564, Chem E 566, and a design project (Chem E 565). General admission and degree requirements are described in the college’s introductory section.

Civil and Environmental Engineering

School of Civil and Environmental Engineering: P. Gergely, director; P. L.-F. Lii, associate director


Bachelor of Science Curriculum

The School of Civil and Environmental Engineering contains two departments, and undergraduate specialties can be arranged in a number of subject areas. The Department of Structural Engineering offers an instruction in analysis, behavior, and design of structures; structural materials; and geotechnical engineering. Within the Department of Environmental Engineering there are five subject areas: environmental and public systems, environmental quality engineering, fluid mechanics and hydrology, remote sensing, and transportation.

Students planning to enter the Field Program in Civil and Environmental Engineering are required to take Mechanics of Solids (Engr 202) during the sophomore year. * Prospective majors are strongly encouraged to obtain a “typical course schedule” from the school office.

For the Field Program in Civil and Environmental Engineering the following courses are required in addition to those required for the Common Curriculum:

<table>
<thead>
<tr>
<th>Courses</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engr 202, Mechanics of Solids*</td>
<td>3</td>
</tr>
<tr>
<td>Engr 203, Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>Engr 261, Introduction to Mechanical Properties of Materials</td>
<td>3</td>
</tr>
<tr>
<td>CEE 241, Engineering Computation†</td>
<td>3</td>
</tr>
<tr>
<td>CEE 304, Uncertainty Analysis in Engineering**</td>
<td>4</td>
</tr>
<tr>
<td>CEE 323, Engineering Economics and Systems Analysis</td>
<td>3</td>
</tr>
<tr>
<td>CEE 331, Fluid Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>CEE 341, Introductory Soil Mechanics</td>
<td>3</td>
</tr>
</tbody>
</table>

*These courses can also be used to satisfy the Common Curriculum requirements for engineering distribution courses.

1Chemistry 208 can be substituted for Phys 214.

2Engr 241 can be used to satisfy both the computer application requirement and an engineering distribution requirement of the Common Curriculum.

3Engr 270 can be substituted for CEE 304 by petition.

courses. Various programs are described in a special brochure available from the School of Applied and Engineering Physics, Clark Hall. Students interested in such programs are advised to consult with a professor active in their area or with the associate director of the school, Professor M. S. Nelkin.

Master of Engineering (Engineering Physics) Degree Program

The M.Eng. (Engineering Physics) degree may lead directly to employment in engineering design and development or may be a basis for further graduate work. Students have the opportunity to broaden and deepen their preparation in the general field of applied physics, or they may choose the more specific option of preparing for professional engineering work in a particular area such as microstructure science or physical instrumentation. A wide latitude is allowed in the choice of the required design project.

One example of a specific area of study is solid-state physics and chemistry as applied to microstructure science. Core courses in this specialty include the microcharacterization of electronic materials and the fabrication of microstructures and devices. The design project may focus on semiconductor materials, device physics, or manufacturing science.

Each individual program is planned by the student in consultation with the program chairman. The object is to provide a combination of a good general background in physics and introductory study in a specific field of applied physics. Candidates may enter with an undergraduate preparation in physics, engineering physics, or engineering. Those who have majored in physics usually seek advanced work with an emphasis on engineering; those who have majored in engineering physics or an engineering discipline generally seek to strengthen their physics base. Candidates coming from industry usually want instruction in all areas. All students granted the degree will have demonstrated competence in an appropriate core of basic physics; if this has not been accomplished at the undergraduate level, subjects such as electricity and magnetism, or classical, quantum, and statistical mechanics should be included in the program.

The general requirement for the degree is a total of 30 credits for graduate-level courses. Additional courses earned with a grade of C or better and distributed as follows:

1) a design project in applied science or engineering (not less than 6 nor more than 12 credits);

2) an integrated program of graduate-level courses, as discussed below (14 to 20 credits);

3) a required special-topics seminar course (4 credits).

The design project, which is proposed by the student and approved by the program chairman, is carried out on an individual basis under the guidance of a member of the engineering faculty. It may be experimental or theoretical in nature; if it is not experimental, a laboratory physics course is required.

The individual program of study consists of a coordinated sequence of courses focused on a specific area of applied physics or engineering. It is planned to provide an appropriate combination of physics and physics-related courses (applied mathematics, statistical mechanics, applied quantum mechanics) and engineering electives (such as courses in electrical engineering, materials science, computer science, mechanical engineering, physical or biophysics). Additional science and engineering electives may be included. Some courses at the senior level are acceptable for credit toward the degree; other undergraduate courses may be required as prerequisites but are not credited toward the degree.

Students interested in the M.Eng. (Engineering Physics) degree program should contact Professor T. N. Rhode.
Computer Science are:

<table>
<thead>
<tr>
<th>Course Work</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systems Sequences</td>
<td>8</td>
</tr>
<tr>
<td>Data Structures</td>
<td>8</td>
</tr>
<tr>
<td>CS 314, Systems and Organization</td>
<td>8</td>
</tr>
<tr>
<td>Theory sequence</td>
<td>3</td>
</tr>
<tr>
<td>CS 381, Theory of Computing</td>
<td>3</td>
</tr>
<tr>
<td>CS 382, Analysis of Algorithms</td>
<td>3</td>
</tr>
<tr>
<td>Numerical Analysis</td>
<td>3</td>
</tr>
<tr>
<td>CS 222, Scientific Computation, or CS 421, Numerical Solutions of Algebraic Equations</td>
<td>3</td>
</tr>
<tr>
<td>Electrical Engineering</td>
<td>3</td>
</tr>
<tr>
<td>EE 230, Digital Systems*</td>
<td>7 or 8</td>
</tr>
<tr>
<td>Computer science electives</td>
<td>14</td>
</tr>
</tbody>
</table>

Cooperative Program with the Johnson Graduate School of Management

Undergraduates majoring in computer science may be interested in a program that can lead to the M.B.A. degree. This program, which is sponsored jointly by the College of Engineering and the Johnson Graduate School of Management, enables students to study several subjects required for the M.B.A. degree as part of their undergraduate curriculum. Planning must begin early in the junior year. For more details, application forms, and assistance in planning a curriculum, students should contact the computer science undergraduate coordinator in Upson Hall.

Master of Engineering (Computer Science) Degree Program

The one-year program leading to the degree of M.Eng. (Computer Science) is very small; from two to five students a year are admitted. Admission standards are the same as those applied to doctoral candidates. A good undergraduate background in mathematics or computer science is required.

In the curriculum the emphasis can be on programming languages and systems, on theory of algorithms and theory of computation, on numerical analysis, on information processing, which includes databases and information organization and retrieval. Students who are interested in logical design or computer architecture will find it more appropriate to apply for admission to a graduate program in electrical engineering. The required design project could be, for example, a simple digital system, or a large system for a general purpose computer.

Electrical Engineering

<table>
<thead>
<tr>
<th>Course Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE 230, Introduction to Electrical Systems</td>
</tr>
<tr>
<td>EE 301, Electrical Signals and Systems I</td>
</tr>
<tr>
<td>EE 302, Electrical Signals and Systems II</td>
</tr>
<tr>
<td>EE 303, Electromagnetic Theory I</td>
</tr>
<tr>
<td>EE 306, Fundamentals of Quantum and Solid-State Electronics</td>
</tr>
<tr>
<td>EE 315, Electrical Laboratory I</td>
</tr>
<tr>
<td>EE 316, Electrical Laboratory II</td>
</tr>
<tr>
<td>EE 304, Electromagnetic Theory II or EE 310, Probability and Random Signals</td>
</tr>
<tr>
<td>EE electives with laboratory (2 courses)</td>
</tr>
<tr>
<td>EE electives (2 courses)</td>
</tr>
<tr>
<td>45*</td>
</tr>
</tbody>
</table>

*Credits in excess of 45 may be used to fulfill approved, technical, or non-technical requirements of the Common Curriculum.

Specialization is achieved through the four senior-year electrical engineering electives, which are selected from more than forty offerings of the school.

Bachelor of Science Curriculum

The Field Program in Computer Science is intended for students who are interested in the computing process and in the fundamental structure of algorithms, data, and languages that underlie that process. Those interested in the application of computers in some area with one area with some concentration in a related area. Most students will have achieved the necessary breadth during their undergraduate years. Some, however, may require course work beyond the graduate program's thirty-credit minimum to fulfill the breadth requirement. Students in the School of Civil and Environmental Engineering may avail themselves of a number of graduate course offerings in fields related to their major interest but outside of the school.

The School of Civil and Environmental Engineering cooperates with the the Johnson Graduate School of Management in two joint programs leading to both Master of Engineering and Master of Business Administration degrees. See the introductory section under College of Engineering.

Applications for this joint program must be submitted at the beginning of the sixth term of study.

Computer Science

<table>
<thead>
<tr>
<th>Course Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE 230, Introduction to Electrical Systems</td>
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</tr>
</tbody>
</table>

*Credits in excess of 45 may be used to fulfill approved, technical, or non-technical requirements of the Common Curriculum.

Specialization is achieved through the four senior-year electrical engineering electives, which are selected from more than forty offerings of the school.

Students majoring in electrical engineering are expected to meet the following academic standards:

1) A grade-point average of at least 2.3 every semester.
2) A grade of at least C — in each required or elective course in the field program and each course used as a technical elective.
3) Satisfactory progress in meeting the requirements for graduation, including EE 301, 303, and 315 by the end of the first semester of the junior year, and the accumulation of at least 34 credits each semester.

Master of Engineering (Electrical) Degree Program

The M.Eng (Electrical) degree prepares the student either for professional work in this area of engineering or for more advanced graduate study in a doctoral program. The M.Eng differs from the M.S. degree program mainly in its emphasis, which is on design capability rather than basic research. The 30-credit curriculum includes two-term course sequences in electrical engineering, and the design project, which alone may account for 3 to 10 credits. General admission and degree requirements are described in the college's introductory section.

Geological Sciences

**Bachelor of Science Curriculum**

Study in geological sciences is offered for students who are preparing for careers in solid earth science, for those who want a broad background in the geological sciences as preparation for careers in other fields, and for those who want to combine geological training with other sciences such as agronomy, astronomy and space science, biological sciences, chemistry, economics, mathematics, physics, or various fields of engineering. The Department of Geological Sciences is organized as an intercollege department in the College of Arts and Sciences and the College of Engineering. College of Arts and Sciences students should consult that college's section on geological sciences as well as the course listing here. Students in the College of Engineering who plan to enter the Field Programs in Geological Sciences are required to take Geol 201 (Engr 201) during their freshman or sophomore year. Those interested in geology should take Biological Sciences 101–103 and 102–104.

Geological Sciences requires six 300-level courses for the major: Geol 326, 355, 356, 375, 388, and one other 300- or 400-level course. A summer field geology course is also required.

Core courses may be taken in any reasonable sequence, except that Geol 355, which is offered in the fall, should be taken before Geol 356, which is offered in the spring. Geol 326 and 375 should be taken relatively early in the major as preparation for the summer field camp, which usually follows the junior year. Students with adequate preparation may attend field camp at an earlier time.

It is recommended that students intending to specialize in geophysics select most of their approved and technical electives from the following courses or their equivalents:

- AEPE 333, Mechanics of Particles and Solid Bodies
- AEPE 355, Intermediate Electromagnetism
- AEPE 356, Intermediate Electrodynamics
- AEPE 434, Continuum Physics
- Phys 410, Advanced Experimental Physics
- T&M 310–311, Advanced Engineering Analysis I and II

It is recommended that students intending to specialize in geochemistry (including petrology and mineralogy) select most of their approved and technical electives from the following courses or their equivalents:

- Chem 208, General Chemistry
- Chem 287–288, Introductory Physical Chemistry
- Chem 300, Quantitative Chemistry
- Chem 301, Experimental Chemistry I
- Chem 302, Experimental Chemistry II
- Chem 303, Experimental Chemistry III
- Chem 357–358, Introductory Organic Chemistry
- Chem 389–390, Physical Chemistry I and II
- MS&E 331, Structural Characterization and Properties of Materials
- MS&E 335, Thermodynamics of Condensed Systems

It is recommended that students intending to specialize in geophysics select most of their approved and technical electives from the following courses or their equivalents:

- Bio S 241, Plant Biology
- Bio S 261, General Ecology
- Bio S 274, The Vertebrates
- Bio S 281, Genetics
- Bio S 330–331, Principles of Biochemistry
- Bio S 378, Organic Evolution
- Bio S 448, Plant Evolution and the Fossil Record
- Chem 253, Elementary Organic Chemistry

It is recommended that students who want to pursue further training or immediate employment in applied geology (environmental and engineering geology, groundwater protection, geoarcheology, or geological engineering) select most of their approved and technical electives from the following courses or their equivalents, with two of the four from the same field:

- Agron 361, Genesis, Classification, and Geography of Soils
- Agron 366, Soil Chemistry
- Agron 667, Soil Physics
- CEE 341, Introductory Soil Mechanics
- CEE 611, Remote Sensing Applications
- CEE 612, Physical Environment Evaluation
- CEE 615, Digital Image Processing
- CEE 640, Foundation Engineering
- MS&E 331, Structural Characterization and Properties of Materials
- MS&E 445, Mechanical Properties of Materials
- MS&E 331, Fluid Mechanics
- MS&E 332, Hydraulic Engineering
- MS&E 351, Environmental Quality Engineering
- MS&E 353, Fluids in Porous Media and Groundwater
- OR&E 260, Introductory Engineering Probability
- OR&E 370, Introduction to Statistical Theory with Engineering Applications

Students intending to specialize in engineering geology or pursue careers in the mining industries or mineral exploration should consider including economics courses among their humanities and social sciences electives and should select most of their approved and technical electives from the groups of courses listed above for geochemistry and applied geology plus the following additional courses:

- CEE 654, Aquatic Chemistry
- CEE 741, Rock Engineering

Students who want a more general background or who want to remain uncommitted with regard to specialty must choose at least two of their three approved electives from the same field, at a level comparable to the courses listed above. The technical electives may be chosen from offerings in geological sciences or in other science or engineering fields and should be at the 300-level or above. Outstanding students may request substitution of Geol 491 and 492, Undergraduate Research, for a fourth-year technical elective.

Students intending to pursue graduate study in geology are reminded that many graduate schools require proficiency in reading the scientific literature in one or two of the three languages French, German, and Russian. Undergraduate preparation in at least one of these languages is therefore advantageous.

### Materials Science and Engineering


#### Bachelor of Science Curriculum

Students who major in materials science and engineering are required to take Engr 261, Introduction to Mechanical Properties of Materials, before the end of their junior year. They are strongly urged to take it as an engineering distribution course during their freshman or sophomore year. Students who choose to major in materials science and engineering can concentrate in any one of the following areas of specialization:

- materials science, solid state, metallurgy, ceramic materials, polymeric materials, or electrical materials.
- Specialization is achieved through the selection of free electives and should select most of their approved and technical electives from the groups of courses listed above for geochemistry and applied geology plus the following additional courses:

- MS&E 331, Structural Characterization and Properties of Materials
- MS&E 335, Thermodynamics of Condensed Systems

**Materials Science and Engineering**

- MS&E 331, Structural Characterization and Properties of Materials
- MS&E 332, Electrical and Magnetic Properties of Materials
- MS&E 333, Research Involvement I, or a field-approved elective
- MS&E 334, Research Involvement II, or a field-approved elective
- MS&E 335, Thermodynamics of Condensed Systems
- MS&E 336, Kinetics, Diffusion, and Phase Transformations

- MS&E 441, Microprocessing of Materials
- MS&E 442, Macroprocessing of Materials
- MS&E 443, Senior Materials Laboratory I
- MS&E 444, Senior Materials Laboratory II
- MS&E 445, Mechanical Properties of Materials
- MS&E 447, Materials Design Concepts I
- MS&E 448, Materials Design Concepts II

*Research involvement gives undergraduates the opportunity to work with faculty members and their research groups on current projects. The alternative field-approved elective provides students interested in industrial careers with an additional opportunity to broaden their engineering education.

#### Master of Engineering (Materials) Degree Program

Students who have completed a four-year undergraduate program in engineering or the physical sciences are eligible for consideration for admission to the M.Eng. (Materials) program, which includes the following:

1. A project qualifying for at least 12 credits and requiring individual effort and initiative. This project, carried out under the supervision of a member of the faculty, is usually experimental, although it can be analytical.
2. Six credits of courses in mathematics or applied mathematics. This requirement may be satisfied by courses T&M 310 and 311; students who have previously completed these must select other courses acceptable to the faculty.
3. Courses in materials science and engineering selected from any of those offered at the graduate level or other courses approved by the faculty, required to bring the total credits to 30.

General admission and degree requirements are described in the introductory section under College of Engineering.

### Mechanical and Aerospace Engineering


Members of the faculty of the graduate Fields of Aerospace Engineering and Mechanical Engineering are listed in the Announcement of the Graduate School.

#### Bachelor of Science Curriculum in Mechanical Engineering

The upperclass Field Program in Mechanical Engineering is designed to provide a broad background in mechanical engineering discipline as well as to offer an introduction to the many professional and technical areas with which mechanical engineers are concerned. Two main areas of concentration, corresponding to the two major streams of mechanical engineering technology, are offered in the field program.

**Mechanical and Aerospace Engineering**

**Bachelor of Science Curriculum in Mechanical Engineering**

The upperclass Field Program in Mechanical Engineering is designed to provide a broad background in mechanical engineering discipline as well as to offer an introduction to the many professional and technical areas with which mechanical engineers are concerned. Two main areas of concentration, corresponding to the two major streams of mechanical engineering technology, are offered in the field program.

**Mechanical and Aerospace Engineering**


Members of the faculty of the graduate Fields of Aerospace Engineering and Mechanical Engineering are listed in the Announcement of the Graduate School.
Engineering of fluids, energy, and heat-transfer systems has as its main concerns the experimental and theoretical aspects of fluid flow and heat transfer; the development of fossil, solar, and other energy sources for uses such as electric-power generation; industrial heating; terrestrial and aerospace transportation; and the use of heating, air conditioning, refrigeration, and noise- and pollution-control techniques to modify the human environment.

The undergraduate field program is a coordinated sequence of courses beginning in the sophomore year. During that year students who plan to enter the field of mechanical engineering take Engr 202 (also T&M 202) and Engr 203 (also T&M 203). Both of these courses are prerequisites for courses to be taken during the junior year. During either the sophomore or junior year students take Engr 221 (also M&AE 221).

The requirements for the degree of Bachelor of Science in mechanical engineering are as follows:

1) Completion of the Common Curriculum. During the upperclass years this will typically mean earning credit for two technical electives, one approved elective, two free electives, and three humanities or social sciences courses.

2) Completion of the field requirements, which consist of eight required courses (beyond Engr 202, 203, and 221, already mentioned), and five elective courses (15 credits). The seven required field courses are:

- Engr 210, Introduction to Electrical Systems
- Engr 261, Introduction to Mechanical Properties of Materials
- M&AE 323, Introduction to Fluid Mechanics
- M&AE 324, Heat Transfer
- M&AE 325, Mechanical Design and Analysis
- M&AE 326, Systems Dynamics
- M&AE 327, Mechanical Engineering Laboratory

The five elective courses consist of two alternate technical electives (6 credits), one mathematics elective (3 credits), and two field electives (6 credits). These electives are chosen from lists approved by the faculty of the Sibley School of Mechanical and Aerospace Engineering.

An additional requirement of the field program is proof of elementary competence in technical drawing. This proof may be given in a number of ways, including satisfactory completion of (a) a technical course in high school or in a community college; (b) Engineering 102, Drawing, and Engineering Design; (c) another technical drawing course at Cornell; or (d) a special examination. The proof must be given before completion of M&AE 325, Mechanical Design and Analysis. The computer applications requirement of the Common Curriculum may be satisfied by several courses, including M&AE 489, 575, and 670.

The requirements listed are those now in effect for the classes of 1985 and subsequent years and are subject to change by the faculty of the school. Requirements for earlier classes differ somewhat from the ones listed.

Introduction to Electrical Systems (EE 210) may be replaced or supplemented by Introductory Electronics (Physics 360).

A limited set of third-year courses is offered each summer under the auspices of the Engineering Cooperative Program.

More detailed materials describing the field program and possible combinations may be obtained from the Sibley School of Mechanical and Aerospace Engineering, Upson Hall.

Preparation in Aerospace Engineering

Although there is no separate undergraduate program in aerospace engineering, students may prepare for a career in this area by majoring in mechanical engineering and taking a number of aerospace engineering electives such as M&AE 405, 506, 507, 530, 531, and 536. Students may prepare for the graduate program in aerospace engineering by majoring in mechanical engineering, in other appropriate engineering specialties such as electrical engineering, engineering physics, or in the physical sciences. Other subjects recommended as preparation for graduate study include thermodynamics, fluid mechanics, applied mathematics, chemistry, and physics.

Master of Engineering (Aerospace) Degree Program

The M.Eng (Aerospace) program is designed to increase the student's facility in the application of the basic sciences to important professional problems. Because aerospace engineering is continually engaged in new areas, an essential guideline for the program is to reach beyond present-day practices and techniques. This is achieved by supplying the student with the fundamental background and the analytical techniques that will remain useful in all modern engineering developments.

General admission and degree requirements are described in the introductory section under College of Engineering.

Required courses for the M.ENG (Aerospace) degree include two related sequences from the following list.

**Core Courses Available**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>M&amp;AE 506, Aerospace Propulsion Systems</td>
<td>3</td>
</tr>
<tr>
<td>M&amp;AE 507, Dynamic Flight Vehicles</td>
<td>3</td>
</tr>
<tr>
<td>M&amp;AE 530, Fluid Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>M&amp;AE 531, Boundary Layers</td>
<td>3</td>
</tr>
<tr>
<td>M&amp;AE 536, Turbomachinery and Applications</td>
<td>3</td>
</tr>
<tr>
<td>M&amp;AE 543, Combustion Processes</td>
<td>3</td>
</tr>
<tr>
<td>M&amp;AE 559, Introduction to Controlled Fusion</td>
<td>3</td>
</tr>
<tr>
<td>M&amp;AE 569, Mechanical and Aerospace Structures I</td>
<td>3</td>
</tr>
<tr>
<td>M&amp;AE 601, Foundations of Fluid Dynamics and Aerodynamics</td>
<td>4</td>
</tr>
<tr>
<td>M&amp;AE 602, Incompressible Aerodynamics</td>
<td>4</td>
</tr>
<tr>
<td>M&amp;AE 603, Compressible Aerodynamics</td>
<td>4</td>
</tr>
<tr>
<td>M&amp;AE 608, Physics of Fluids I</td>
<td>4</td>
</tr>
<tr>
<td>M&amp;AE 609, Physics of Fluids II</td>
<td>4</td>
</tr>
<tr>
<td>M&amp;AE 630, Atmospheric Turbulence and Micrometeorology</td>
<td>4</td>
</tr>
<tr>
<td>M&amp;AE 648, Seminar on Combustion</td>
<td>4</td>
</tr>
<tr>
<td>M&amp;AE 670, Mechanical and Aerospace Structures II</td>
<td>4</td>
</tr>
<tr>
<td>M&amp;AE 704, Theory of Viscous Flows</td>
<td>4</td>
</tr>
<tr>
<td>M&amp;AE 707, Aerodynamic Noise Theory</td>
<td>4</td>
</tr>
<tr>
<td>M&amp;AE 732, Analysis of Turbulent Flows</td>
<td>4</td>
</tr>
<tr>
<td>M&amp;AE 733, Stability of Fluid Flow</td>
<td>4</td>
</tr>
<tr>
<td>M&amp;AE 734, Turbulence and Turbulent Flow</td>
<td>4</td>
</tr>
<tr>
<td>M&amp;AE 735, Computational Aerodynamics</td>
<td>4</td>
</tr>
<tr>
<td>M&amp;AE 737, Computational Heat Transfer</td>
<td>4</td>
</tr>
</tbody>
</table>

Also required are 6 credits of technical electives. A list of suggested electives is available from the M.Eng (Aerospace) program representative in Upson Hall. Further requirements include 6 credits of mathematics (T&M 616—611 or Mathematics 515—516 or the equivalent), participation in the weekly colloquium (1 credit each term), one advanced seminar (2 credits), and one professional design project (2 credits). A total of 30 credits, including the project, are required.

The school has particular strengths in the areas of fluid dynamics, aerodynamics, high-temperature gasdynamics, turbulence, chemical kinetics, aerodynamic noise, sonic boom, nonlinear waves, atmospheric flows, combustion processes in low- and high-temperature engines, and solution of flow problems by numerical methods. Professional design projects may be arranged in any of these areas.

**Master of Engineering (Mechanical) Degree Program**

The M.Eng (Mechanical) degree program provides a one-year course of study for those who want to develop a high level of competence in current technology and engineering design.

The program is designed to be flexible so that candidates may concentrate on any of a variety of specialty areas. These areas include biomechanical engineering, combustion, energy and power systems, fluid mechanics, heat transfer, materials and manufacturing engineering, mechanical systems and design, and CAD/CAM (computer-aided design/ computer-aided manufacturing). An individual student's curriculum includes a 4-credit design course, a major consisting of a minimum of 12 credits, and sufficient technical electives to meet the degree requirement of 30 credits. The design course (M&AE 590) is a formal consideration of the complete design process, including planning, cost analysis, and analytical methods. Students conduct one or more specific projects during the course. These projects may arise from individual faculty interests or from collaboration with industry. In special cases a student may petition the Master of Engineering Committee of the Sibley School of Mechanical and Aerospace Engineering to replace the design course with an independent design project. Such a project must have a mechanical engineering design focus and have the close supervision of a faculty member.

A coordinated program of courses for the entire year is agreed upon by the student and the faculty adviser. The proposed curriculum together with a statement of overall objectives and a statement of the purpose of the major is submitted for approval for the Master of Engineering Committee in the school. Any subsequent changes must also be approved by this committee.

The courses that constitute the major must be graduate-level courses in mechanical and aerospace engineering or a closely related field such as theoretical and applied mechanics. At least 21 credits of the total for the degree must be in mechanical engineering or related areas, and in general all courses must be beyond the level of those required in the undergraduate program in mechanical engineering. Credit may be granted for an undergraduate, upper-level first course in some subject area if the student has done little or no previous work in that area, but such courses must have the special approval of the Master of Engineering Committee.

The technical electives may be courses of appropriate level in mathematics, physics, chemistry, or engineering, a maximum of 6 credits may be taken in areas other than those described as part of a well-defined program leading to specific professional objectives. It is expected that all students will use technical electives to develop proficiency in mathematics beyond the minimum required of Cornell Engineering undergraduates if they have not already done so before entering the program. Courses in advanced engineering mathematics or statistics are particularly recommended.

Students enrolled in the M.Eng (Mechanical) program may take courses that also satisfy the requirements of the Cornell Manufacturing Engineering and Productivity Program (COMEPP), leading to a special dean's certificate in manufacturing engineering.

**Nuclear Science and Engineering**

Faculty members in the graduate Field of Nuclear Science and Engineering who are most directly concerned with the Master of Engineering (Nuclear) curriculum include D. D. Clark (faculty representative), K. B. Cady, H. H. Fleischmann, D. A. Hammer, and V. O. Kostroun.
Undergraduate Study

Although there is no special undergraduate field program in nuclear science and engineering, students who intend to enter graduate programs in this area are encouraged to begin specialization at the undergraduate level. This may be done by choice of electives within regular field programs (such as those in engineering physics, materials science and engineering, and civil, chemical, electrical, or mechanical engineering) or within the College Program.

College Program

The suggested curriculum for the College Program in Nuclear Engineering includes M&AE 303, 304, 305, Introduction to Nuclear Science and Engineering I, II, and III, plus two of the four courses A&EP 612, 651, 633, and 609. See the introductory section under College of Engineering for a general description of the College Program.

Master of Engineering (Nuclear) Degree Program

The two-term curriculum leading to the M.Eng (Nuclear) degree is intended primarily for individuals who want a terminal professional degree, but it may also serve as preparation for doctoral study in nuclear science and engineering. The course of study covers the basic principles of nuclear reactor systems with a major emphasis on reactor safety and radiation protection and control. The special facilities of the Ward Laboratory of Nuclear Engineering are described in the Announcement of the Graduate School. The interdisciplinary nature of nuclear engineering allows students to enter from a variety of undergraduate specializations. The required background is (1) an accredited baccalaureate degree in engineering, physics, or applied science; (2) physics, including atomic and nuclear physics; (3) mathematics, including advanced calculus; and (4) thermodynamics. Students should see that they fulfill these requirements before beginning the program. In some cases, deficiencies in preparatory work may be made up by informal study during the preceding summer. General admission and degree requirements are described in the college's introductory section.

The following courses are included in the 30-credit program:

**Fall term**
- A&EP 600, Low-Energy Nuclear Physics
- A&EP 612, Nuclear Reactor Theory I
- A&EP 633, Nuclear Engineering
- Technical elective

**Spring term**
- A&EP 651, Nuclear Measurements Laboratory
- Technical elective
- Engineering design project
- Mathematics or physics elective

Engineering electives should be in a subject area relevant to nuclear engineering, such as energy conversion, radiation protection and control, feedback control systems, magnetohydrodynamics, controlled thermonuclear fusion, and environmental engineering. The list below gives typical electives.

M&AE 651, Transport Processes II
EE 581, Introduction to Plasma Physics
EE 582, Advanced Plasma Physics
EE 471, Feedback Control Systems
EE 572, Digital Control Systems
A&EP 610, Nuclear Reactor Theory II
A&EP 652, Advanced Nuclear and Reactor Laboratory
A&EP 636, Seminar on Thermonuclear Fusion Reactors
A&EP 638, Intense Pulsed Electron and Ion Beams: Physics and Technology
MSE 705, The Effects of Radiation on Materials
NS& 484, Introduction to Controlled Fusion: Principles and Technology

Operations Research and Industrial Engineering


Bachelor of Science Curriculum

The program is designed to provide a broad and basic education in the techniques and modeling concepts needed to analyze and design complex systems and to provide an introduction to the technical and professional areas with which operations researchers and industrial engineers are concerned.

A student who plans to enter the Field Program in Operations Research and Industrial Engineering should take Introductory Engineering Probability (Engr 260). For a student who has not taken Engr 260, entry into the field program in OR&IE is possible only by permission of the associate director for undergraduate studies. In addition, it is recommended that Computers and Programming (CS 211 or Engr 211) be taken before entry into the OR&IE field program. Early consultation with an OR&IE faculty member or with the associate director for undergraduate studies can be helpful in making appropriate choices. The required courses for the OR&IE field program and the typical terms in which they are taken are as follows:

<table>
<thead>
<tr>
<th>Term 5</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>OR&amp;IE 320, Optimization I</td>
<td>4</td>
</tr>
<tr>
<td>OR&amp;IE 350, Cost Accounting, Analysis, and Control</td>
<td>4</td>
</tr>
<tr>
<td>OR&amp;IE 361, Introductory Engineering Stochastic Processes</td>
<td>4</td>
</tr>
<tr>
<td>CS 211, Computers and Programming*</td>
<td>3</td>
</tr>
<tr>
<td>Course in humanities and social sciences</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Term 6</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>OR&amp;IE 321, Optimization II</td>
<td>4</td>
</tr>
<tr>
<td>OR&amp;IE 370, Introduction to Statistical Theory with Engineering Applications</td>
<td>4</td>
</tr>
<tr>
<td>OR&amp;IE 410, Industrial Systems Analysis</td>
<td>4</td>
</tr>
<tr>
<td>Behavioral science†</td>
<td>3</td>
</tr>
<tr>
<td>Course in humanities and social sciences</td>
<td>3</td>
</tr>
</tbody>
</table>

*If CS 211 has already been taken, an appropriate three- or four-credit technical elective must be substituted.
†The behavioral science requirement can be satisfied by any one of several courses of an advanced nature, including Graduate School of Management (GSM) NCC 504 (only offered in the fall), which is recommended for those contemplating the pursuit of a graduate business degree, and Industrial and Labor Relations 120, 121, 151, and 320. The adviser must approve the selection in all cases.

The basic senior-year program, from which individualized programs are developed, consists of the following courses:

**Minimum credits**
- OR&IE 580, Digital Systems Simulation
- Three upperclass OR&IE electives as described below
- Two technical electives
- Two courses in humanities and social sciences
- Two free electives

Available OR&IE electives are as follows:

- Industrial systems: OR&IE 417, 421, 451, and 562 and GSM MBA 601 and 641*

  Optimization methods: OR&IE 431 and 435
  Applied probability and statistics: OR&IE 462, 471, 472, 561, 563, and 570

  *No more than one course in the Graduate School of Management may be taken as an OR&IE elective.

Scholastic requirements for the field are a passing grade in every course, an overall average of at least 2.0 for each term the student is enrolled in the school, an average of 2.0 or better for OR&IE field courses, and satisfactory progress toward the completion of the degree requirements. The student’s performance is reviewed at the conclusion of each term.

Master of Engineering (OR&IE) Degree Program

This one-year professional degree program stresses applications of operations research and industrial engineering and requires completion of a project. The course work centers on additional study of analytical techniques, with particular emphasis on engineering applications, especially in the design of new or improved man-machine systems, information systems, and control systems.

General admission and degree requirements are described in the introductory "Degree Programs" section. The M.Eng (OR&IE) program is integrated with the undergraduate Field Program in Operations Research and Industrial Engineering. Also welcome are students with an OR&IE field program from other institutions. Students interested in the manufacturing systems engineering option and the manufacturing internship program should obtain further information regarding program requirements from the office of the Cornell Manufacturing Engineering and Productivity Program, in 319 Upson Hall.

I. For matriculants with preparation comparable to that provided by the undergraduate Field Program in Operations Research and Industrial Engineering:

<table>
<thead>
<tr>
<th>Fall term</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>OR&amp;IE 516, Case Studies</td>
<td>4</td>
</tr>
<tr>
<td>OR&amp;IE 893, Applied OR&amp;IE Colloquium</td>
<td>1</td>
</tr>
<tr>
<td>OR&amp;IE 599, Project</td>
<td>minimum of 4</td>
</tr>
<tr>
<td>Three technical electives</td>
<td>9</td>
</tr>
</tbody>
</table>

The electives specified above will normally be chosen from graduate courses offered by the School of Operations Research and Industrial Engineering. A minimum of 30 credits must be taken to complete the program.

II. For matriculants from other fields who minimally fulfill the prerequisite requirements (students who have the equivalent of OR&IE 370, 520, and 523 will take two technical electives in their place):

<table>
<thead>
<tr>
<th>Fall term</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>OR&amp;IE 370, Introduction to Statistical Theory with Engineering Applications</td>
<td>4</td>
</tr>
<tr>
<td>OR&amp;IE 520, Operations Research I</td>
<td>4</td>
</tr>
<tr>
<td>OR&amp;IE 516, Case Studies</td>
<td>4</td>
</tr>
<tr>
<td>OR&amp;IE 580, Digital Systems Simulation</td>
<td>4</td>
</tr>
<tr>
<td>OR&amp;IE 893, Applied OR&amp;IE Colloquium</td>
<td>1</td>
</tr>
<tr>
<td>OR&amp;IE 599, Project</td>
<td>minimum of 4</td>
</tr>
<tr>
<td>Three technical electives</td>
<td>9</td>
</tr>
</tbody>
</table>

Students fulfill the project requirement by working as part of a group of no more than four students on an operational systems problem that actually exists in some organization. Appropriate problems are suggested by manufacturing firms, retailing organizations, service organizations, government agencies, and educational institutions.
Cooperative Program with the Johnson Graduate School of Management

Undergraduates majoring in operations research and industrial engineering may be interested in a cooperative program at Cornell that leads to both Master of Engineering and Master of Business Administration (M.B.A.) degrees. With appropriate curriculum planning such a combined B.S. – M.Eng. – M.B.A. program can be completed in six years.

An advantage for OR&IE majors is that they study, as part of their undergraduate curriculum, several subjects that are required for the M.B.A. degree. (This is because modern management is concerned with the operation of production and service systems, and much of the analytical methodology required to deal with operating decisions is the same as that used by systems engineers in designing these systems.) An early start on meeting the business-degree requirements permits students accepted into the cooperative program to earn both the M.Eng. (OR&IE) and M.B.A. degrees in two years rather than the three years such a program would normally take.

The details of planning courses for this program should be discussed with the admissions office of the Johnson Graduate School of Management. In accordance with this program the candidate would qualify for the B.S. degree at the end of four years, the M.Eng. (OR&IE) degree at the end of five years, and the M.B.A. degree at the end of six years.

Further details and application forms may be obtained at the office of the School of Operations Research and Industrial Engineering, Uson Hall, and the admissions office of the Johnson Graduate School of Management.

Theoretical and Applied Mechanics


Undergraduate Study

The Department of Theoretical and Applied Mechanics is responsible for courses in engineering mechanics and engineering mathematics, some of which are part of the Common Curriculum.

College Program in Engineering Science

A student may enroll in the College Program in Engineering Science, which is sponsored by the Department of Theoretical and Applied Mechanics. The College Program is described in the section on undergraduate study in the College of Engineering.

Engineering Courses

Courses offered in the College of Engineering are listed under the various departments and schools.

Courses are identified with a standard abbreviation followed by a three-digit number.

Engineering Common Courses

Agricultural Engineering
Applied and Engineering Physics
Chemical Engineering
Civil and Environmental Engineering
Computer Science

Electrical Engineering
Geological Sciences
Materials Science and Engineering
Mechanical and Aerospace Engineering
Nuclear Science and Engineering
Operations Research and Industrial Engineering
Theoretical and Applied Mechanics

Undergraduate Study

The Department of Theoretical and Applied Mechanics is responsible for courses in engineering mechanics and engineering mathematics, some of which are part of the Common Curriculum.

College Program in Engineering Science

A student may enroll in the College Program in Engineering Science, which is sponsored by the Department of Theoretical and Applied Mechanics. The College Program is described in the section on undergraduate study in the College of Engineering.

Engineering Courses

Courses offered in the College of Engineering are listed under the various departments and schools.

Courses are identified with a standard abbreviation followed by a three-digit number.

Engineering Common Courses

Agricultural Engineering
Applied and Engineering Physics
Chemical Engineering
Civil and Environmental Engineering
Computer Science

Electrical Engineering
Geological Sciences
Materials Science and Engineering
Mechanical and Aerospace Engineering
Nuclear Science and Engineering
Operations Research and Industrial Engineering
Theoretical and Applied Mechanics

Undergraduate Study

The Department of Theoretical and Applied Mechanics is responsible for courses in engineering mechanics and engineering mathematics, some of which are part of the Common Curriculum.

College Program in Engineering Science

A student may enroll in the College Program in Engineering Science, which is sponsored by the Department of Theoretical and Applied Mechanics. The College Program is described in the section on undergraduate study in the College of Engineering.

Engineering Courses

Courses offered in the College of Engineering are listed under the various departments and schools.

Courses are identified with a standard abbreviation followed by a three-digit number.

Engineering Common Courses

Agricultural Engineering
Applied and Engineering Physics
Chemical Engineering
Civil and Environmental Engineering
Computer Science

Electrical Engineering
Geological Sciences
Materials Science and Engineering
Mechanical and Aerospace Engineering
Nuclear Science and Engineering
Operations Research and Industrial Engineering
Theoretical and Applied Mechanics

Engineering Common Courses

100 Introduction to Computer Programming (also CS 100) Fall, spring, summer. 4 credits. The course content is the same as that of CS 100. 2 lecs, 1 lab, 3 rec (optional), 3 evening exams. For description see CS 100.

102 Drawing and Engineering Design (also M&AE 102) Fall, spring. 1 credit. Half-term course offered twice each semester. Enrollment limited. Recommended for students without previous mechanical drawing experience. S-U grades optional. 2 lecs, 1 lab.

110 The Laser and Its Applications in Technology, Science, and Medicine (also A&EP 110) Fall, spring. 1.5 credits. Preliminary course offered twice each semester. Enrollment limited. Recommended for students without previous mechanical drawing experience. S-U grades optional. 2 lecs, 1 lab.

111 Elements of Materials Science (also MS&E 201) Fall, spring. 3 credits. Autotutorial. Relations between atomic structure and macroscopic properties of such diverse materials as metals, ceramics, and polymers. Properties discussed include magnetism, superconductivity, insulation, semiconductivity, mechanical strength, and plasticity. Applications to microelectronics, desalination by reverse osmosis, superconducting power transmission lines, synthetic bones and joints, etc. Extensive use of slides, tapes, and films.

112 Introduction to Chemical Engineering (also Chem E 112) Fall, spring. 3 credits. Limited to freshmen. 2 lecs, 1 rec. R. K. Finn, F. Rodriguez. This course is designed to acquaint students with the scope of chemical engineering. Topics such as polymers, fluid flow, and plant design will be introduced at an elementary level. Quantitative discussions buttressed by lecture demonstrations will show how the engineering approach differs from a purely scientific one. The rapid solving of numerical problems is emphasized on homework and tests.

113 Computer-aided Design in Environmental Systems (also CEE 113) Fall. 3 credits. 3 lecs. A. J. Richardson, C. A. Shoemaker. Planning, design, and management of environmental systems. Emphasis on use of computer-aided techniques, including interactive computer graphics. Sample problems will include flood control, transportation network design, water quality management, and nuclear waste disposal. The objective of the course is to provide students with an opportunity to experiment with alternative design and management strategies in several areas of environmental engineering.

115 Engineering Application of Operations Research (also OR&IE 115) Fall, spring. 3 credits. 2 lecs, 1 lab. Techniques for optimal decision making and engineering design. Computer graphics and mathematical modeling. Allocation of scarce resources, simulation of complex systems, design and analysis of networks, strategies in competitive games. Engineering applications and problem solving will be stressed.

116 Modern Structures (also CEE 116) Spring. 3 credits. 2 lecs. R. N. White A major structure, such as a skyscraper, bridge, ship, or aircraft, participates in a highly complex system together with surrounding objects, materials, and influences. Its construction or manufacture must honor financial and other feasibility constraints; it must function properly to fulfill its intended purpose; it must be safe for its users; and it should be aesthetically appealing. This course focuses on how typical structural systems behave under loadings, how they are designed, how materials are selected, and how fabrication is carried out. There will be readings, discussions, lectures, slides, films, laboratory demonstrations, and exercises. The George Winter Structural Engineering Laboratory in Thurston Hall is used for demonstrations and experiments. Computer graphics (at CADIF) are utilized for structural analysis.

117 Introduction to Mechanical Engineering (also M&AE 117) Fall. 3 credits. Consists of two half-term minicourses chosen from a list of three. Two of these minicourses alternate; the third (Drawing and Engineering Design) is offered every half term but has limited enrollment. 3 lecs, 1 lab.

118 Introduction to Bioengineering (also Chem E 118) Fall. 3 credits. 2 lecs, 1 lab. W. L. Obricht An introduction to the methods of engineering analysis and design in emerging areas of biotechnology. Basic principles of fluid flow, diffusion, biochemical reactor design, and separation processes are presented and applied to selected problems in biochemical and biomedical engineering. Students conduct a few laboratory experiments that illustrate concepts presented in class.

119 Introduction to Manufacturing Engineering (also M&AE 119 and OR&IE 119) Spring. 3 credits. Not offered 1986—87. 2 lecs, 1 lab. Engineering considerations in the design, manufacturing, distribution, and service of products. Transformation from functional requirements to material and processing techniques. Engineering problems in the design and management of a manufacturing facility and distribution channels. Visits will be made to local industries.

121 Fission, Fusion, and Radiation (also NS&E 121) Spring. 3 credits. 2 lecs, 1 lab demonstration. A lecture, demonstration, and laboratory course on (1) the physical nature and biological effects of nuclear radiation; (2) the benefits and hazards of nuclear energy; (3) light-water reactors, breeder reactors, and fusion reactors; and (4) the uses of nuclear radiation in physical and biological research. The laboratory work
and demonstrations involve criticality and the control of Cornell's two research reactors; detection of, and protection against, nuclear radiation; neutron activation analysis using gamma-ray spectroscopy; and plasma sources and devices.

122 Composite Materials: Design and Applications (also MSE 122) Fall. 3 credits.
2 lecs, 1 lab or rec. Composites are combinations of materials arranged to produce new, superior materials. Wood and bone are natural composites; because of their lightness and strength, carbon-fiber composites are used in cars, tennis rackets, and Lear airplanes. This course deals with the general principles that lead to better materials. There will be a detailed study of the design and manufacture of practical synthetic composites. Students will make and test their own composites in the laboratory. Results will be related to the use of composites in space-age vehicles.

201 Introduction to the Physics and Chemistry of the Earth (also Geol 201) Spring. 3 credits.
Prerequisite: Mathematics 191 or 193, Physics 112, and Chemistry 207. 2 lecs; 1 rec, lab, or field trip. D. E. Kiang. Formation of the solar system, accretion and evolution of the earth, radioactive isotopes and the geological time scale, rocks and minerals, the continents and the oceans, erosion and sedimentation, weathering processes, the earth as a heat engine, volcanism, seismology, gravity, magnetism, plate tectonics, deformation of the earth's crust, comparative planetology.

202 Mechanics of Solids Fall, spring. 3 credits.
Prerequisite: coregistration in Mathematics 293.
2 lecs, 1 rec, 4 labs each semester, evening exams. Principles of statics, force systems, and equilibrium; frameworks; mechanics of deformable solids, stress, strain, statically indeterminate problems; mechanical properties of engineering materials; axial, shear force, bending moment, singularity functions; plane stress; Mohr's circle; bending and torsion of bars; buckling and plastic behavior.

203 Dynamics Fall, spring. 3 credits.
Prerequisite: coregistration in Mathematics 294.
2 lecs, 1 rec, 4 labs each semester, evening exams. Newtonian dynamics of a particle, systems of particles, a rigid body. Kinematics, motion relative to a moving frame. Impulse, momentum, angular momentum, energy. Rigid-body kinematics, angular velocity, moment of momentum, the inertia tensor. Euler equations, the gyroscope.

210 Introduction to Electrical Systems (also EE 210) Fall, spring. 3 credits.
Prerequisites or corequisites: Mathematics 293 and Physics 213.
3 lecs and optional tutorial secs. Circuit elements and laws, analysis techniques, operational amplifiers. Response of linear systems, with an introduction to complex frequency and phasors, forced response, average power, transfer function, pole-zero concepts, and the frequency spectrum. Terminal characteristics of diodes and transistors, linear models, bias circuits, and frequency response of small-signal amplifiers.

211 Computers and Programming (also CS 211) Fall, spring, summer. 3 credits.
Prerequisite: either CS 100 or equivalent programming experience.
2 lecs, 1 rec, 2 evening exams. For description see CS 211.

219, 220 Mass and Energy Balances (also Chem E 219, 220) 219: fall; 220: summer. 3 credits.
Prerequisite: one year of freshman chemistry. 219 is recommended for students planning to enter the Field Program in Chemical Engineering. R. G. Thorpe. Engineering problems involving material and energy balances. Batch and continuous reactive systems in the steady and unsteady states. Humidification processes. Chem E 220 differs from 219 in that it uses only self-paced audiovisual instruction at the convenience of the student. A minimum of seventy clock hours of audiovisual instruction is required to master the subject matter. Student performance in 220 is evaluated by nine tests, two preliminary examinations, and a final examination; superior students may earn exemption from the final examination.

221 Thermodynamics Fall, spring. 3 credits.
Prerequisites: Mathematics 191-192 and Physics 112. 3 lecs. The definitions, concepts, and laws of thermodynamics. Applications to ideal and real gases, multiphase pure substances, gaseous reactions. Heat-engine and heat-pump cycles, with an introduction to energy-conversion systems.

222 Introduction to Scientific Computation (also CS 222) Spring. 3 credits.
Prerequisites: CS 100 and Mathematics 112, 122, or 152.
2 lecs, 3 evening exams. Students write FORTRAN programs to solve representative problems from elementary calculus. Emphasis is on the design of numerical software that is efficient, reliable, stable, and portable. Special topics include supercomputing and parallel computation.

241 Engineering Computation (also CEE 241) Fall, spring. 3 credits.
Prerequisites: CS 100, and Mathematics 293. Corequisite: Mathematics 294.

260 Introductory Engineering Probability (also ORIE 260) Fall, spring. 3 credits.
Prerequisite: first-year calculus.
3 lecs. The basic tools of probability and their use in engineering. 260 may be the last course in probability for some students, or it may be followed by ORIE 361. Introduction to Engineering, Statistical Processes I, or by ORIE 370. Introduction to Statistical Theory with Engineering Applications. Definition of probability; random variables; probability distributions, density functions, expected values; jointly distributed random variables; distributions such as the binomial, Poisson, and exponential that are important in engineering and how they arise in practice; limit theorems.

261 Introduction to Mechanical Properties of Materials Fall, spring. 3 credits.
2 lecs, 1 rec or lab. The relation of elastic deformation, plastic deformation, and fracture properties to structure and defects on a microscopic scale in metals, ceramics, polymers, and composite materials. Design and processing of materials to achieve high modulus, clamping capacity, hardness, fracture strength, creep resistance, and fatigue resistance. Flaw-tolerant design methods using fracture mechanics.

262 Introduction to Electrical Properties of Materials Spring. 3 credits.
2 lecs, 1 rec or lab. Electrical and structural properties of semiconductors, oxide layers, and metal films that are used in modern integrated circuits. Crystal structure, growth of semiconductors, deposition of thin films, electrical conduction, p-n junctions, transistors, and light-emitting diodes. Interplay between structural and electrical properties and their application to the design of semiconductor devices and integrated circuits.

264 Computerized-Instrumentation Design (also A&EP 264) Fall, spring. 3 credits. Prerequisites: Engr 100 or CS 100, and Physics 213, or the equivalent.
1 lec, 1 lab. Design techniques for incorporating small computers into experimental apparatus. Experiments in elementary physics are performed with appropriate sensors wired to computer interfaces, under program control that employs routines written in BASIC and ASSEMBLY languages. Analog-to-digital converters, digital-to-analog converters, optical encoders, and stepping motors are used. Graphic display of data and theoretical fit are emphasized.

270 Basic Engineering Probability and Statistics Fall, spring. 3 credits. Students who intend to enter the upperclass Field Program in Operations Research and Industrial Engineering should take Engr 260 instead of this course. 3 lecs, evening prelims. At the end of this course a student should command a working knowledge of basic probability and statistics as they apply to engineering work. For students who want to have greater depth in probability and statistics, a course in probability (ORIE 260) followed by a course in statistics (ORIE 370) is recommended.

Agricultural Engineering

Courses in agricultural engineering will be found in the section listing the offerings of the College of Agriculture and Life Sciences.

Applied and Engineering Physics

110 The Laser and Its Applications in Science, Technology, and Medicine (also Engr 110) Fall, spring. 3 credits. This is a course in the Introduction to Engineering series.
2 lecs. T. A. Cool, A. Lewis. For description see Engineering Common Courses.

264 Computerized-Instrumentation Design (also Engr 264) Fall, spring. 3 credits. Prerequisites: Engr 100 or CS 100, and Physics 213 or the equivalent.
1 lec, 1 lab. For description see Engineering Common Courses.

303 Introduction to Nuclear Science and Engineering I (also NS&E 303) Fall. 3 credits.
Prerequisite: Physics 214 or Mathematics 294.
3 lecs. V. O. Kostroum. For description see NS&E 303.

304 Introduction to Nuclear Science and Engineering II (also NS&E 304) Spring. 3 credits.
Prerequisite: A&EP 303.
3 lecs. D. D. Clark. For description see NS&E 304.

[306 Introduction to Biophysics Fall. 3 credits. S-U grades optiona. Prerequisite: permission of instructor. Not offered 1986-87.
3 lecs. A. Lewis. A systematic quantitative introduction to biophysics as an interdisciplinary area that applies the physical sciences to biological systems. Intended for advanced undergraduates in physics, engineering, chemistry, and the biological sciences. The unity of the physical, chemical, and biological sciences is stressed. Six topics will be chosen from among the following seven: photosynthetic energy conversion, protein dynamics as exemplified in oxygen delivery, electron tunneling in metabolic electron transport, the role of cell membranes, visual and auditory perception, biophysical applications of genetic engineering, and physics of movement.]
Analysis of various technological and engineering problems in design and construction of fusion reactors. Topics include basic reactor schemes, materials, mechanical and heat-transfer problems, radiation and safety, superconducting magnets, energy conversion, plasma impurities, and economics.

638 Intense Pulsed Electron and Ion Beams: Physics and Technology Spring. 2 credits. Prerequisites: EE 581 or 582 (A&EE 606, 607) or equivalent, or permission of instructor. D. A. Hammer. Topics include (1) theoretical aspects of intense electron and ion beams, such as equilibration and stability; (2) technology of intense beam production, such as pulsed-power generator principles, and electron and ion diode operation; and (3) applications of intense beams, such as to controlled fusion, microwave generation, and laser pumping. Extensive discussion of experimental results.

651 Nuclear Measurements Laboratory Spring. 3 credits. Prerequisite: some nuclear physics. Two 2-hr.-afternoon periods plus 1 lecture. D. D. Clark. Lectures on interaction of radiation with matter, radiation biology, and nuclear instruments and measurements. Fifteen experiments are available (from which eight are selected) on nuclear physics, radiation instrumentation and measurements, activation analysis, neutron moderation, and reactor physics and engineering; the subcritical reactor assembly and TRIGA reactor are used. At the level of Nuclear Radiation Detection, by Price, and Radiation Detection and Measurement, by Knoll.

662 Microcharacterization Fall. 3 credits. Prerequisites: Physics 112, 213, and 214, or an introductory course in modern physics. The basic physical principles underlying the many modern microanalytical techniques available for characterizing materials. Discussion centers on the physics of the interaction process by which the characterization is performed, the advantages and limitations of each technique, and the instrumentation involved in each characterization method (including charged-particle optics when appropriate).

666 Microprocessing of Materials Spring. 3 credits. Several field trips. An introduction to the fundamentals of fabricating and patterning thin-film materials and surfaces, with emphasis on electronic materials. Vacuum and plasma thin-film deposition processes. Photon, electron, X-ray, and ion-beam lithography. Techniques for pattern replication by plasma and ion processes. Emphasis is on understanding the physics and materials science that define and limit the various processes.

681–689 Special Topics in Applied Physics Topics, instructors, and credits to be announced each term. Typical topics include quantum superconducting devices, physics of semiconductor devices, nonlinear fluctuations, biophysical processes, molecular fluorescence.

711 Principles of Diffraction (also MS&E 610) Fall. 3 credits. Offered alternate years. B. W. Batterman. Introduction to diffraction phenomena as applied to solid-state problems. Scattering and absorption of neutrons, electrons, and X-ray beams, with particular emphasis on synchrotron radiation X-ray sources.

Chemical Engineering

101 Nonresident Lectures Fall. No credit. 1 lec. R. L. VonBerg. Given by lecturers invited from industry and from selected departments of the University to assist students in their transition from college to industrial life.

112 Introduction to Chemical Engineering (also Engr 112) Fall, spring. 3 credits. Limited to freshmen. 2 lecs. 1 rec. R. K. Finn, F. Rodriguez. For description see Engineering Common Courses.

118 Introduction to Bioengineering (also Engr 118) Fall. 3 credits. 2 lecs. 1 lab. W. L. Obbracht. For description see Engineering Common Courses.

219 Mass and Energy Balances (also Engr 219) Fall. 3 credits. Prerequisite: one year of freshman chemistry or permission of instructor. 3 lecs. 1 computing session. R. G. Thorpe. For description see Engineering Common Courses.

220 Mass and Energy Balances (also Engr 220) Summer. 3 credits. Prerequisite: one year of freshman chemistry. Intended for students who cannot take Chem E 219.


323 Fluid Mechanics Fall. 3 credits. Prerequisites: Chem E 219 and engineering mathematics sequence. 3 lecs. 1 computing session. P. H. Steen. Fundamentals of fluid mechanics. Macroscopic and microscopic balances. Applications to problems involving viscous flow.

332 Analysis of Separation Processes Spring. 4 credits. Prerequisite: Chem E 323. 3 lecs. 1 computing session. W. L. Olbracht. Analysis of separation processes involving phase equilibria and rate of mass transfer; some use of the digital computer. Phase equilibria; binary, multicomponent, and extractive distillation; liquid-liquid extraction; gas absorption; crystallization.

390 Reaction Kinetics and Reactor Design Spring. 3 credits. Prerequisites: Chem E 313 and 323. 3 lecs. A. B. Antons. A study of chemical reaction kinetics and principles of reactor design for chemical processes.

432 Chemical Engineering Laboratory Fall. 3 credits. Prerequisites: Chem E 323, 324, and 332. 2 lecs. 1 lab. Staff. Laboratory experiments in fluid dynamics, heat and mass transfer, other operations. Correlation and interpretation of data. Technical report writing.

461 Analysis of Chemical Processes Fall. 3 credits. Prerequisite: Chem E 390. 3 lecs. R. L. VonBerg. Study of some important chemical processes, covering sources of raw materials, analysis of reaction conditions, and product purification.

462 Chemical Process Design Spring. 4 credits. Prerequisite: Chem E 432. R. L. VonBerg and staff. A consideration of process and economic alternatives in selected chemical processes; design and assessment.

472 Process Control Spring. 3 credits. Prerequisites: Chem E 324 and 390. 3 lecs. 1 lab. P. Harriott. Analysis of process dynamics and design of control systems that will maintain output specifications in spite of input disturbances.

490 Undergraduate Projects in Chemical Engineering. Variable credit. Research or studies on special problems in chemical engineering.

564 Design of Chemical Reactors and Multiphase Contacting Systems Spring. 3 credits. Prerequisite: Chem E 390 or equivalent. 3 lecs. P. Harriott. Design, scale-up, and optimization of chemical reactors with allowance for heat and mass transfer.
nonideal flow, and catalyst aging. Selection of systems for gas-liquid contacting, including stirred tanks, fluidized beds, and fixed beds.

565 Design Project Spring. 3 or 6 credits. Prerequisite: Chem E 564. Required for students in the M.Eng. (Chemical) program. Staff. Design study and economic evaluation of a chemical processing facility, alternative methods of manufacture, raw-material preparation, food processing, waste disposal, or some other aspect of chemical processing.

566 Computer-aided Process Design Spring. 3 credits. Prerequisite: concurrent registration in 462 or a previous course in process design. 3 lecs. G. F. Scheele. An introduction to the synthesis and use of computer systems for steady-state simulation and optimization of chemical processes. Synthesis of heat exchanger networks and separation systems.

590 Special Projects in Chemical Engineering Variable credit. Limited to graduate students. Non-thesis research or studies on special problems in chemical engineering.

611 Phase Equilibria Fall, spring. 3 credits. Prerequisite: physical chemistry. 3 lecs. R. G. Thorne. A detailed study of the pressure-temperature-composition relations in binary and multicomponent heterogeneous systems in which several phases are of variable composition. Prediction of phase data.

621 Petroleum Refining Spring. 3 credits. Prerequisite: Chem E 590. 3 lecs. H. F. Wiegandt. A study of processes used to refine petroleum. Recent process developments, including those for selected petrochemicals.

640 Polymeric Materials Fall. 3 credits. 3 lecs. F. Rodriguez. Chemistry and physics of the formation and characterization of polymers. Principles of fabrication.


642 Polymeric Materials Laboratory Spring. 2 or 3 credits. Prerequisite: Chem E 640. F. Rodriguez. Experiments in the formation, characterization, fabrication, and testing of polymers.

643 Introduction to Bioprocess Engineering Fall. 3 credits. Prerequisite: Chem E 390 or permission of instructor. No prior background in the biological sciences required. 3 lecs. R. K. Finn, M. L. Shuler. A discussion of principles involved in using microorganisms and enzymes for processing. Application to food and fermentation industries and to biological waste treatment.

645 Advanced Concepts in Biological Engineering. Spring. 3 credits. Prerequisite: Chem E 643 or equivalent or permission of instructor. 3 lecs. D. S. Clark, M. L. Shuler. Fundamentals of biochemical engineering science with emphasis on enzyme processing, mathematical models of cell growth, bioreactors, product recovery, bioprocesses, the use of tissue culture, and genetically modified organisms.

646 Controlled Cultivation of Microbial Cells Spring (January intersession). 3 credits. Prerequisite: Microbiology 291 or equivalent. R. K. Finn. A projects course. Use of batch- and continuous-stirred tanks to explore the physiology of microorganisms under conditions simulating industrial practice.

648 Polymers in Electronics and Related Areas Spring. 3 credits. Prerequisite: 640 or permission of instructor. 3 lecs. F. Rodriguez. Applications of polymers as resists for microolithography, as insulators, and as conductors. Radiation effects, polymer synthesis, and surface characterization. Additional special topics may be covered.

661 Air Pollution Control Fall. 3 credits. 3 lecs. P. Harriott. Origin of air pollutants. Design of equipment for removal of particulate and gaseous pollutants formed in combustion and chemical processing.

673 Adsorption and Catalysis Spring. 2 credits. R. P. Merrill. The physics and chemistry of adsorption on reactive surfaces and catalysis. Emphasis on the use of modern spectroscopic techniques to determine the geometric structure, electronic structure, and reaction sequences on well-defined surfaces. Discussion of several catalytic systems.

711 Advanced Chemical Engineering Thermodynamics Fall. 3 credits. Prerequisite: Chem E 313 or equivalent. 3 lecs. K. E. Gubbinis. Application of general thermodynamic methods to advanced problems in chemical engineering. Evaluation, estimation, and correlation of properties; chemical and phase equilibrium.

713 Applied Chemical Kinetics Fall. 3 credits. Prerequisite: Chem E 390 or equivalent. Stoichiometry of multiple reactions, complex monomolecular kinetics, lumping analysis in monomolecular and continuous reaction mixtures, nonideal reactors, kinetics of catalyzed reactions, multiple steady states in chemical reactors, principles of heterogeneous catalysis, selected topics in biochemical engineering kinetics.


741 Selected Topics in Biochemical Engineering Fall, spring. 1 credit (may be repeated for credit). Prerequisite: Chem E 643 or permission of instructor. D. S. Clark, R. K. Finn, M. L. Shuler. Discussion of current topics and research in biochemical engineering for graduate students.


753 Dynamics, Stability, and Bifurcation in Chemical Engineering Research Fall. 3 credits. Prerequisite: Chem E 751 or equivalent. 3 lecs. P. H. Stern. Elements of bifurcation theory. Branch-following techniques. Stability of discrete and continuous systems. Application to population-dynamics, reaction-diffusion, and hydrodynamic systems using software for continuation problems.

772 Theory of Molecular Liquids Fall. 3 credits. Prerequisite: Chem E 711 or equivalent. Offered alternate years. Not offered 1986–87. K. E. Gubbinis. Theory of intermolecular forces, and equilibrium statistical mechanics for nonspherical molecules. Distribution functions. Applications to thermodynamics of such fluids using integral equation and perturbation theory techniques. Mixture properties, phase diagrams for mixtures with polar or quadrupolar components. Surface properties.

774 Computer Modeling of Materials Spring. 3 credits. Offered alternate years. 3 lecs. S. Thompson. Computer simulation of molecular models of materials.

790 Seminar Fall, spring. 1 credit each term. D. S. Clark. General chemical engineering seminar required of all graduate students in the Field of Chemical Engineering.

792 Advanced Seminar in Thermodynamics Fall, spring. 1 credit. Not offered 1986–87. K. E. Gubbinis. A forum for talks by graduate students and faculty members on topics of current interest in thermodynamics and statistical mechanics.

890 Thesis Research Variable credit. Thesis research for the M.S. degree in chemical engineering.


Civil and Environmental Engineering General

113 Computer-aided Design In Environmental Systems (also Engr 113) Fall. 3 credits. 3 lecs. A. J. Richardson, C. A. Schoemaker. For description see Engineering Common Courses.

116 Modern Structures (also Engr 116) Spring. 3 credits. 2 lecs. R. N. White. For description see Engineering Common Courses.

241 Engineering Computation (also Engr 241) Fall, spring. 3 credits. Prerequisites: CS 100 and Mathematics 293. Corequisite: Mathematics 294. J. R. Steding, J. A. Leggett. For description see Engineering Common Courses.

304 Uncertainty Analysis in Engineering Fall. 4 credits. Prerequisite: first-year calculus. Staff. An introduction to probability theory, statistical techniques, and uncertainty analysis, with examples.
501 Civil and Environmental Engineering Design Project I Fall. 3 credits. Required for students in the M.Eng (Civil) program. School faculty and visiting engineers. Design of major civil engineering project. Planning and preliminary design in fall term; final design in January intersession (CEE 502).

502 Civil and Environmental Engineering Design Project II Spring (work done during January intersession). 3 credits. Required for students in the M.Eng (Civil) program. Prerequisite: CEE 501. School faculty and visiting engineers. A continuation of CEE 501.

503 Professional Practice in Engineering Spring. 3 credits. Required for and limited to students in the M.Eng (Civil) program. W. R. Lynn. Financial, legal, regulatory, ethical, and business aspects of engineering practice are examined in detail. Students are expected to develop their understanding of the interrelations among the physical, social, economic, and ethical constraints on engineering design.

701 Environmental Engineering Department Seminar Fall, spring. 1 credit. Staff. Presentation of topics of current interest in environmental engineering.

Remote Sensing

610 Remote Sensing Fundamentals Fall. 3 credits. Prerequisite: permission of instructor. Not offered 1986–87.
2 lecs, 1 lab. W. R. Philipson. Fundamentals of sensing earth resources with sensors of electromagnetic radiation. Coverage includes sensors, sensor and ground data acquisition, data analysis and interpretation, and project design.

2 lecs, 1 lab. W. R. Philipson. Applications of remote sensing in various environmental disciplines. Emphasis is on the use of aircraft and satellite imagery for studying surface features in engineering, planning, agriculture, and natural resource assessments.

612 Physical Environmental Evaluation Fall. 3 credits. Prerequisite: permission of instructor. Not offered 1986–87.
2 lecs, 1 lab. Staff. Physical environmental factors affecting engineering planning decisions: climate, soil and rock conditions, water sources. Evaluation methods: interpretation of meteorological, topographic, geologic, and soil maps, aerial photographs, and subsurface exploration records.

613 Image Analysis I: Landforms Fall. 3 credits. Prerequisite: permission of instructor.
2 lecs, 1 lab. Staff. Analysis and interpretation of aerial photographs for a broad spectrum of soil, rock, and drainage conditions. Specific fields of application are emphasized.

614 Image Analysis II: Physical Environments Fall. 3 credits. Prerequisite: CEE 612 or 613. Not offered 1986–87.
2 lecs, 1 lab. Staff. Study of physical environments using aerial photographs and other remote sensing methods. Conventional photography; spectral, space, and sequential photography; thermal and radar images; Arctic, tropical, arid, and humid climate regions. Project applications.

615 Digital Image Processing Fall. 3 credits. Prerequisite: facility with algebra (Mathematics 109) and statistics (Engr 206 or Agricultural Economics 310), or permission of instructor.
W. D. Philpot. An introduction to digital image-processing concepts and techniques, with emphasis on techniques used in remote-sensing applications. Topics include image acquisition, enhancement procedures, spatial and spectral feature extraction, and classification. Assignments will require the use of microcomputer-based image-processing software and graphics.

616 Digital Image Analysis Spring. 3 credits. Prerequisites: calculus (Mathematics 162), statistics (Engr 206 or Agricultural Economics 310) and computer programming (FORTRAN, Pascal, or C), or permission of instructor.
W. D. Philpot. Pattern recognition, feature extraction and classification of digital images as used in remote-sensing applications. Both spectral and spatial patterns will be considered. Assignments will require the development of computer programs and will make use of microprocessor-based image-processing software and graphics.

617 Project—Remote Sensing On demand. 1–6 credits. Staff. Students may elect to undertake a project in remote sensing and environmental evaluation. The work is supervised by a professor in this subject area.

618 Special Topics—Remote Sensing On demand. 1–6 credits. Staff. Supervised study in small groups on one or more special topics not covered in the regular courses. Special topics may be of a theoretical or applied nature.

619 Seminar in Remote Sensing Spring. 1 credit. Staff. W. R. Philipson. Presentation and discussion of current research, developments, and applications in remote sensing. Lectures by Cornell staff and invited specialists from government, industry, and other institutions.

710 Research—Remote Sensing On demand. 1–6 credits. Staff. For students who want to study one particular area in depth. The work may take the form of laboratory investigation, field study, theoretical analysis, or development of design procedures.

810 Thesis—Remote Sensing On demand. 1–12 credits. Students must register for credit with the professor at the start of each term. A thesis research topic is selected by the student with the advice of the faculty member in charge and is pursued either independently or in conjunction with others working on the same topic.

Environmental and Public Systems

321 Microeconomic Analysis (also Economics 313, section 5) Fall. 4 credits. Prerequisite: one semester of calculus. A social science elective for engineering students.
R. E. Schuler. Intermediate microeconomic analysis similar to Economics 313 but emphasizing mathematical techniques and engineering-design implications. The role of consumer choice and efficient production, analysis of monopoly and competitive markets, theories of distribution, market equilibrium and welfare economics.

322 Economic Analysis of Government (also Economics 308) Spring. 4 credits. Prerequisites: one semester of calculus, plus CEE 321 or Economics 313. A social science elective for engineering students. R. E. Schuler. Analysis of government intervention in a market economy and implications for engineering planning and design. Market imperfections, public goods, public finance, cost-benefit analysis, environmental regulation, risk management, and macroeconomic topics.

323 Engineering Economics and Management Spring. 3 credits. Primarily for juniors and seniors.
D. P. Loucks. Introduction to engineering and business economics and to methods of operations research, intended to give students a working knowledge of money management and how to make economic comparisons of alternative engineering designs or projects. Project management, inflation, taxation, depreciation, financial planning, and basic operations-research techniques of simulation and optimization are discussed.

524 Contemporary Issues in Environmental Law and Policy Fall. 1 credit. Limited to graduate students.
N. Orloff. Examination of the debate on topics such as acid rain, cleanup of hazardous-waste sites, risk assessment for carcinogens, and judicial review of the decisions of regulatory agencies.

525 Environmental Law I (also Toxicology 625) Fall. 4 credits. Limited to graduate students and seniors; other undergraduates with permission of instructor. Staff. An introduction to how the legal system handles environmental problems. Study of federal statutes such as the National Environmental Policy Act, the Clean Air Act, and the Clean Water Act; the regulations issued to implement them; and the important judicial decisions that have been handed down under each.

526 Environmental Law II (also Toxicology 626) Spring. 4 credits. Limited to graduate students and seniors; other undergraduates with permission of instructor. Recommended: CEE 525 or equivalent. Not offered 1986–87.
N. Orloff, R. Booth. Analysis of additional components of environmental law, such as those pertaining to toxic substances, hazardous wastes, and management of public lands.

527 Regulation of Toxic Substances (also Toxicology 627) Spring. 3 credits. Limited to graduate students and seniors. Recommended: CEE 525 or equivalent.
N. Orloff. Analysis of the legal doctrines and the scientific tools used by federal agencies to make decisions regarding human exposure to toxic substances. The programs of EPA, FDA, CPSC, and OSHA are examined.

528 Interactive Modeling with Microcomputer Graphics Fall. 3 credits. Staff. Engr 241 or Engr 222, and permission of instructor. D. P. Loucks. Principles of interactive modeling and its application to the design and management of environmental and water resources engineering systems. Special topics will include table and video digitizing, image processing (including editing and overlaying pictures and maps), contouring, opaque and transparent coloring, generating 2-D and 3-D colored graphs, and
529 Water and Environmental Resources Problems and Policies Fall. 3 credits. Intended primarily for graduate engineering and non-engineering students but open to qualified upperclass students. Prerequisite: permission of instructor. Lec-disc. L. B. Dworsky. Evaluation, appraisal, and prospects for problems involving water and environmental resources. Organization and public policies in the federal system.

620 Water-Resources Systems I Fall. 3 credits. Prerequisite: CEE 323 or equivalent. D. P. Loomis. Development and application of techniques for deterministic and stochastic optimization and simulation in water-resources planning. River-basin modeling, including reservoir design and operation, irrigation, flood control and operation, hydropower capacity development, flow augmentation, flood control and protection, and water-quality models.

621 Water-Resources Systems II Spring. 3 credits. Prerequisites: CEE 304 and 620 or permission of instructor. J. R. Steidinger, D. P. Loomis. Advanced topics in the development and use of optimization and simulation models for water-resources planning. Stochastic hydrologic modeling and stochastic river-basin and reservoir models. Incorporates material from CEE 622.

622 Stochastic Hydrologic Modeling On demand. 2–3 credits. Prerequisite: OR&E 370 or CEE 304. J. R. Steidinger. Develops statistical techniques used to analyze and model stochastic processes. Examination of Box-Jenkins, fractional-Brownian noise, and other single- and multiple-site stream-flow models; drought- and flood-frequency estimation; analysis of simulation output; parameter estimation and Bayesian inference.

623 Water Quality Systems Analysis Spring. 3 credits. Prerequisite: CEE 331 or permission of instructor. C. A. Shoemaker. Application of optimization and simulation methods to the design and operation of facilities for managing the quality of surface- and groundwater. Applications include location of wastewater and hazardous-waste facilities, restoration of dissolved oxygen levels in rivers, and remediation of contaminated aquifers. Optimization techniques include separable convex (linear) programming, integer programming, and nonlinear programming.

626 Modeling Managed Ecosystems Fall, on demand. 3 credits. Prerequisites: Mathematics 294, statistics, and population ecology. C. A. Shoemaker. The use of optimization and statistical estimation procedures to develop strategies for managing populations and ecosystems. Primary focus will be on pest management, poliokthermal populations, and mitigation of potential pollution from pesticides.

721 Environmental and Water Resources Systems Analysis Design Project On demand. 3 variable credits. Prerequisite: permission of instructor. May extend over two semesters. Staff. Design or feasibility study of environmental or water resources systems, supplemented and assisted by one or more faculty advisors; individual or group participation. Final report required.

722 Environmental and Water Resources Systems Analysis Research On demand. Variable credit. Prerequisite: permission of instructor. Preparation must be suitable to the investigation to be undertaken. Staff. Investigations of particular environmental or water resources systems problems.

728 Environmental and Water Resources Systems Analysis Colloquium Fall, spring. 1 credit. Staff. Lectures in various topics related to environmental or water resources systems planning and analysis.

729 Special Topics in Environmental or Water Resources Systems Analysis On demand. Variable credit. Staff. Supervised study, by individuals or small groups, of one or more specialized topics not covered in regular courses.

Fluid Mechanics and Hydrology

331 Fluid Mechanics Fall. 4 credits. Prerequisite: Engr 203 (may be taken concurrently). 3 lecs, 1 rec, evening exams. Staff. Hydrostatics, the basic equations of fluid flow, potential flow and dynamic pressure forces, viscous flow and shear forces, steady pipe flow, turbulence, dimensional analysis, open-channel flow. Elements of design in water supply systems, canals, and other hydraulic schemes.

332 Hydraulic Engineering Spring. 4 credits. Prerequisite: CEE 331. 2 lecs, 1 lab, field trips. Staff. Application of fluid-mechanical principles to problems of engineering practice and design: hydraulic machinery, water-distribution systems, open-channel design, river engineering, groundwater flow, and pollutant dispersal. Lectures supplemented by laboratory work and a design project.

430 Descriptive Hydrology On demand. 2 credits. Intended for non-engineering majors. Prerequisite: permission of instructor. W. H. Brutsaert. Introduction to hydrology as a description of the hydrologic cycle and the role of water in the natural environment. Topics include precipitation, infiltration, evaporation, groundwater, surface runoff, floods, and droughts.


635 Coastal Engineering I Spring. 3 credits. Prerequisite: CEE 331. 3 lecs. P. L. Liu. Linear wave theory, wave generation by wind, analysis of fluid forces on floating and fixed coastal structures and modification of waves and currents by these structures, coastal processes and coastal sediment motion.


637 Project—Hydraulics On demand. Variable credit. 3 lecs. Staff. Hours to be arranged. Staff. The student may elect a design problem or undertake the design and construction of special equipment in the fields of fluid mechanics, hydraulic engineering, or hydrology.

638 Hydraulics Seminar Spring. 1 credit. Open to undergraduate and graduate students. Topics of current interest in fluid mechanics, hydraulic engineering, and hydrology.

639 Special Topics in Hydraulics On demand. Variable credit. Staff. Special topics in fluid mechanics, hydraulic engineering, or hydrology.
730 Coastal Engineering II Fall. 3 credits. Prerequisite: CEE 635.
Review of linear and nonlinear theories for ocean waves, applicability of different wave theories to engineering problems. Wave-energy transmission, tsunami, behavior of submerged and floating bodies, harbor agitations, ship waves.

732 Unsteady Hydraulics Spring. 3 credits. Prerequisite: CEE 332 or permission of instructor. Offered alternate years.
J. A. Liggett.
The physical and mathematical basis for unsteady processes in hydraulic engineering, especially unsteady open-channel flow. Water hammer, unsteady sediment transport, long waves on large bodies of water, circulation. Numerical methods of solution.

734 Experimental Methods in Hydraulics On demand. 2 credits. Prerequisite: CEE 331.
G. H. Jinka.
Methods used in planning and conducting laboratory and field experiments in hydraulic and fluid mechanics. Dynamic similarity, modeling laws and applications. General operating principles and performance characteristics of measurement instruments. Specific devices for measurement of fluid properties, pressure, and flow. Data acquisition, processing, and signal analysis. Laboratory demonstrations.

735 Research in Hydraulics On demand. Variable credit.
Staff.
The student may select an area of investigation in fluid mechanics, hydraulic engineering, or hydrology. The work may be either experimental or theoretical in nature. Results should be submitted to the instructor in charge in the form of a research report.

Geotechnical Engineering

641 Introductory Soil Mechanics Spring. 3 credits.
2 lecs. 1 lab-tutorial. Staff.

640 Foundation Engineering Fall. 3 credits. Prerequisite: CEE 341.
3 lecs. optional tutorial. Staff.

641 Retaining Structures and Slopes Spring. 3 credits. Prerequisite: CEE 341.
3 lecs. optional tutorial. Staff.
Earth pressure theories. Design of rigid, flexible, braced, tie-back, slurry, and reinforced earth walls. Stability of excavation, cut, and natural slopes. Design problems stressing application of course material under field conditions of engineering practice.

642 Highway Engineering (also Ag En 491) Spring. 3 credits. Prerequisites: junior standing in engineering, fluid mechanics, and soil mechanics (may be taken concurrently).
2 lecs. 1 lab. L. H. Irwin.
For description see Ag En 491.

643 Highway Materials and Pavement Design (also Ag En 692) Fall. 4 credits. Limited to engineering seniors and graduate students. Prerequisites: CEE 341 and 642. Offered alternate years.
3 lecs. 1 lab. L. H. Irwin.
For description see Ag En 692.

647 Design Project in Geotechnical Engineering On demand. 1–6 credits. Students may elect to undertake a design project in geotechnical engineering. The work is supervised by a professor in the subject area.

648 Seminar in Geotechnical Engineering Fall. Spring.
Staff.
Presentation and discussion of topics in current research and practice in geotechnical engineering.

649 Special Topics in Geotechnical Engineering On demand. 1–6 credits.
Staff.
Supervised study of special topics not covered in the formal courses.

740 Engineering Behavior of Soils Fall. 3 credits. Prerequisite: CEE 341.
3 lecs. Staff.

741 Rock Engineering Fall. 3 credits. Prerequisite: CEE 341 or permission of instructor. Recommended: introductory geology.
2 lecs. 1 lab. Staff.

742 Graduate Soil Mechanics Laboratory Fall. 3 credits. Prerequisite: CEE 740.
3 lecs. Staff.
Laboratory measurement of soil properties, from introductory to advanced techniques. Emphasis on sampling techniques, strength, compressibility, and permeability tests. Critical evaluation of laboratory methodology. Design applications of laboratory-test results.

3 lecs. Staff.
A continuation of CEE 640, with detailed emphasis on special topics in soil-structure interaction. Typical topics include lateral and pullout loading of deep foundations, pile group behavior, foundations for offshore structures, pile-driving dynamics, foundations for special structures.]

745 Soil Dynamics Spring. 3 credits. Prerequisite: permission of instructor.
3 lecs. Staff.
Study of soil behavior under dynamic loadings. Laboratory and field techniques for determining dynamic soil properties and strength liquefaction potential. Design of embankments and retaining structures under dynamic loading conditions.

746 Embankment Dam Engineering Spring. 2 credits. Prerequisites: CEE 641 and 741, or permission of instructor.
2 lecs. Staff.
Principles of analysis and design for earth and rockfill dams. Materials, construction methods, internal and external stability, seepage and drainage, performance monitoring, abutment and foundation evaluation. Introduction to tailings dams.

Staff.

2 lecs. Staff.
Principles of analysis and design for earth and rock tunnels. Materials, construction methods, stability and support systems, deformations, and performance monitoring.

749 Research in Geotechnical Engineering On demand. 1–6 credits.
Staff.
For the student who wants to pursue a particular geotechnical topic in considerable depth.

Environmental Quality Engineering

351 Environmental Quality Engineering Spring. 3 credits.
3 lecs. L. W. Lion.

352 Water Supply Engineering Fall. 3 credits. Prerequisite: CEE 351 or permission of instructor.
3 lecs. R. I. Dick.

651 Microbiology of Water and Wastewater Fall. 2 credits. Prerequisite: one semester of college chemistry.
2 lecs. J. M. Gossett.
Microbiological phenomena pertinent to analysis of natural systems and design of engineered microbial processes in pollution control.

653 Chemistry of Water and Wastewater Fall. 3 credits. Prerequisite: one semester of college chemistry or permission of instructor.
3 lecs. -rcs. L. W. Lion.
Principles of chemistry applicable to the understanding, design, and control of water and wastewater treatment processes and to reactions in receiving waters. Topics include chemical thermodynamics, reaction kinetics, acid-base equilibria, mineral precipitation/dissolution, and electrochemistry. The focus of the course is on the mathematical description of chemical reactions relevant to engineered processes and natural systems, and the numerical or graphical solution of these problems.

654 Aquatic Chemistry Spring. 3 credits. Prerequisite: CEE 653 or Chemistry 287–288.
3 lecs. J. J. Bisogni.
Development of fundamental concepts of chemical equilibria and application to natural aquatic systems. Topics include chemical thermodynamics, acid-base reactions, buffer systems, mineral precipitation, coordination chemistry, redox reactions, and chemical equilibria computer programs. Emphasis is placed on phenomena, graphical and mathematical solutions to chemical equilibria, and their application to the prediction and management of water quality.
655 Pollutant Transport and Transformation in the Environment  Fall. 3 credits. Prerequisite: CEE 331.
J. J. Bisogni, G. H. Jrka.
An introduction to the physical transport and chemical and biochemical transformation processes that govern the fate and distribution of pollutants in the environment. Advection and diffusive mass transport, turbulent diffusion and shear-fl ow dispersion in water or atmospheric dispersion in groundwater fl ow, homogeneous and heterogeneous chemical reactions and their effects on transport phenomena, air-water-soil interface transfer processes. Emphasis on physical mechanisms, with some applications to surface water, groundwater, and atmospheric transport and quality models.

656 Environmental Quality Management  Fall; spring on demand. 3 credits (4 with approval of instructor). For upperclass or graduate students. May not be offered 1986–87.
2 lec-discs. L. D. Dowksy.
An introduction to environmental quality management; nature, cause, and control of environmental problems; interaction of physical, social, and cultural environments. Emphasis on the interdependent social, economic, developmental, and environmental issues confronting society.

658 Sludge Treatment, Utilization, and Disposal  Spring. 3 credits. Prerequisite: CEE 351 or permission of instructor.
3 lecs. R. I. Dick.
Analysis of the quantity and quality of residues produced from municipal and industrial water-supply and pollution-control facilities as a function of process design and operational variables; alternatives for reclaiming or disposing of residues with assessment of potential environmental impacts and factors influencing the magnitude of those impacts; fundamental factors influencing performance of treatment processes for altering sludge properties prior to ultimate disposal; and considerations in selection and integration of sludge-management processes to approach optimal design.

659 Environmental Quality Engineering Seminar  Spring. 1 credit. Prerequisite for all graduate students in environmental engineering, open to others with permission of instructor.
R. I. Dick.
Presentation and discussion of current research-and-design projects in environmental engineering.

752 Water Quality Laboratory  Fall. 1 credit.
Enrollment limited. Prerequisites: Previous or concurrent enrollment in CEE 651 and 653 and permission of instructor.
Staff.
Laboratory methods for analysis of pollutants in water and wastewater.

755 Environmental Engineering Processes I  Fall. 3 credits (4 with lab). Prerequisite: Previous or concurrent enrollment in CEE 651 and 653 or permission of instructor.
3 lecs, 1 lab. L. W. Lion.
Theoretical and engineering aspects of chemical and physical phenomena and processes applicable to the removal of impurities from water, wastewater, and industrial wastes and to their transformation in receiving waters. Analysis and design of treatment processes and systems. Pertinent laboratory studies.

756 Environmental Engineering Processes II  Spring. 3 credits (4 with lab). Prerequisite: CEE 651 and 755, or permission of instructor.
3 lecs. 1 lab. J. M. Gossett.
Theoretical and engineering aspects of biological phenomena and processes applicable to the removal of impurities from water, wastewater, and industrial wastes and to their transformation in receiving waters. Biokinetic analysis and design of biological treatment processes. Pertinent laboratory studies.

757 Design Project in Environmental Engineering  On demand. Variable credit. Prerequisite: CEE 351 or equivalent.
Staff.
The student chooses or is assigned a problem in the design of water or wastewater treatment, pollution-control facilities, or a laboratory project.

758 Environmental Engineering Research  On demand. Variable credit. Prerequisites will depend on the particular investigation to be undertaken.
Staff.
For the student who wants to study a problem in greater depth than is possible in formal courses. Study may be any combination of literature, laboratory, or computational research.

759 Special Topics in Environmental Engineering  On demand. Variable credit.
Hours to be arranged. Staff.
Supervised study in special topics not covered in formal courses.

851 Thesis—Environmental Engineering  Fall, spring. 1–12 credits. Students must register for credit with the professor at the start of each term. A thesis research topic is selected by the student with the advice of the faculty member in charge and is pursued either independently or in conjunction with others working on the same topic.

Transportation

361 Introduction to Transportation Engineering  Spring. 3 credits.
A. H. Meyburg.
Introduction to technological, economic, and social aspects of transportation. Emphasis on design and functioning of transportation systems and their components. Vehicle and system technology, traffic flow and control, terminal operations, supply-demand interactions, system planning, design, and management, and institutional issues.

660 Transportation Planning and Policy  Fall. 3 credits.
A. H. Meyburg.
Public-sector planning and decision making for transportation. Problems of urban transportation and their implications. A systems-analysis approach to formulation of transportation policy at the local, regional, state, and federal levels. Consideration of urban-transportation planning models.

663 Routing and Scheduling in Transportation Networks  Fall. 3 credits. Prerequisite: OR&E 320 or equivalent.
A. J. Richardson.
Design of vehicle routes and schedules in transportation systems. Network flow algorithms. Fleet utilization problems. Routing and scheduling under time constraints, multiobjective routing problems, with applications to both passenger and freight systems.

664 Transportation Systems Design  Spring. 3 credits. Prerequisite: CEE 361 or 663.
G. P. Fisher.
Advanced techniques for physical and operational design of transportation systems, including analytical modeling techniques underlying design criteria. Evaluation of alternative designs. Management and operating policies, including investment strategies. Facility location decisions, networks, and passenger and freight terminals.

668 Transportation System Operations and Management  Fall. 3 credits. Prerequisite: CEE 361 or permission of instructor.
G. P. Fisher.
Planning and management problems in urban traffic systems and their solution. Transit operations planning. Demand forecasting. Consideration and evaluation of transportation system management alternatives such as high-occupancy vehicle lanes, parking prohibitions, auto-free zones, and pricing. Traffic implications of land-use development (site planning).

761 Transportation Design Project  On demand. Variable credit.
Staff.
Design or feasibility study of transportation systems, supervised by one or more faculty advisers. Individual or group participation.

762 Transportation Research  On demand. Variable credit.
Staff.
In-depth investigation of a particular transportation planning or engineering problem mutually agreed upon between the student and one or more faculty members.

763 Transportation Colloquium  Fall, spring. 1 credit.
Lectures in various topics related to transportation planning and analysis.

764 Special Topics in Transportation  Spring. 3 credits.
A. J. Richardson.
Advanced subject matter not covered in depth in other regular courses. Topics for 1986–87 will be survey sampling methods and choice modeling for transportation demand analysis.

Structural Engineering

371 Structural Behavior  Fall. 4 credits. Prerequisite: Engr 202.
3 lecs, one 2-hour lab, evening exams. Staff.

372 Structural Analysis  Spring. 4 credits. Prerequisite: CEE 371.
3 lecs, 2-hour lab, evening exams. Staff.

373 Design of Concrete Structures  Fall. 4 credits. Prerequisites: CEE 372 or permission of instructor.
3 lecs, one 2-hour lab, evening exams. Staff.

374 Design of Steel Structures  Spring. 4 credits. Prerequisite: CEE 373 or permission of instructor.
3 lecs.

[375 Structural Behavior Laboratory  Spring. 2 credits. Prerequisite or corequisite: CEE 372.
3 lecs. A. H. Nilson.
A laboratory course on behavior of structures, utilizing small-scale models. Elastic, inelastic, and nonlinear behavior of structural components and systems. Experimental design and projects.]

376 Civil Engineering Materials  Fall. 3 credits.
2 lecs, 1 lab. K. C. Hove, F. O. Slat.
Engineering properties of concrete, steel, wood, and other structural materials. Design characteristics and significance of test results of materials used in engineering works. Extensive laboratory testing and report writing.

379 Timber Engineering  Spring. 1 credit.
Prerequisite: CEE 373.
R. N. White.
671 Random Vibration Fall. 3 credits.
Prerequisites: M&AE 326, CEE 773, and OR&IE 260, or equivalent and permission of instructor. Offered alternate years. May not be offered 1986–87.
M. D. Grigoriu.
Review of random-process theory, simulation, and first-passage time. Linear random vibration: second-order response descriptors and applications from fatigue, seismic analysis, and response to wind, wave, and other non-Gaussian load processes. Nonlinear random vibration: equivalent linearization, perturbation techniques, Fokker-Planck and Kolmogorov equations, Itô calculus, and applications from chaotic vibration, fatigue, seismic analysis, and parametrically excited systems.

672 Fundamentals of Structural Mechanics Fall. 3 credits. Prerequisite or corequisite: CEE 373. M. D. Grigoriu.
Theory of elasticity, energy principles, plate flexure, failure theories for structural design, beams on elastic foundation, finite-difference methods, introduction to finite-element method.

673 Advanced Structural Analysis Fall. 3 credits. Prerequisites: CEE 372 and computer programming. J. F. Abel.
Matrix analysis of structures, computer programming of displacement (stiffness) method, use of interactive graphical analysis programs, solution methods, errors and accuracy, special analysis procedures, virtual work in matrix analysis, and introduction to nonlinear analysis.

674 Structural Model Analysis and Experimental Methods Fall. 3 credits. 2 lecs. 1 lab. R. N. White.
Dimensional analysis and similarity. Model materials, fabrication, loading, instrumentation techniques, and use of models in design. Experimental stress analysis. Models project.

675 Concrete Materials and Construction Spring. 3 credits. Prerequisite: CEE 376 or equivalent. 2 lecs. 1 lab. K. C. Hover.
Materials science, structural engineering, and construction technology involved in the materials aspects of the use of concrete. Cement chemistry and physics, mix design, admixtures, engineering properties, testing of fresh and hardened concrete, and the effects of construction techniques on material behavior. Lab assignments.

678 Low-Cost Housing Primarily for Developing Countries (also Architecture 614) Fall. 3 credits.
2 lecs. 2 conferences. F. O. State, H. Richardson.
A broad, multidisciplinary approach covering technology, architecture, planning, sociology, economy, and cultural aspects. Students work in teams on a term project, applying their own discipline while being introduced to the problems and approaches of other disciplines. For example, engineering students investigate the technological aspects of the subject but also learn about other matters that influence technological decisions, such as cultural and economic factors.

680 Structural Engineering Seminar Fall, spring. 1 credit. Limited to qualified seniors and graduate students.
Staff.
Presentation of topics of current interest in the field of structures.

700 Engineering Fracture Mechanics Fall. 3 credits. Prerequisite: CEE 772 or permission of instructor. Offered alternate years.
2 lecs. 1 lab. A. R. Ingraffea.

711 Structural Stability: Theory and Design Spring. 3 credits.
Prerequisite: ECE 672 and 673, or permission of instructor. P. Pekota.

722 Finite-Element Analysis Spring. 3 credits. Prerequisites: ECE 672 and 673, or permission of instructor. A. R. Ingraffea.

M. D. Grigoriu.
Review of probability theory, practical measures for structural reliability, second-moment reliability indices, probability models for strength and loads, probability-based design codes, reliability of structural systems, imperfection-sensitive structures, fatigue, stochastic finite-element techniques.]

774 Prestressed Concrete Structures Spring. 3 credits. Prerequisites: CEE 373 and 376 or equivalent. Recommended: CEE 775. 3 lecs. A. H. Nilson.

775 Advanced Reinforced Concrete Fall. 3 credits. Prerequisites: CEE 373 and 376 or equivalent. 3 lecs. A. H. Nilson.
General flexural analysis, deflection analysis, columns with uniaxial and biaxial bending, beam-supported slabs, flat-plate slabs, composite steel-deck slabs, ground-supported slabs, yield-line theory, limit-state analysis, footings, retaining walls, deep beams, tall buildings, and seismic design.

776 Advanced Design of Metal Structures Fall. 3 credits. Prerequisite: ECE 373. W. McGuire.
Behavior and design, with emphasis on connections, torsion of steel members, and design to resist nonductile types of failure.

777 Advanced Behavior of Metal Structures Spring. 3 credits. Prerequisite: CEE 373. W. McGuire.
Behavior and design of tall-building systems. Plate girders. Cold-formed steel.

778 Shell Theory and Design Fall. 3 credits. Offered alternate years.
P. Gergely.
Fundamentals of practical shell theory. Differential geometry of surfaces; membrane and bending theory of shells; analysis and design of cylindrical shells, polygonal domes, and paraboloids.

779 Structural Dynamics and Earthquake Engineering Spring. 3 credits.
P. Gergely.
Modal analysis, numerical methods, and frequency-domain analysis. Introduction to earthquake-resistant design.

780 Advanced Concrete Material Science Fall. 3 credits. Prerequisites: CEE 376 or equivalent and CEE 675. T. Pekota.
Advanced study of the chemistry, physics, and microstructure of cement and concrete. Investigation of cement manufacture and chemistry, hydration reactions and thermodynamics, effect of admixtures. Study of microstructure with scanning electron microscopy, gas adsorption, and porositymetry Engineering properties and their failure mechanisms, and mechanical and viscoelastic behavior.

782 Advanced Topics in Finite-Element Analysis Fall. 3 credits. Prerequisite: CEE 772. Offered alternate years; not offered 1986–87.
J. F. Abel, A. R. Ingraffea.
Lectures and colloquia on selected advanced topics and research in progress, including dynamics, nonlinear analysis, shells, fracture mechanics, fluid dynamics, and computer graphics.

783 Civil and Environmental Engineering Materials Project On demand. 1–3 credits.
F. O. Slate.
Individual projects or reading and study assignments involving engineering materials.

784 Design Project in Structural Engineering Fall, spring. Variable credit.
Students may elect to undertake a design project in structural engineering. The work is supervised by a professor in this subject area.

785 Research in Structural Engineering On demand. Variable credit.
Hours to be arranged. Staff.
Pursuit of a branch of structural engineering beyond what is covered in regular courses. Theoretical or experimental investigation of suitable problems.

786 Special Topics in Structural Engineering On demand. Variable credit.
Hours to be arranged. Staff.
Individually supervised study on independent design or research in specialized topics not covered in regular courses.

880 Thesis—Structural Engineering Fall, spring. 1–12 credits. Students must register for credit with the professor at the start of each term. A thesis research topic is selected by the student with the advice of the faculty member in charge and is pursued either independently or in conjunction with others working on the same topic.

Computer Science

The Department of Computer Science is in both the College of Arts and Sciences and the College of Engineering.

100 Introduction to Computer Programming (also Engr 100) Fall, spring, summer. 4 credits. Students who plan to take CS 101 or 102 and also 100 must take 101 or 102 first.
2 lecs. 1 lab. K. C. Hover.
An introduction to elementary computer programming concepts. Emphasis is on techniques of problem analysis and algorithm and program development. The subject of the course is programming, not a particular programming language. The principal programming language is Pascal. The course does not presume previous programming experience. An introduction to numerical computing is included, although no college-level mathematics is presumed. Programming assignments are tested and run on interactive, stand-alone microcomputers.

101 The Computer Age Spring, summer. 3 credits. Credit is granted for both CS 100 and 101 only if 101 is taken first.
2 lecs. 1 rec. 1 evening exam.
Introduction to computer science and programming for students in nontechnical areas. Topics include the historical development of computing, the role of computers and computer-related technology; the role of computers in coordinating diversity and reducing disorder; the effect of computers on the individual; data banks and private machine creating the machine intelligence.

310 Data Structures Fall, spring, summer 4 credits. Prerequisite: CS 260 or permission of instructor.
2 lecs, 2 evening exams.
Lists, trees, graphs, arrays, and other forms of data structure and their implementation. Relationship between language and data structure, emphasizing abstract data types. Dynamic storage allocation and memory management. Detailed study of searching and sorting methods. Analysis to determine the more efficient algorithm in a given situation.

314 Introduction to Computer Systems and Organization Fall, spring, summer 4 credits. Prerequisite: CS 211 or equivalent.
2 lecs, 1 sec, 2 evening exams.
Introduction to the logical structure of digital computers. Topics include representation of information, machine assembly language, input-output channel, hierarchical storage systems, and microprogramming.

381 Introduction to Theory of Computing Fall.
4 credits. Prerequisite: CS 280 or permission of instructor.
3 lecs.
Introduction to modern theory of computing: automata theory, formal languages, and effective computability.

382 Introduction to Analysis of Algorithms
Spring. 4 credits. Prerequisites: CS 310 and CS 381 or permission of instructor.
3 lecs.
Major paradigms used in the creation and analysis of algorithms. Combinatorial algorithms, computational complexity, NP-completeness, and intractable problems.

400 The Science of Programming
Spring. 4 credits. Prerequisite: CS 280 or equivalent.
3 lecs. D. Gries.
The practical development of correct programs based on the conscious application of principles that are derived from a mathematical notion of program correctness. Besides dealing with conventional sequential programs, the course will cover implementations of abstract data types and contain an introduction to problems with concurrency. Issues in programming-language design that arise from program correctness are discussed. Programs will be written but not run on a computer.

405 Science and the Computer
Fall. 4 credits. Common Learning Course. Prerequisite: permission of instructor.
Lec, W 2:30–4:30. C. Van Loan.
How the presence of increasingly powerful computers is affecting the conduct of science in two key areas: the gathering of data and the formulation of theory. Major themes include (a) the discovery process, (b) programming languages and scientific expression, and (c) the confirmation of hypothesis through computer simulation. The nuclear winter study and the computational aspects of the Strategic Defense Initiative will be treated in depth.

411 Programming Languages and Logics
Spring. 4 credits. Prerequisites: CS 310 and permission of instructor. Enrollment limited.
2 lecs.
Introduction to major styles of programming language, with emphasis on program explanations and logics of programming. Some study of language implementations. Topics include ways of defining languages (syntax, semantics), descriptive languages (pure Lisp), imperative languages (full Lisp, Pascal), languages with assertive modes of expression (programming logics). One medium-sized project is assigned. Lisp be machine is superior for the project and for a variety of small assignments in programming and proving.

412 Introduction to Compilers and Translators Fall. 4 credits. Prerequisite: CS 314. Prerequisite or corequisite: CS 381. Offered alternate years.
3 lecs.
Overview of the internal structure of modern compilers, with emphasis on implementation techniques. Topics covered will include lexical scanning, simple parsing techniques, symbol-table manipulation, type-checking routines, and code generation for a small abstract machine. The course will entail a compiler implementation project.

414 Systems Programming and Operating Systems Fall. 3 credits. Prerequisite: CS 314 or permission of instructor.
2 lecs, 2 evening exams.
Introduction to the logical design of systems programs, with emphasis on multiprogrammed operating systems. Topics include process synchronization, deadlock, memory management, input-output methods, information sharing, protection and security, and file systems. The impact of network and distributed computing environments on operating systems is also discussed.

415 Practicum in Operating Systems Fall. 2 credits. Prerequisite: CS 310. Corequisite: CS 414. 1 lec.
The practical aspects of operating systems are studied through the design and implementation of an operating system kernel that supports multiprogramming, virtual memory, and various input-output devices. All the programming for the project is in a high-level language.

417 Interactive Computer Graphics (also Architecture 334)
Spring. 4 credits. Prerequisites: CS 314 and permission of instructor. Not offered every year.
2 lecs, 1 lab.
Introduction to the software and hardware concepts of interactive computer graphics. Topics include input methods, graphic data structures, geometric modeling, surface description methods, hidden-line/hidden-surface algorithms, image processing, color perception, and realistic image synthesis. Examples of computer-aided design applications are presented. Assignments consist of hands-on experience on storage-tube, vector-refresh, and color-raster displays. Course makes use of the Computer-Aided Design Instructional Facility.

421 Numerical Solution of Algebraic Equations
Fall. 4 credits. Prerequisites: Mathematics 222 or 294, one additional mathematics course numbered 300 or above, and knowledge of FORTRAN at the CS 222 level.
3 lecs.
Modern algorithms for systems of linear equations, systems of nonlinear equations, and multidimensional optimization. Emphasis on methods that are suitable for parallel computation.

432 Introduction to Database Systems
Spring. 3 credits. Prerequisite: CS 211 and CS 310, or permission of instructor. Recommended: CS 314.
2 lecs, 1 rec.

433 Practicum in Database Systems
Spring. 2 credits. Corequisite: CS 432.
1 lab.
Issues related to the design and implementation of database-management systems will be addressed. Students will implement a simplified relational database management system, including a file-access method and query-processing algorithms.

484 Introduction to Symbolic Computation
Spring. 4 credits. Prerequisites: CS 381, Mathematics 332 or 432, or permission of instructor. Not offered every year. Not offered 1986–87.
3 lecs.
Topics include integer and polynomial arithmetic, algebraic simplifications, manipulation of power series, integration of rational functions, and an introduction to a symbolic computation package such as MACSYMA.

486 Applied Logic (also Mathematics 486)
Spring. 4 credits. Prerequisites: Mathematics 222 or 294, CS 100, and some additional course in mathematics or theoretical computer science.
2 lecs, 1 lab to be arranged.
Propositional and predicate logic, compactness and completeness by tableaux and natural deduction. Equational logic. Herbrand Universes, the resolution method, and unification. Rewrite rules and equational logic. Knuth-Bendix method and the congruence-closure algorithm and λ-calculus reduction strategies. Restrictions on resolution and their completeness. Introduction to automatic theorem proving and selected topics in computer science. Topics in Prolog, Lisp, or ML on microcomputers or, possibly, exposure to a larger system such as Nuprl. Input resolution and Prolog. Applications to expert systems and program verification.

490 Independent Reading and Research Fall, spring. 1-4 credits.
Independent reading and research for undergraduates.

600 Computer Science and Programming Fall. 1 credit. Prerequisite: graduate standing in computer science or permission of instructor. 
1lec. Introduction to practical, modern ideas in programming methodology. Covers style and organization of programs; basic techniques for proving proofs of correctness of programs, and the use of a "calculus" for the derivation of programs.

611 Advanced Programming Languages Fall. 4 credits. Prerequisite: CS 310 or permission of instructor. 
3lec. Introduction to techniques for formal specification of programming languages and data types, including term-rewriting systems and Scott's denotational techniques; use of formal semantics in comparing and classifying languages; other advanced concepts, including logic programming, functional programming, and data-flow languages.

612 Translator Writing Spring. 4 credits. Prerequisites: CS 310 and 381, or permission of instructor. 
3lec. Discussion of the models and techniques used in the design and implementation of compilers. Topics include lexical analysis in translators, compilation of arithmetic expressions and simple statements, specifications of syntax, algorithms for syntactic analysis, code generation and optimization techniques, bootstrapping methods, and translator writing systems.

613 Concurrent Programming and Operating Systems Principles Spring. 4 credits. Prerequisites: CS 414 and 600, or permission of instructor. 
3lec. Covers advanced techniques and models of concurrent systems. Synchronization of concurrent processes; parallel programming languages; deadlock; verification.

614 Advanced Operating Systems Spring. 4 credits. Prerequisite: CS 414 or permission of instructor. 
2lec. An advanced course in operating systems, emphasizing contemporary research in distributed systems. Topics may include processes and file systems, virtual memory and segmentation, addressing, scheduling, performance, protection, communication mechanisms, and fault-tolerant systems.

615 Machine Organization Spring. 4 credits. Prerequisite: CS 314 or permission of instructor. Not offered 1986–87.
3lec. 

616 VLSI Algorithms Spring. 4 credits. Prerequisite: permission of instructor. 
2lec. This course focuses on the area-time performance of VLSI computing systems. After a review of technology, a model of computation for VLSI is defined. General area-time lower-bound techniques are presented and applied to specific problems such as integer arithmetic, matrix operations, signal processing, sorting, and graph problems. Design of parallel algorithms and architectures is then discussed for the same class of problems. Selected topics on computer-aided design for VLSI, such as layout and testing, will also be covered.

621 Matrix Computations Fall. 4 credits. Prerequisites: CS 421 and Mathematics 411 and 431, or permission of instructor. 

622 Numerical Optimization and Nonlinear Algebraic Equations Spring. 4 credits. 
3lec. Modern algorithms for the numerical solution of multidimensional optimization problems and simultaneous nonlinear algebraic equations. Emphasis is on efficient, stable, and reliable numerical techniques with strong global convergence properties: quasi-Newton methods, modified Newton algorithms, and trust-region procedures. Special topics may include large-scale optimization, quadradic programming, and numerical approximation.

623 Database Systems Fall. 4 credits. Prerequisites: CS 310 and 432, or permission of instructor. 
2lec. Discussion of data models and the implementation of database systems, with an emphasis on current areas of research. Topics include the relational model, data-dependency theory, semantic modeling, query optimization, transaction management, and advanced issues in distributed databases.

635 Automatic Text Processing and Information Retrieval Spring. 4 credits. Prerequisite: CS 310 or permission of instructor. 
2lec. Modern methods for natural language text processing. Topics include text analysis, storage and retrieval, automatic spelling aids, text compression and encryption, language understanding systems, automatic abstracting, and text generation and translation.

643 Design and Analysis of Computer Networks Fall. 4 credits. Prerequisite: CS 414 or permission of instructor. Not offered every year.
2lec. A course in computer networks and layered protocols. The following topics are presented: network topology design, data transmission within the physical layer: data-link sliding-window protocols: network layer in point-to-point long-haul networks, satellite and packet radio networks and local networks; transport and session layer protocols: internetworking. Selected topics from the presentation and application layers will also be discussed.

652 Sparse Matrix Theory: Combinatorial Algorithms and Numerical Computation Spring. 4 credits. Prerequisites: CS 621 and 681, or permission of instructor. Not offered every year.
2lec. Efficient methods for solving large, sparse systems of linear algebraic equations. Emphasis on the combinatorial aspects of sparse problems; tools include efficient graph algorithms and data structures as well as more conventional numerical linear algebra. Focus on direct as opposed to iterative methods. Much of the course is concerned with ordering strategies for Gaussian elimination and the resulting fill. Also discussed are sparse least-squares problems and large-scale programming.

655 Mathematical Foundations of Computer Modeling and Simulation (also Mathematics 655) Fall. 4 credits. Prerequisites: Mathematics 431 and 432, or the equivalent in both content and level of mathematical sophistication, or permission of the instructor. 
3lec. This course will have two parts, one purely mathematical and the other emphasizing applications. The first part is intended to introduce students to theoretical concepts that are relevant to the study of robotics, solid modeling, and simulation. These tools will be drawn from the areas of real and complex algebraic geometry, topology, differential geometry, and difference equations. The second part of the course will provide applications that illustrate uses of the mathematics and point the way to needed further developments.

661 Robotics Fall. 4 credits. Prerequisites: CS 611 and 681, or permission of instructor. Not offered every year.
3lec. Topics include homogeneous coordinates, manipulator movement, geometrical modeling, motion planning, compliance, computer vision, language issues, task planning, and pertinent mathematics.

662 Robotics Laboratory Fall. 1 credit. Prerequisite: graduate standing or permission of instructor. 
1lab. Introduction to the use of equipment and techniques in a modern robotics laboratory. Includes VAL programming, force sensing, compliant motion, and mechanical assembly.

671 Introduction to Automated Reasoning Fall. 4 credits. Prerequisites: CS 611 and 681 and Mathematics 581.
3lec. Methods to automate reasoning in mathematics, including decision procedures, theorem provers, and formal proof tactics. Various implemented systems such as Edinburgh LCF, Cornell's Nuprl, and the Boyer and Moore theorem prover may be studied.

681 Analysis of Algorithms Fall. 4 credits. Prerequisite: CS 381 or permission of instructor. 
3lec. Topics include homogeneous coordinates, manipulator movement, geometrical modeling, motion planning, compliance, computer vision, language issues, task planning, and pertinent mathematics.

682 Theory of Computing Spring. 4 credits. Prerequisite: CS 381 or permission of instructor. 
3lec. Advanced treatment of theory of computation, computational-complexity theory, and other topics in computing theory.

709 Computer Science Graduate Seminar Fall, spring. 1 credit. S-U grades only For staff, visitors, and graduate students interested in computer science. A weekly meeting for the discussion and study of important topics in the field.

711 Topics in Programming Languages and Systems Spring. 4 credits. Prerequisites: CS 381 and 611 or permission of instructor. Not offered every year.
2lec. Topics are chosen at instructor's discretion.

712 Topics in Programming Languages and Systems Spring. 4 credits. Prerequisite: CS 612 or permission of instructor. Not offered every year.
2lec. Topics are chosen at instructor's discretion.
715 Seminar in Operating Systems  Fall, spring. 4 credits. Prerequisite: CS 613 or permission of instructor. Not offered every year.
Discussion of contemporary issues in operating systems.

714 Distributed Computing  Spring, 4 credits. Prerequisites: CS 448 and an advanced systems course such as CS 613, 614, 632, or 643. Not offered every year.
2 lecs. Principles of distributed computing and their application to fundamental problems such as deadlock detection. Considerable time will be devoted to modeling distributed computations, the theory of concurrency control, security and protection, and issues in fault tolerance (including consensus problems). Other topics may be optimal resource placement, cache management, the specification of distributed programs, and randomized protocols.

719 Seminar in Programming  Fall, spring. 4 credits. Prerequisite: permission of instructor.
Topics in programming languages, possibly including type theory, constructive logic, decision procedures, heuristic methods, extraction of code from proofs, and the design of proof-development systems.

721 Topics in Numerical Analysis  Fall. 4 credits. Prerequisite: CS 621 or 622 or permission of instructor. Not offered every year.
2 lecs. Topics are chosen at instructor's discretion.

722 Topics in Numerical Analysis  Spring. 4 credits. Not offered every year.
2 lecs. Topics are chosen at instructor's discretion.

729 Seminar in Numerical Analysis  Fall, spring. 1–4 credits. Prerequisite: permission of instructor. S-U grades only.

733 Topics in Information Processing  Not offered 1986–87.
2 lecs. Topics are chosen at instructor's discretion.

734 Seminar in File Processing  Fall. Credit to be arranged. Prerequisite: CS 733 or permission of instructor. Not offered 1986–87.

739 Seminar in Text Processing and Information Retrieval  Fall, spring. Credit to be arranged. Prerequisite: CS 635 or permission of instructor. S-U grades only.

749 Seminar in Systems Modeling and Analysis  Fall, spring. 4 credits. Prerequisite: permission of instructor. Not offered every year.
Discussion of advanced topics in modeling and analysis of computer systems and networks, with emphasis on performance.

781 Topics in Analysis of Algorithms and Theory of Computing  Fall. 4 credits. Prerequisites: CS 681 and 682, or permission of instructor. S-U grades only. Not offered every year.
2 lecs. Topics are chosen at instructor's discretion.

782 Topics in Analysis of Algorithms and Theory of Computing  Spring. 4 credits. Prerequisites: CS 681 and 682, or permission of instructor. S-U grades only. Not offered every year.
2 lecs. Topics are chosen at instructor's discretion.

789 Seminar in Theory of Algorithms and Computing  Fall, spring. 2–4 credits. Prerequisite: permission of instructor. S-U grades only.

790 Special Investigations in Computer Science  Fall, spring. Prerequisite: permission of a computer science adviser. Independent research.

890 Special Investigations in Computer Science  Fall, spring. Prerequisite: permission of a computer science adviser. S-U grades only.
Master's degree research.

990 Special Investigations in Computer Science  Fall, spring. Prerequisite: permission of a computer science adviser. S-U grades only.
Doctoral research.

Electrical Engineering

Required Courses

210 Introduction to Electrical Systems (also Engr 210)  Fall, spring. 3 credits. Prerequisites or corequisites: Mathematics 293 and Physics 213.
3 lecs and optional tutorial sections.
For description see Engineering Common Courses.

230 Introduction to Digital Systems  Fall, spring. 3 credits.
2 lecs, 5 lab experiments.
Introduction to basic analysis, design techniques, and methodology of digital systems. Boolean algebra; integrated circuit components used in digital-system implementation; codes and number systems; logic design of combinational circuits; logic design of sequential circuits; register transfer systems; and Von Neumann machines. A simple processor is designed in class.

301 Electrical Signals and Systems I  Fall. 4 credits. Prerequisites: a grade of at least C + in Engr 210 and C in Mathematics 293 and 294.
3 lecs, 1 rec-computing session.
Linear time-invariant systems as models for active and passive networks; nodal analysis, convolution, unilateral Laplace transforms, relationships between steady-state system response and dynamical behavior; introduction to state variable analysis.

302 Electrical Signals and Systems II  Spring. 4 credits. Prerequisite: EE 301.
3 lecs, 1 rec-computing session.
Continuous- and discrete-time signals and systems; Fourier series and transforms; bilateral Laplace and z transforms; applications of complex function theory and contour integration to system analysis; FFTs and DFTs; applications to modulation, filtering, and sampling.

303–304 Electromagnetic Waves and Fields I and II 303, fall; 304, spring. 4 credits each term.
Prerequisites: grades of C or better in Physics 213 and 214, and Mathematics 294.
3 lecs, 1 rec-computing session.
Foundation and applications of electromagnetic theory, with emphasis on wave propagation, radiation, and the effects of the medium on wave transmission. Maxwell's equations, boundary conditions, electrostatics, Poynting theorem, electromagnetic basis of material properties and of circuits, plane waves in isotropic media, impedance concept and reflection, transmission lines, simple waveguides, resonant cavities, radiation and antenna systems, wave propagation in inhomogeneous and anisotropic media, and plasma and magnetic field effects. At the level of Fields and Waves in Communication Electronics, by Ramo, Whinnery, and Van Duher, second edition.

305 Fundamentals of Quantum and Solid-State Electronics  Spring. 4 credits. Prerequisites: Physics 214, Mathematics 294, and EE 303.
3 lecs, 1 rec-computing session.
Introduction to quantum mechanics and solid-state physics necessary for understanding lasers and modern solid-state electronic devices. Quantum mechanics is presented in terms of wave functions, operators, and solutions of Schroedinger's equation. Problems include the formalism and methods of quantum mechanics, the hydrogen atom, the structure of simple solids, energy bands, Fermi-Dirac statistics, and the basic physics of semiconductors. Applications studied include a simple metal, thermionic emission, and the p-n junction.

310 Probability and Random Signals  Spring. 4 credits. Prerequisite: Mathematics 294.
3 lecs, 1 rec-computing session.
Introduction to modeling random phenomena and signals and applications of these models. Topics include concepts of probability, conditional probability, independence, random variables, expectation and random processes. Applicable to problems of inference, estimation, and linear system response in communications, computers, control, and pattern classification.

315 Electrical Laboratory I  Fall. 4 credits.
Prerequisite: a grade of at least C + in Engr 210.
Corequisite: EE 301.
2 lecs, 2 labs.
Basic electrical and electronic instrumentation and measurements involving circuits and fields of both active and passive elements; an experimental introduction to solid-state theory and devices. Introduction of the personal computer as a laboratory aid.

316 Electrical Laboratory II  Fall. 4 credits.
Prerequisites: EE 303 and 315.
2 lecs, 2 labs.
Laboratory studies of solid-state phenomena and devices; experiments illustrating the use of the personal computer in electrical engineering; laboratory studies of high-frequency phenomena and devices, and introduction to AC and DC machinery.

Computer Engineering

230 Introduction to Digital Systems  Fall, spring. 3 credits.
For description see Required Courses.

424 Computer Methods in Electrical Engineering  Fall. 4 credits. Prerequisite: EE 301.
3 lecs. C. Pottle.
Numerical techniques every electrical engineer should know, presented in the context of circuit simulation. Solution of linear and nonlinear algebraic equations; integration; solution of ordinary differential equations; introduction to sparse-matrix methods; alternative forms of circuit-equation formulation. Starting from a program to simulate simple, linear passive, steady-state circuits, the instructor will add, and the students improve on, procedures that will finally result in a nonlinear transient integrated-circuit simulator that involves most of the techniques discussed in the lectures.

475 Computer Structures  Fall. 4 credits.
Prerequisite: EE 230.
3 lecs, 1 lab. N. M. Vrana.
Organization and design of digital computers. Hardwire and microprogrammed control sequences, arithmetic unit hardware, and I/O systems. Interrupt hardware, and memory organization. Each four-to-six-person laboratory group will design and construct a small digital computer. User-programmable logic devices will be employed in the laboratory for circuit implementation.

476 Microprocessor Systems  Spring. 4 credits.
Prerequisite: EE 475.
3 lecs, 1 lab. N. M. Vrana.
System design using microprocessors. Hardware and software techniques employed for logic design, interfacing, instrumentation, and control. The use of development systems. User-programmable logic devices will be employed in the laboratory for interfacing the microcomputer to hardware.
539 (639) VLSI Digital-System Design Fall and spring. 6 credits (must be taken both semesters). Prerequisite: EE 476 or equivalent.
Fall: 3 lecs, 1 computing sec; spring: 1 lec, 1 lab. Custom VLSI design as seen by a system designer. Switches as logic devices, MOS logic design, two-phase clocking, stick diagrams, cell layout, regular control structures, simulation, performance analysis, and timing model, system design for performance, design for testing, semicon ductor design, systolic arrays, CAD design tools. A chip design project and design report are required for fall semester. CAD tools are used extensively. Chips are tested for functionality and performance, and the design report is reviewed during the spring semester.

541 Computer Processes Organization and Memory Hierarchy Fall. 4 credits. Prerequisite: EE 476 or permission of instructor. F. T. Luk.
Design and evaluation of processor and memory architectures are examined in the light of actual implementations of both large-scale and small-scale (microprocessor) systems. Topics include microprogramming, parallel and pipelined architectures, page, page memories, cache and virtual memories, I/O processors, vector and array processors, and protection mechanisms.

542 Parallel Processing Spring. 3 credits. Prerequisite: EE 541 or permission of instructor. 3 lecs. A. P. Reeves.
Computer architecture for parallel processors that are designed to provide a high computation rate for large scientific problems; primary emphasis on image processing and highly parallel VLSI-based systems. Other applications considered include signal processing and the solution of PDEs. Performance, processor interconnections, algorithms, programming techniques, and fault tolerance will be discussed. Architecture types to be considered include binary-array processors, pipeline processors, inner-product computers, systolic arrays, and MIMD systems.

544 VLSI Architectures and Algorithms Spring. 3 credits. Prerequisite: EE 541 or permission of instructor. 3 lecs. F. T. Luk.
Since the advent of VLSI, the cost of processing logic is no longer a fundamental constraint on the design of computer architectures. Problems that once were computationally intractable can now be solved on arrays of thousands or even tens of thousands of processors. This course addresses the important question: What are the optimal VLSI structures and algorithms for solving these problems? The architectures we will examine include systolic arrays, mesh-connected processors, and data-flow computers; special attention will be given to problems that arise in real-time signal processing.

545 Computer Networks and Telecommunications I Fall. 3 credits. Prerequisite: EE 476 or permission of instructor. 3 lecs. H. C. Wong.
Methods and approaches in the design, analysis, and implementation of local area networks and public data networks; circuit switching, packet switching, carrier-sense multiple access with collision detection, token passing; ethernet, busses, and rings; roles and functions of protocols; layering and ISO models; CCITT recommendations and SNA.

546 Computer Networks and Telecommunications II Spring. 3 credits. Prerequisite: EE 545 or permission of the instructor. 3 lecs. H. C. Wong.
Analysis and implementation of time- and space-division switching; architectural alternatives for telecommunications systems; blocking and nonblocking networks; voice- and data-switching requirements; integrated voice-data-approaches, evolution toward the integrated services digital network (ISDN).

547 Computer Vision Fall. 3 credits. Prerequisite: EE 302 and EE 475 and permission of instructor. 3 lecs. A. P. Reeves.
Computer acquisition and analysis of image data, with emphasis on techniques for robot vision. Computer vision is the construction of explicit meaningful descriptions of physical objects from images. This course will concentrate on descriptions of objects at three levels of abstraction: segmented images (images organized into subimages that are likely to correspond to interesting objects), geometric structures (quantitative models of image and world structures), and relational structures (complex symbolic descriptions of images and world structures). The programming of several computer vision algorithms will be required.

548 Image Processing Spring. 3 credits. For description see Circuits, Systems, and Signal Processing.

563 Communication Networks Fall. 4 credits. For description see Communication and Information Systems.

564 VLSI and Communication Systems Fall. 3 credits. Prerequisite: EE 541 or permission of instructor. 3 lecs. A. P. Reeves.
Integrated services digital network (ISDN).

571 Theory of Linear Systems Fall. 4 credits. Prerequisite: EE 302 or permission of instructor. 3 lecs.
State-space and input-output linear systems. Transition matrix, matrix exponential functions, the Cayley-Hamilton theorem, and the Jordan form. Controllability, observability, stability, realizability. At the level of Linear Systems, by T. Kailath. (A good background in linear algebra and differential equations is desirable.)

572 Theory of Nonlinear Systems Spring. 4 credits. Prerequisites: EE 521 or a solid background in linear algebra strongly recommended but not required.
A fairly rigorous introduction to nonlinear systems, including nonlinear differential equations (existence and uniqueness theorems); flows; stability of equilibrium and periodic orbits; Lyapunov functions; the Circle Criterion and Popov's Criterion; the Poincaré-Bendixson Theorem.

574 Theory of Stochastic Processes Spring. 3 credits. Prerequisites: EE 302, 423, and 475, or permission of instructor. 3 lecs.
Introduction to information and perception, computer representation of images, image enhancement and restoration, image reconstruction from projections, scene understanding, image analysis, and computer architecture for image processing. The programming of several computer-vision algorithms will be required.

Communication and Information Systems

310 Probability and Random Signals Spring. 4 credits. For description see Required Courses.

467 (567) Introduction to Communication Systems Fall. 4 credits. Prerequisites: EE 302 and 310 or equivalents.
2 lecs, 1 rec.
Introduction to communication theory, with emphasis on signal representation using Fourier and Hilbert transform techniques. Varieties of amplitude modulation (AM, DSBB, SSB, VSB, OM) and their demodulators. Frequency modulation and demodulation. Sampling theorem and aliasing. Models of noise: stationary random processes, narrow-band Gaussian random processes. Demodulation of AM and FM in the presence of noise. Applications to commercial broadcasting and data transmission.

545 Computer Networks and Telecommunications I Fall. 3 credits. For description see Computer Engineering.

546 Computer Networks and Telecommunications II Spring. 3 credits. For description see Computer Engineering.

561 Error-Control Codes Spring. 3 credits. Prerequisite: EE 302 or EE 521 or equivalent. A strong familiarity with linear algebra is assumed.
3 lecs.
An introduction to the theory of error-control codes: linear block codes, convolutional and other trellis codes. Hamming codes, minimum distance, standard array, minimum distance decoding, cyclic codes. New codes from old and concatenated codes. The Viterbi algorithm and sphere packing and the Singleton bound for error-correcting codes. Algebra, groups, rings, and fields with special emphasis on Galois or finite field theory. The construction and decoding of Bose-Ray Chaudhuri-Hocquenghem (BCH) and Reed-Solomon (RS) codes. Algebraic description of binary convolutional codes. Decoding algorithms and construction of Euclidean distance trellis codes.

562 Fundamental Information Theory Spring. 3 credits. Prerequisite: EE 310 or equivalent. 3 lecs.
Fundamental results of information theory with application to storage, compression, and transmission.
of data. Entropy and other information measures. Block and variable-length codes. Channel capacity and rate-distortion functions. Coding theorems and converses for classical and multiterminal configurations. Gaussian sources and channels.

563 Communication Networks Fall. 4 credits. Prerequisite: EE 310 or permission of instructor. 3 lecs. Classical line-switched communication networks: point-process models for offered traffic; blocking and queueing analyses. Stability, throughput and delay of distributed algorithms for packet-switched transmission of data over local and wide-area communication networks: TDMA, FDMA, ALOHA, slotted ALOHA, Ethernet, reservation, tree, and interval-searched contention resolution protocols. Priority and privacy issues, including authentication and public-key cryptography. Examples drawn from packet radio, cellular mobile radio, and satellite communications.

564 Decision Making and Estimation Spring. 4 credits. Prerequisite: EE 310 or equivalent. An introduction to those methods of making rational decisions and inferences and of forming estimates that are central to problems of communications, detection, and pattern classification. Topics to be covered include utility theory; Bayes, minimax, and Neyman-Pearson decision theories; Bayes and maximum-likelihood point estimation; Cramer-Rao bound, efficient, and consistent estimation. Special topics (such as spectral and density estimation, robustness) as time permits.

568 Communication Systems II Spring. 4 credits. Prerequisite: EE 467 or equivalent. An introduction to digital communications. Discrete representations for signals: pulse-code modulation (PCM), delta modulation (DM), differential pulse-code modulation (DPCM), companding and Huffman coding. Digital modulator/demodulators (MODEMs): signal sets such as phase shift keying (PSK), frequency shift keying (FSK), and phase-shift PSK-postion (MAP) and maximum-likelihood (ML) receivers, probability of error, symbol-timing and carrier-tracking loops, and intersymbol interference (ISI). Coded systems; convolutional codes, Viterbi and sequential decoding. Multiplexing: time division (TDM), frequency division (FDM), code division (CDM). Spread spectrum.

664 Foundations of Inference and Decision Making Spring. 3 credits. Prerequisite: A course in probability and some statistics, or permission of instructor. 3 lecs. An examination of methods for characterizing uncertainty and chance phenomena and for transforming information into decisions and optimal systems. Discussion of the foundations of inference includes topics drawn from comparative probability, interval-valued probability, quantitative probability, relative frequency interpretations, computational complexity, randomness, classical probability and invariance, induction, and subjective probability.

668–669 Random Processes in Electrical Systems 668, fall; 669, spring. 3 credits each term. Advanced topics in the general area of randomness and uncertainty and their relevance to the analysis and design of electrical systems.

Power and Control Systems

451–452 Electric Energy Systems I and II 451, fall; 452, spring. 4 credits each term. Prerequisite for 451: EE 302 and EE 316 or permission of instructor. 3 lecs-rcs, 1 lab-computing session. Engineering mathematics and design of electric-power systems based on load-flow, stability, control, and dispatch. The level of Elements of Power System Analysis (4th ed.), by Stevenson.

471 (571) Feedback Control Systems Fall. 3 credits (4 with lab). Prerequisite: 302 or permission of instructor. 3 lecs, 1 lab. R. J. Thomas. Analysis techniques, performance specifications, and analog-feedback-compensation methods for continuous-time systems. Design techniques include root-locus methods, frequency-response methods. Laplace transforms and transfer functions are the major mathematical tools. Laboratory work provides experience with measurement of system frequency-response, transient-response, and transfer function; design and compensation of linear, low-order PID systems; and computer-aided design techniques. Laboratory emphasis is on correlation of theoretical and experimental results.

555 Advanced Power Systems Analysis I Fall. 3 credits. Prerequisites: EE 302 and concurrent registration in 451, or permission of instructor. Not offered 1986–87. Analysis of power-system components. These components include rotating machines and systems for excitation control, automatic voltage regulation, boiler-turbine control, and speed regulation, as well as ancillary three-phase power systems. Emphasis on development of mathematical models from first principles; development of algorithms for the formation of applicable network matrices.


564 Decision Making and Estimation Fall. 4 credits. For description see Communication and Information Systems.

572 Digital Control Systems Spring. 4 credits. Prerequisite: EE 471 or permission of instructor. 3 lecs; R. J. Thomas. Analysis and design of feedback control systems using digital devices to implement compensation. Z-transforms, digital equivalents, root-locus, PID, deadbeat, and state-variable techniques will be used. Quantization and sample-rate effects in sampled-data control systems will be considered. Assignments will consist of computer-aided controller design and digitally simulated evaluation.

573 Estimation and Control in Discrete Linear Systems Fall. 4 credits. Prerequisites: EE 302 and 310, or permission of instructor. 3 lecs. Optimal control filtering, and prediction for discrete-time linear systems. Approximation on discrete point sets. The principle of optimality. Kalman filtering. Stochastic optimal control.

574 Optimal Control and Estimation for Continuous Systems Spring. 4 credits. Prerequisite: EE 573 or permission of instructor. 3 lecs. Control system design through parameter optimization, with and without constraints. The minimum principle; linear regulations, minimum-time and minimum-fuel problems. Computational techniques; properties of Lyapunov and Riccati equations.

664 Foundations of Inference and Decision Making Spring. 3 credits. For description see “Communication and Information Systems”.

Solid-State Electronics

306 Fundamentals of Quantum and Solid-State Electronics Spring. 4 credits. For description see Required Courses.

431–432 Analysis and Design of Integrated Circuits 431, fall; 432, spring. 4 credits each term. Prerequisites: EE 307 and 316. Concurrent registration in EE 435 is encouraged.

545–546 Microwave Electronics I and II 435, fall; 436, spring. 4 credits each term. 3 credits without laboratory and with permission of instructor. Prerequisites: EE 310 and 316, or equivalent. 3 lecs, 1 lab. J. P. Kruisius. Semiconductor electronics from point-contact transistor to megabit dynamic random-access memories and beyond. Fall term: electronic characteristics of semiconductors, electronic devices, and circuit design. Spring term: electronic design of VLSI circuits and systems. At the level of “Analysis and Design of Digital Integrated Circuits,” by Gray and Meyer.

545–546 Solid-State Microelectronic Devices and Circuits I Fall. 4 credits. For description see Fields, Waves, and Antennas.

545–546 Solid-State Microwave Devices and Circuits II Spring. 4 credits. For description see Fields, Waves, and Antennas.

535 Semiconductor Physics Fall. 4 credits. Prerequisites: EE 304 and 407, or permission of instructor. 3 lecs. Foundations of semiconductor physics for the description of carrier transport and optical characteristics of semiconductor materials and structures. Crystal structure and symmetry, energy band structures, statistics, effective mass theorem, classical transport, scattering, high field transport, quantum transport, optical absorption and reflection, photodconducitivity, light generation, deep levels, and surface and interface phenomena. On or above the level of Semiconductor Physics, by K. Seeger.

536 VLSI Technology Spring. 4 credits. Prerequisite: EE 435 or permission of instructor. 3 lecs, 1 lab. S. S. Wong. Processing technology for silicon MOS and bipolar integrated circuits, and circuit design, with emphasis on the analysis of and design of integrated circuits. Laboratory projects emphasize applications of integrated circuits and design concepts discussed in the lectures. Models for active devices and noise sources are developed and applied to the design, analysis, and application of common analog and digital integrated circuits such as high-frequency amplifiers, operational amplifiers; D/A and A/D converters; ECL, TTL, and CMOS logic; and semiconductor memory. At the level of Analysis and Design of Digital Integrated Circuits, by Hodges and Jackson, and Analysis and Design of Analogue Integrated Circuits, by Gray and Meyer.
opportunity to work with a variety of lasers and communication, and research. Laboratory presents an optical cavities, interaction of radiation with matter, topics. On the level of optics, and optical applications to communication and The physical principles of fiber optics, integrated waveguides, and high-speed optical compound semiconductor technologies. Concepts developed in EE 535 and 536 are applied to current state-of-the-art topics. On the level of IEEE Transactions on Electronic Devices, Journal of Applied Physics, and current conference proceedings.

**Quantum and Opto-Electronics**

**306 Fundamentals of Quantum and Solid-State Electronics** Spring. 4 credits. For description see Required Courses.

**407 Quantum Mechanics and Applications** Fall. 4 credits. Prerequisite: EE 306. 3 lecs., 1 rec-computing session. Fundamentals of quantum mechanics: harmonic oscillator, theory of angular momentum and atomic structure, time-independent and time-dependent perturbation theory, and interaction of radiation with matter. Applications to spectroscopy, solid-state physics, and lasers.

**430 Lasers and Optical Electronics** Fall. 3 or 4 credits. Prerequisite: EE 306. 3 lecs., 1 lab. An introduction to the operation of stimulated-emission devices such as lasers and devices based on linear and nonlinear optics. Material covered includes diffraction-limited optics, propagation of laser beams, optical cavities, interaction of radiation with matter, physics of laser operation, laser design, and application of coherent radiation to nonlinear optics, communication, and research. Laboratory presents an opportunity to work with a variety of lasers and processes discussed in lecture.

**437 Fiber and Integrated Optics** Spring. 3 or 4 credits. Prerequisite: EE 306. EE 304 and 430 or equivalents are strongly recommended. 3 lecs. 1 lab—computing session. The physical principles of fiber optics, integrated optics, and optical applications to communication and sensing. Topics include propagation through lossy waveguides, dispersion and bandwidth limitations, optical sources based on semiconductors, detectors and noise, modulation techniques, nonlinear effects in fibers, and optical sensors.

**531 Quantum Electronics I** Fall. 4 credits. Prerequisites: EE 306 and 407 or Physics 443. 3 lecs., 1 lab. A detailed treatment of the physical principles underlying lasers, related fields, and applications. Topics include the interaction of radiation and matter, including emission, absorption, scattering, and macroscopic material properties; theory of the laser, including methods of achieving population inversions, output power of amplifiers and oscillators, dispersive effects, and laser oscillation spectrum.

**532 Quantum Electronics II** Spring. 4 credits. Prerequisites: EE 531 or permission of instructor. 3 lecs., 1 lab—computing session. A continuation of EE 531. Topics include spectroscopy of atoms, molecules, and ions in crystals as examples of laser media; density matrix; nonlinear optics and optical processes; theory of coherence; integrated optics and optical communication.

**535 Semiconductor Physics** Fall. 4 credits. For description see Solid-State Electronics.

**Plasmas and Large-Scale Fluids**

**481 Experimental Plasma Physics and Gas Discharges** Fall. 4 credits. Prerequisites: EE 304 or A&E 356 or equivalent. Fulfills electrical engineering laboratory requirement and constitutes an M.E. (Electrical) course pair with EE 480 or 484. 2 lecs., 1 lab, C. B. Wharton. Theory and practice of generation, control, and diagnostics of plasmas and intense particle beams. Coordinated lectures and nine experiments and a field trip. Plasma breakdown, collisions, diffusion, sheaths, Cockcroft-Walton, and diode operation. Discussion of macroscopic and microscopic measurements. Reflex discharge, vacuum technology, plasma probing. Electromagnetic and space-charge wave propagation, microwave and optical radiation. Intense particle beams. Methods for data collection and analysis.

**484 Introduction to Controlled Fusion: Principles and Technology (also M&A.E. 559 and NS&E 484)** Spring. 3 credits. Prerequisites: EE 301 and 303, or permission of instructor. Intended for seniors and graduate students. 3 lecs., D. A. Hammer. For description see NS&E 484.

**487 Antennas and Propagation** Fall. 3 credits. For description see Fields, Waves, and Antennas.

**581 Introduction to Plasma Physics (also A&E 606)** Fall. 4 credits. First-year graduate-level course; open also to exceptional fourth-year students with permission of instructor. Prerequisites: EE 303 and 304 or equivalent. 3 lecs. Plasma: motion of charged particles in fields; collisions, Coulomb scattering, transport coefficients, ambipolar diffusion, plasma oscillations and waves; hydromagnetic equations; hydromagnetic stability and microscopic instabilities; test particle in a plasma; elementary applications. At the level of Plasma Physics for Nuclear Fusion, by Miyamoto.

**582 Advanced Plasma Physics (also A&E 607)** Spring. 4 credits. Prerequisite: EE 581. 3 lecs. For description see A&E 607.

**583 Electrodynamics** Fall. 4 credits. For description see Fields, Waves, and Antennas.

**585–586 Solar Terrestrial Physics I and II** 585, fall; 586, spring. 3 credits each term. Not offered 1986–87. 3 lecs. Physical processes in the earth's ionosphere and magnetosphere, the sun, solar corona, and the solar wind. Diagnostic techniques including solar and in situ observations; production, loss, and transport of charged particles in the ionosphere and magnetosphere: airglow, tides, winds, and gravity waves; electric fields generated by the solar wind and winds in the neutral atmosphere and their effects on transport processes; the equatorial and auroral electrojets; instabilities in space plasmas; basic structure of the sun and solar corona: the solar wind and its interaction with the magnetosphere; acceleration and drift of energetic particles in the magnetosphere; precipitation of particles and the aurora; magnetic and ionospheric storms.

**588 Electromagnetic Wave Propagation II** Spring. 3 credits. Prerequisites: EE 487 and 581 or permission of instructor. 3 lecs. Full-wave solutions of the wave equations; interactions between leaky modes and scattering of radio waves from random fluctuations in refractive index; scatter propagation, incoherent scatter from the ionosphere and its use as a diagnostic tool; scattering from unsta bilized plasma waves; pulse compression and other radar probing techniques; radio-star and satellite scintillations and their use as diagnostic tools.

**589 Magnetohydrodynamics** Spring. 3 credits. Prerequisite: EE 581. The theory of ideal and nonideal magnetohydrodynamical equations with emphasis on application to controlled thermonuclear fusion. Topics: derivation and domain of applicability; invariants; waves, equilibrium and normal-mode stability analysis; continuous spectrum; energy principle and applications to confinement geometries; nonideal effects, resistivity, finite Larmor radius stabilization. Selected additional topics such as dynamo theory or MHD turbulence.


**582 Nonlinear Phenomena in Plasma Physics** Fall. 3 credits. Prerequisite: EE 582. Single-particle motion, multiple-time-scale analysis and ponderomotive effects, weakly nonlinear waves and solitons, nonlinear Vlasov phenomena, quasilinear theory, resonance broadening and resonant mode-mode coupling, statistical theories of plasma turbulence, recent developments in stochasticity and chaos in plasma physics.

**Fields, Waves, and Antennas**

**303–304 Electromagnetic Fields and Waves** Fall and spring. 4 credits each semester. For description see Required Courses.

**487 Antennas and Propagation** Fall. 3 credits. Prerequisite: EE 304 or equivalent. 3 lecs. Aspects of antenna theory and design, thin-wire aperture and horn antennas; computer-aided design of antennas; path-loss and link-margin calculations; diffraction: refraction and ducting in the troposphere; propagation of radio waves and cold plasma waves in the ionosphere and magnetosphere, Alfvén, whistler-mode, and hybrid waves.

**533 Solid-State Microwave Devices and Circuits I** Fall. 4 credits. Prerequisite: EE 304. 2 lecs., 1 lab. Theoretical and experimental studies of circuits, amplifiers, oscillators, detectors, receivers, and electrical noise at microwave frequencies. Topics include: one- and two-port devices, stability, capacitance models, resistance amplifiers; oscillator load characteristics, locking and stabilization; microwave amplifiers; intermodulation effects; resistor and shot noise, noise figures, and CMOS noise. Laboratory makes use of the H-B 850A Automatic Network Analyzer and other microwave equipment.
534 Solid-State Microwave Devices and Circuits
Spring. 4 credits. Prerequisites: EE 533 and 435–436.
2 lecs., 1 lab.
Basic theories of the microwave operation of solid-state devices. The range of devices studied covers active two- and three-terminal devices, such as IMPATT, Gunn, Bartt, and tunnel devices, and MESFET, MOFET, and bipolar transistors. In addition, passive devices such as pin-switching diodes, varactor diodes, and detector diodes are studied. Studies of experimental methods of characterizing these devices include the use of advanced instrumentation such as the HP 8510A Automatic Network Analyzer and other microwave equipment.

583 Electrodynamics
Fall. 4 credits. Prerequisite: EE 304 or equivalent.
3 lecs.
Maxwell's equations, electromagnetic potentials, integral representations of the electromagnetic field, Green's functions, Special theory of relativity, Lorentz-Wiechert potentials, radiation from accelerated charges, Cerenkov radiation. Electrodynamics of dispersive dielectric and magnetic media. At the level of Classical Electrodynamics, by Jackson.

584 Microwave Theory
Spring. 4 credits.
Prerequisite: EE 304 or equivalent.
3 lecs., 1 rec. P. Monsant.

688 Advanced Electromagnetic Wave Propagation and Scattering
Spring. 3 credits.
Prerequisite: EE 487 or permission of instructor.
3 lecs.
Full-wave solutions of the wave equations, interactions between particles and waves, scattering of radio waves from random fluctuations in refractive-index, scatter propagation, incoherent scatter from the ionosphere and its use as a diagnostic tool, scattering from unstable plasma waves, pulse compression and other radar probing techniques, radio-star and satellite scintillations and their use as diagnostic tools.

General
315 Electrical Laboratory I
Fall. 4 credits.
For description see Required Courses.

316 Electrical Laboratory II
Spring. 4 credits.
For description see Required Courses.

442 Fundamentals of Acoustics (also T&M 666)
Spring. 3 credits.
3 lecs., biweekly lab.
For description see T&M 666.

480 Thermal, Fluid, and Statistical Physics for Engineers
Spring. 3 credits. Prerequisite: Physics 214.
R. Liboff

491–492 Senior Project
491, fall; 492, spring. 3 credits.
Individual study, analysis, and, usually, experimental tests in connection with a specific engineering problem chosen by the student after consultation with the faculty member directing the project. An engineering report on the project is required.

591–599 Graduate Topics in Electrical Engineering
1–3 credits.
Seminar, reading course, or other special arrangement agreed upon between the students and faculty members concerned.

691–692 Electrical Engineering Colloquium
Fall; 691, fall; 692, spring. 1 credit each term.
For students enrolled in the graduate Field of Electrical Engineering. Lectures by staff, graduate students, and visiting authorities. A weekly meeting for the presentation and discussion of important current topics in the field. Report required.

693–694 Electrical Engineering Design
Fall; 693, fall; 694, spring. 3 credits each term.
For students enrolled in the M.Eng. (Electrical) degree program. Utilizes real engineering situations to present fundamentals of engineering design.

695–696 Graduate Topics in Electrical Engineering
1–3 credits.
Seminar, reading course, or other special arrangement agreed upon between the students and faculty members concerned.

791–792 Thesis Research
Fall; 791, fall; 792, spring. 1–15 credits.
For students enrolled in the master's or doctoral program.

Geological Sciences

Freshman and Sophomore Courses

101 Introductory Geological Sciences
Fall, spring. 3 credits.
2 lecs., 1 lab, field trips, evening exams in the fall term. Fall, T. E. Jordan, A. L. Bloom, spring, W. B. Travers.
In order to better harmonize human endeavor with the natural earth we need to know what is natural on earth. This course teaches observation and understanding of landscape, including coasts, rivers, valleys, and glaciated regions; the genesis of earthquakes, volcanoes, and mountains; evidence for the drifting of continents and its consequences; and the origin, discovery, and development of mineral and water resources. The lab teaches use of topographic and geologic maps and recognition of minerals and rocks and includes field trips to Cascadilla Gorge, Fall Creek, and Enfield Glen.

102 Introduction to Historical Geology
Spring. 3 credits.
Prerequisite: Geol 101 or permission of instructor.
2 lecs., 1 lab, evening exams. J. L. Cisne.
A continuation of Geol 101. History of the earth and life in terms of evolutionary processes. The geologic record, its formation, and interpretation of earth history. Introduction to the evolution of life and to fossils and their use in reconstructing past environments and dating rocks.

107 Frontiers of Geology I
Fall. 1 credit. May be taken concurrently with or after Geol 101.
1 lec. J. L. Cisne and staff.
Lectures by members of the department on selected fundamental topics of current interest, such as continental drift and related tectonic processes, volcanoes, earthquake prediction, natural energy sources, and mineral resources.

108 Frontiers of Geology II
Spring. 1 credit. May be taken concurrently with or after Geol 101 or 102.
1 lec. J. L. Cisne and staff.
Lectures by members of the department on selected fundamental topics of current interest, such as plate tectonics, the evolution of mountain belts and island arcs, the deep structure of continents, ecology and evolution of fossil organisms, correlation of strata by fossils, sea-level changes, and fossil fuels.

201 Introduction to the Physics and Chemistry of the Earth (also Engr 201)
Spring. 3 credits.
Prerequisites: Mathematics 191 or 193, Physics 112, and Chemistry 207.
2 lecs., 1 rec. lab, or field trip. D. E. Karig.
For description see Engineering Common Courses.

210 Introduction to Field Methods in Geological Sciences
Fall. 2 credits. Prerequisite: Geol 101 or coregistration. Weekly field sessions.
D. E. Karig.
An introduction to the methods by which rocks are used as a geological database. Students will be introduced to the field methods used in the construction of geologic maps and cross sections and to systematic description of stratigraphic sections. Field and laboratory sessions are held on Saturday mornings until Thanksgiving.

212 Intersession Field Trip
January intersession. 1 credit. Prerequisite: Geol 101 or 201 or equivalent and permission of instructor. Travel and subsistence expenses to be announced. Not offered 1986–87. A trip of one week to ten days in an area of interesting geology in the lower latitudes. Interested students should contact the instructor during the early part of the fall semester.

214 Western Adirondack Field Course
Spring. 1 week at the end of the spring semester. 1 credit. Students should be prepared for overnight camping and will have to pay for their own meals.
W. A. Bassett.
Field mapping methods, mineral and rock identification, examination of Precambrian metamorphic rocks and lower Paleozoic sediments, talc and zinc mines.

262 Mineral and Energy Resources and the Environment
Spring. 3 credits. Offered alternate years. Not offered 1986–87.
2 lecs., 1 lab.
A topical look at mineral and energy resource systems, their organization, and some of the physical, temporal, economic, and political constraints within which they operate. Not a survey course in geology or economics; instead, the focus is on a few exemplary problems and commodities.

Junior, Senior, and Graduate Courses

of the following, the core courses Geol 326, 355, 356, and 357 and 388 may be taken by those who have successfully completed Geol 201 or the equivalent or who can demonstrate to the instructor that they have adequate preparation in mathematics, physics, chemistry, biology, or engineering.

326 Structural Geology
Spring. 4 credits.
Prerequisite: Geol 101 or 201, or permission of instructor.
3 lecs., 1 lab, field trips. R. W. Allmendinger.
Nature and origin of deformed rocks at microscopic to macroscopic scales, with emphasis on structural geometry and kinematics.

345 Geomorphology
Fall. 4 credits.
Prerequisite: Geol 102 or 201, or permission of instructor.
2 lecs., 1 lab. A. L. Bloom.
Origin of land forms and description in terms of structure, process, and stage.

355 Mineralogy
Fall. 4 credits.
Prerequisite: Geol 101 or 201, or permission of instructor.
2 lecs., 2 labs; assigned problems and readings.
W. A. Bassett.
Examination of minerals by hand-specimen properties and optical microscopy. Geological setting, classification, crystal structures, phase relations, chemical properties, and physical properties of minerals are studied. X-ray diffraction is introduced.

356 Petrology and Geochemistry
Spring. 4 credits.
Prerequisite: Geol 355.
2 lecs., 2 labs, 1 field trip, assigned problems and readings. R. W. Kay.
Principles of phase equilibrium as applied to igneous and metamorphic systems. Description, classification, chemistry, origin, regional distribution, and dating of igneous and metamorphic rocks. Geochemical distribution of trace elements and isotopes in igneous and metamorphic systems. The petrological evolution of the planets.


388 Geophysics and Geotectonics Spring. 4 credits. Prerequisites: Mathematics 192 and Physics 213 or equivalent. 3 lecs, 1 lab. B. L. Isacks. Global tectonics and the deep structure of the solid earth as revealed by investigations of earthquakes, earthquake waves, the earth's gravitational and magnetic fields, and heat flow.

410 Field Geology Summer 6 credits. Prerequisites: Geol 326 or permission of instructor. Six weeks at the Sierra Madre Field Camp, Wyoming. Fees, $1,650. W. B. Travers and staff. Field mapping techniques in igneous, metamorphic, and sedimentary rock, using topographic maps and air photos. The structural geology, petrology, geomorphology, and sedimentology of parts of the Overthrust Belt, Yellowstone-Jackson region, Hanna Coal Basin, Wind River, and Beartooth Mountains will be studied. An independent project and report will be done during the last week. Sierra Madre field geology is a joint program of the Cornell, Yale, and Harvard departments of geological sciences.

412 Experiments and Techniques in Earth Sciences Spring. 2 credits. Prerequisites: Physics 213 and Mathematics 192 or equivalents, or permission of instructor. S. Kaufman. Laboratory and field experiments chosen in accordance with students' interests. Familiarization with instruments and techniques used in earth sciences. Independent work is stressed.

424 Petroleum Geology Spring. 3 credits. Recommended: Geol 326. 2 lecs, 1 lab. W. B. Travers. Introduction to hydrocarbon exploration and development. Exploration techniques, including geologic use of well logs, fluid pressures, seismic-reflection methods, gravity, and magnetic measurements to map subsurface structures and stratigraphy. Petroleum origin and migration. Dispersal systems and depositional patterns of petroleum reservoirs. Economics of exploration, leasing, drilling and production, and estimates of petroleum reserves, including tar sands and oil shales.

431 The Earth's Crust: Structure, Composition, and Evolution Fall. 3 credits. Prerequisites: Geol 356 and 358. 3 lecs. L. D. Brown. Structure and composition of the crust from geophysical observations, analysis of xenoliths, and extrapolation of petrological laboratory data. Radioisotopic considerations. The nature of the crust-mantle boundary. Thermal and rheological structure of the crust. Oceanic versus continental crust. Origin and evolution of oceanic and continental crust.


434 Interpretation of Seismic Reflection Data Spring. 3 credits. Prerequisite: Geol 487 or equivalent. Offered alternate years. Not offered 1986–87. 2 lecs, 1 lab. A. L. Bloom. Glacial processes and deposits and the stratigraphy of the Quaternary Period.

442 Glacial and Quaternary Geology Spring. 3 credits. Prerequisite: Geol 345 or permission of instructor. Offered alternate years. Not offered 1986–87. 2 lecs, 1 lab; several Saturday field trips. A. L. Bloom. Glacial processes and deposits and the stratigraphy of the Quaternary Period.

453 Modern Petrology Fall. 3 credits. Prerequisite: Geol 356. Offered alternate years. Not offered 1986–87. 2 1/2 lecs, 1/2 lab. R. W. Kay. Magmas and metamorphism in the context of plate tectonics. Major and trace element chemistry and phase petrology as monitors of the creation and modification of igneous rocks. Temperature and stress in the crust and mantle and their influence on reaction rates and textures of metamorphic rocks. Application of experimental studies to natural systems. Reading from the literature and petrographic examination of pertinent examples.

455 Isotope Geology Fall. 3 credits. Prerequisite: Geol 356 or equivalent. 3 lecs. R. W. Kay. Nuclear-synthetic processes and the isotopic abundance of the elements. Dating by Pb, Ar, Sr, and Nd isotope variations. Theories of crustal and mantle evolution. Precambrian geochronology using U-series and 14C dating. Time constants for geochemical cycles. The use of U and H isotopes as tracers in the earth's hydrosphere, and hydrothermal circulation systems.

465 Chemical Geology Spring. 3 credits. Prerequisite: Geol 356 or equivalent. 2 lecs, 1 lab. W. A. Bassett, R. W. Kay. Crystallography and crystal chemistry of minerals and the methods of their study. Thermodynamic evaluation of homogeneous and heterogeneous equilibria and disequilibrium processes of geologic interest. Topics include crystal symmetry, mineral structures, X-ray diffraction, mineral equilibrium, and diffusion in minerals.

461 Mineral Deposits Fall. 4 credits. Prerequisite: Geol 356 or permission of instructor. Offered alternate years. Not offered 1986–87. 3 lecs, 1 lab, field trip. Staff. Introduction to mineral resources; sedimentary, magmatic, and hydrothermal ore deposits; topics in geochemistry; ore microscopy.

462 Mineral Exploration Spring. 3 credits. Prerequisite: Geol 461 or permission of instructor. Offered alternate years. Not offered 1986–87. 3 lecs, field trip. Staff. Exploration geochemistry, geophysics, and geology; design of exploration programs; topics in economic geology.

474 Modern Depositional Systems Spring. 3 credits. Prerequisite: Geol 375 or permission of instructor. Offered alternate years. Not offered 1986–87. 3 lecs. T. E. Jordan. Compositions, textures, sedimentary structures, and facies variations of sediments in modern depositional environments. Clastic and carbonate environments; clastic and carbonate systems; carbonate bank and sabkha systems. Required field trip during spring recess to region of modern examples and/or rock sequences demonstrating ancient examples.

476 Sedimentary Basins: Tectonics and Mechanics Spring. 3 credits. Prerequisite: Geol 375 or permission of instructor. Offered alternate years. Not offered 1986–87. 3 lecs. T. E. Jordan. Subsidence of sedimentary basins from the point of view of plate tectonics and geomechanics. Interactions of subsidence, sediment supply, and environmental characteristics in development of stratigraphic sequences. Framework of deep oceans; active margin, passive margin, and continental basins; and stratigraphic variability. Topics include sedimentary petrology, geophysical modeling, and the role of sea-level fluctuations. Modern and ancient examples.

479 Paleobiology (also Biological Sciences 479) Fall. 3 credits. Prerequisites: Biological Sciences 101–102 and 103–104 or equivalent, and either Geol 375, Biological Sciences 274, or permission of instructor. 3 lecs. J. L. Glinne and staff. Survey of the major groups of organisms and their evolutionary histories. Intended to fill out the biological backgrounds of geology students and the geological backgrounds of biology students concerning the nature and significance of the fossil record for their respective studies.

487 Geophysical Prospecting Fall. 3 credits. Prerequisites: Physics 213 and Mathematics 192 or equivalents, or permission of instructor. 2 lecs. S. Kaufman. Physical principles, instrumentation, operational procedures, and interpretation techniques in geophysical exploration for oil, gas, and minerals. Seismic reflection, seismic refraction, gravity, and magnetic and electrical methods of exploration.

489 Earthquakes and Tectonics Fall. 3 credits. Prerequisite: Geol 101 or 201, Mathematics 192, Physics 213, or permission of instructor. Offered alternate years. 3 lecs. B. L. Isacks. The mechanisms of earthquakes revealed by seismic-wave radiation and by near-source studies of faulting and surface deformation; relationships to regional tectonics; earthquake hazard and prediction.

490 Honors Thesis (B.A. degree candidates) Fall, spring. 2 credits. Staff. (D. E. Karig and A. L. Bloom, coordinators). An introduction to the techniques and philosophy of research in the earth sciences and an opportunity for undergraduates to participate in current staff research projects. Topics chosen in consultation with, and guided by, a staff member. A short written report is required, with outstanding projects to be prepared for publication.

491–492 Undergraduate Research Fall, spring. 1 credit. Staff. (D. E. Karig and A. L. Bloom, coordinators). An introduction to the techniques and philosophy of research in the earth sciences and an opportunity for undergraduates to participate in current staff research projects. Topics chosen in consultation with, and guided by, a staff member. A short written report is required, with outstanding projects to be prepared for publication.

600–699 Seminars and Special Work Fall, spring. 1–3 credits. Prerequisite: permission of instructor. Advanced work on original investigations in geological sciences. Topics change from term to term.

621 Tectonic and Stratigraphic Evolution of Sedimentary Basins W. B. Travers.

622 Advanced Topics in Structural Geology R. W. Allmendinger.

722 Advanced Structural Geology I Spring. 3 credits. Prerequisites: Geol 326 and permission of instructor.
2 lecs, 1 lab, possible weekend field trips. D. E. Karig, R. W. Allmendinger.
Stress-strain theory and application. Advanced techniques of structural analysis. Topics include finite and incremental strain measurement; microstructure, preferred orientation, and TEM analysis; pressure solution and cleavage development; and experimental deformation. Applications to deformation of unconsolidated sediments, brittle and brittle-ductile deformation of supracrustal strata, and ductile deformation of high-grade metamorphic rocks. Kinematic analysis of shear zones and folds in these regimes.

724 Advanced Structural Geology II Spring. 3 credits. Prerequisites: Geol 326 and permission of instructor. Offered alternate years. Not offered 1986–87. 2 lecs, 1 lab, spring-recess trip. R. W. Allmendinger, D. E. Karig.
Geometry, kinematics, and mechanics of structural provinces. Concentration on thrust belts, rift provinces, or strike-slip provinces. Techniques of balanced cross sections.]

728 Geology of Orogenic Belts Spring. 4 credits. Prerequisite: permission of instructor. T R 10:10-12:05. J. M. Bird.
A seminar course in which students study specific geologic theme of an orogenic belt selected for study during the term. The course is intended to complement Geol 781.

735 Advanced Geophysics I Fall. 3 credits. Prerequisite: Geol 388. Not offered 1986–87. 3 lecs. D. L. Turcotte.
Mantle convection, heat flow, the driving mechanism for plate tectonics, the energy balance, definition of the lithosphere.] 

Gravity figure of the earth, earth tides, magnetism, mechanical behavior of the lithosphere, changes in sea level.

781 Geotectonics Fall. 4 credits. Prerequisite: permission of instructor. 2 lecs. J. M. Bird.

787 Seismology Fall. 3 credits. Prerequisite: T&M 611 or equivalent. Offered alternate years. Not offered 1986–87. 3 lecs-recs. B. L. Isacks.
Generation and propagation of elastic waves in the earth. Derivation of the structure of the earth and the mechanism of earthquakes from seismological observations. 

Materials Science and Engineering

Undergraduate Courses

122 Composite Materials: Design and Applications (also Engr 122) Fall. 3 credits. 2 lecs, 1 lab or rec.
For description see Engineering Common Courses.

201 Elements of Materials Science (also Engr 111) Fall, spring. 3 credits. Automatic.
For description see Engineering Common Courses.

261 Introduction to Mechanical Properties of Materials (also Engr 261) Fall, spring. 3 credits. 2 lecs, 1 rec or lab.
For description see Engineering Common Courses.

262 Introduction to Electrical Properties of Materials (also Engr 262) Spring. 3 credits. 2 lecs, 1 rec or lab.
For description see Engineering Common Courses.

331 Structural Characterization and Properties of Materials Fall. 4 credits. 3 lecs, 1 lab.

332 Electrical and Magnetic Properties of Materials Spring. 3 credits.

333 Research Involvement I Fall. 3 credits. Prerequisite: approval of department.
Semi-independent research project in association with faculty member and faculty research group of the department. Students design equipment and/or experiments and present results. Creativity and synthesis are emphasized. Typical projects have involved hot isostatic compaction, sputter etching, mechanical testing of polymer films, and relation of properties to microstructure.

334 Research Involvement II Spring. 3 credits. Prerequisite: approval of department.
May be a continuation of MS&E 333 or a one-term affiliation with a research group.

335 Thermodynamics of Condensed Systems Fall. 3 credits. 3 lecs.
The three laws of thermodynamics are introduced as a basis for understanding phase equilibria, heterogeneous reactions, solutions, electrochemical processes, surfaces, and defects. Examples of design and control of materials processing and microstructure are discussed.

336 Kinetics, Diffusion, and Phase Transformations Spring. 3 credits. 3 lecs.
Introduction of absolute rate theory, atomic motion, and diffusion. Applications to nucleation and growth of new phases in vapors, liquids, and solids; solidification, crystal growth, oxidation and corrosion, radiation damage, recrystallization, gas-metal reactions, and thermomechanical processing to produce desired microstructures and properties.

345 Materials and Manufacturing Processes (also M&AE 312) Spring. 3 credits. Prerequisite: T&M 202 or permission of instructor. 2 lecs, 1 lab.
For description see M&AE 312.

441 Microprocessing of Materials Fall. 3 credits. 3 lecs, occasional lab.
Introduction to engineering and design of large-scale integrated circuits. All the major processing steps involved in fabrication are considered. Metalurgical processing for winning high-purity silicon from SiO2, single-crystal growth, zone melting and zone refining,
Burton-Prim-Shlichter theory of the effective distribution coefficient, epitaxial growth of silicon. Thermal oxidation of silicon. A comparative theoretical study of solid-state diffusion with specific application to the doping of silicon to form integrated circuit devices (e.g., resistors, diodes, and bipolar transistors). Evaluation of diffused layers by electrical measurements. Linhard-Scharf-Schiott theory of ion implantation; stopping power, electronic and nuclear energy-loss mechanisms, range and damage profiles. Application of ion implantation to the fabrication of the MOSFET (metal-oxide semiconductor field-effect transistor). Etching, metallization, photolithography, metal-semiconductor contacts, failure due to electromigration effects.

442 Macroprocessing (also M&AE 512) Spring. 3 credits. 3 lecs.
Deformation processing of materials, including superplastic forming, sheet-metal forming, massive forming, and powder processing. Time, temperature, and strain-rate effects in warm-forming and hot-forming. Characterization of powder-compaction mechanisms and their use in process design. Forming-limit diagrams. Development of microstructure-based criteria for fracture in large deformations. Optimization and design of forming processes. Development of constitutive equations for superplastic flow. Design of a superplastic forming process starting from basic mechanisms. The course includes a comprehensive experimental project in which the constitutive equations for superplastic flow are developed. Student teams design and manufacture experimental equipment for analysis and evaluation of a material's properties and performance in terms of its processing history and microstructure.

443-444 Senior Materials Laboratory 443, fall; 444, spring. 3 credits.
Projects are available in plasticity of metals and ceramics, mechanical and chemical processing, phase transformations, electrical and ionic conductivity, analysis of defects by electron microscopy, sintering, crystal growth, etc. Emphasis is placed on design of experimental equipment for analysis and evaluation of a material's properties and performance in terms of its processing history and microstructure.

445 Mechanical Properties of Materials Fall. 3 credits. 3 lecs.
Relation between stress, strain, concept of equivalent stresses and strains, such as plastic, elastic, plastic, fatigue, fracture toughness, and rupture. The properties and their variation with time in the context of the problem of the microstructure with lattice defects. Application of these principles to the design of improved materials.

447 Materials Design Concepts I Fall. 1 credit.
Speakers from industry and other institutions will give case studies of design problems. Students will write a proposal for a design study project, which will be approved by the instructor. At the level of Engineering Design, by Dieter.

448 Materials Design Concepts II Spring. 2 credits. Prerequisite: MSE 447
Each student is expected to complete an extensive design study project and give a fifty-minute talk on a materials-design project. The course includes a discussion of economic factors and constraints as well as the design of processes and the selection of materials. At the level of Engineering Design, by Dieter.

449 Introduction to Ceramics Fall. 3 credits. Prerequisite: MSE 331 or permission of instructor. 3 lecs.
Engineering applications of ceramic materials and processes. Crystal structure and ionic bonding of ceramic materials; structure of glasses; point defects, point-defect chemistry and relation to nonstoichiometry, line defects and grain boundaries; diffusion in stoichiometric and nonstoichiometric oxides; phase diagram concepts and the design of glass-ceramics; grain growth and sintering.

450 Physical Metallurgy Spring. 3 credits.
The service and design requirements of engineering alloys, the testing and characterization of materials, and the analysis and design of alloys for various engineering requirements, such as ASME design codes.

452 Properties of Solid Polymers Spring. 3 credits. Prerequisite: Engr 261 or permission of instructor.
3 lecs.

454 Processing of Glass, Ceramic, and Glass-Ceramic Materials Spring. 3 credits. Offered alternate years.
Conventional and unconventional techniques for processing glass, glass-ceramic, and ceramic materials. Case studies illustrate the design, engineering, and scientific aspects of such processes. Vapor processes for high-purity optical fibers, hot-processing of ceramic turbine blades, photosensitive materials, and powder processing and sintering of ceramics will be discussed. This course is taught with two scientists from the research and development laboratory of Corning Glass Works.

455 Analysis of Manufacturing Processes (also M&AE 512) Spring. 3 credits. Prerequisite: M&AE 312.
3 recs.
For description see M&AE 512.

459 Physics of Modern Materials Analysis Fall. 3 credits.
The interplay of electrons, ions, and photons with solids, and the characteristics of the emergent radiation in relation to the structure and composition of materials. Aspects of atomic physics that are necessary for understanding techniques of modern materials analysis, such as Auger electron spectroscopy, x-ray scattering, and secondary ion mass spectrometry.

463 Materials Design in Electronic Packaging Fall. 3 credits.
Design and materials needs for packaging technology, from chip to board. Principles involved in key areas of materials science, such as adhesion and metallization. Packaging materials to be discussed include metals, ceramics, and polymers.

Graduate-Level Professional Courses

553-554 Special Project 553, fall; 554, spring. 6 credits each term.
Research on a specific problem in the materials area.

Graduate Core Courses

601 Thermodynamics of Materials Fall. 3 credits.

602 Elasticity and Physical Properties of Crystals Fall. 3 credits.
Ceramic transducers, elastic stress and strain, constitutive relations between stress and strain, symmetry of crystals, generalized tensor representation of elasticity and other reversible and irreversible properties of crystals; mathematical theory of infinitesimal elasticity with applications, including wave propagation and stress fields of dislocations; mathematical theory of yield stress and plasticity; origin of elastic behavior, including rubberlike behavior. At the level of Physical Properties of Crystals, by Nye.

603 Structural Defects in Solids Spring. 3 credits. Prerequisites: MS&E 601 and 602, or equivalent.

604 Kinetics of Solid-State Reactions Spring. 3 credits.

605 Plastic Flow and Fracture of Materials Fall. 3 credits.
Experimental and theoretical aspects of the deformation and failure of structural materials. Although the emphasis is on metals and alloys, consideration is given also to glasses, ceramics, and polymeric materials. Some of the topics are theory and practice of mechanical testing, deformation behavior of polycrystal and single-crystal metals, phenomenological theories of deformation, fracture, and deformation of superplastic forming, sheet-metal forming, massive forming, and powder processing. Time, temperature, and other reversible and irreversible properties of solids, and the characteristics of the emergent radiation in relation to the structure and composition of materials. Aspects of atomic physics that are necessary for understanding techniques of modern materials analysis, such as Auger electron spectroscopy, x-ray scattering, and secondary ion mass spectrometry.

Related Course in Another Department

Introductory Solid-State Physics (Physics 454)

Further Graduate Courses

610 Principles of Diffraction (also A&EP 711) Fall. 3 credits. Offered alternate years. For description see A&EP 711.

612 Phase Transformations 3 credits. Prerequisite: MS&E 601 and 604 or equivalent preparation.
Computational and structural transitions in condensed systems, including spinodal decomposition, cellular transformations, and diffusionless transformations; clustering and ordering in solid solutions; radiation-induced precipitation; condensation and evaporation phenomena; order-disorder transformations; transitions in magnetic, ferroelectric, and superconducting materials; phase equilibria and transitions in surface and at grain boundaries; phase transformations in metallic, ceramic, semiconducting, and polymeric systems. Thermodynamic, statistical thermodynamic, structural, and kinetic aspects of the transitions. Modern methods of observation. At the level of The Theory of Transformations in Metals and Alloys, by Christian; Critical Phenomena in Alloys, Magnets and Superconductors, edited by Mills, Ascher, and Jaffe; and current review articles.

614 Electron Microscopy Spring. 3 credits.
Electron optics, Abbe theory of image formation with applications to the direct imaging of small defects and atomic planes. Kinematical theory of diffraction with applications to the study of the structure of grain boundaries and the imaging of crystal defects.
Dynamical theory of diffraction as applied to the calculation of the images of crystal defects. Instruction in the use of the microscope.

616 Electrical and Magnetic Properties of Materials 3 credits. Prerequisite: Physics 454 or equivalent. Electromagnetic transport properties of metals and semiconductors, semiconductor devices, optical and dielectric properties of insulators and semiconductors, laser materials, dielectric breakdown, structural aspects of superconducting materials, ferromagnetism and magnetic materials. At the level of Physics of Semiconductor Devices, by Sze, Ferromagnetism, by Bozorth; and current review articles.

Specialty Courses

702 Amorphous and Semicrystalline Materials 3 credits. Prerequisite: Physics 454 or equivalent. Topics related to the science of the amorphous state, selected from within the following general areas: structure of liquids and polymers; rheology of elastomers and glasses; electrical, thermal, and optical properties of amorphous materials. Presented at a level of Modern Aspects of the Vitreous State, by Mackenzie; Glass Transitions, by Shen and Eisenberg, in Progress in Solid State Chemistry; and The Physics of Rubber Elasticity, by Treloar.

703 Solid Surfaces and Interfaces 3 credits. Prerequisites: MS&E 601 and some knowledge of solid-state physics. Similar to A&EP 762. Offered alternate years. Topics to be covered include atomic structure of surfaces, surface statistical thermodynamics, interaction of surfaces with gases, defects at surfaces, surfaces of alloys, semiconductor and insulator interfaces, heterogeneous catalysis, mass transport, oxidation of crystals.

704 Advanced Topics in Crystal Defects 3 credits. Prerequisites: MS&E 601, 602, and 604, or equivalent. The structure and properties of point, line, and planar crystal defects treated from a fundamental point of view. Thermodynamics and kinetics of point defects. Acoustic and continuum theories of dislocations. Thermodynamic treatment of grain boundaries. Structure of grain boundaries. Emphasis given throughout to interactions between the various types of defects and to their roles in important phenomena such as diffusion, precipitation, plasticity, radiation damage. Cross section for atom displacement; orientation dependence of the threshold energy; interatomic potentials; the atomic collision cascade; focusing of atomic collisions; mass transport along collision spectra within a cascade; range concepts and measurements in polycrystalline and single-crystal metals and semiconductors; channelled particles and the effect of crystal imperfections on the range. Rutherford back scattering and channeling and their application to the lattice location of impurity atoms; sputtering of single and polycrystalline materials; recovery mechanisms for radiation damage; void formation in metals irradiated to high fluences, and the problem of swelling in liquid-metal fast-breeder reactors; the first-wall problem in controlled thermonuclear reactors. At the level of Defects and Radiation Damage in Metals, by M.W. Thompson; The Observation of Atomic Collisions in Crystalline Solids, by K. S. Nelson; Measurement of Solids, by S. G. Carter and J. S. Colligon; and selected papers and review articles.

706 Amorphous Semiconductors 2 credits. Prerequisite: knowledge of the theory of crystalline semiconductors on the level of Kittel. The preparation, characterization, and electronic transport of amorphous semiconductors from an experimental point of view. Particular emphasis is given to amorphous, hydrogenated Si. Some potential device applications such as in amorphous Si solar cells and the metal-base transistor.

707 Solar Energy Materials 3 credits. Photovoltaic energy conversion: (1) theory (on the level of Howel); (2) the role of crystal defects and grain boundaries on the conversion efficiency, and schemes to passivate these defects; (3) current investigations in the JPL program to produce large quantities of solar-grade semiconducting Si.

708 Ceramic Materials 3 credits. Prerequisites: MS&E 601 and some familiarity with crystal structures. Crystal structure and bonding of typical ceramic materials; structure of silicate and nonsilicate glasses; imperfections in oxides; point defects and point-defect chemistry; line defects, extended defects; diffusion in stoichiometric and nonstoichiometric ceramics; phase transformations; equilibrium and nonequilibrium phases; grain growth and sintering; plastic deformation and creep; topics from research papers.

775 Advanced Topics in Mechanical Properties 3 credits. Prerequisite: MS&E 605 or permission of instructor. Topics from current research in mechanical properties of structural materials, selected from the following: modern theories of deformation, high-strength alloys, effects of nuclear irradiation, amorphous solids, cyclic deformation and fatigue, fracture of brittle and ductile solids, anelasticity and internal friction. Lectures are based largely on current literature.

779 Special Studies in Materials Sciences Fall, spring. Variable credit. Supervised studies of special topics in materials science.

798 Materials Science and Engineering Colloquium Fall, spring. 1 credit each term. Credit limited to graduate students. Lectures by visiting scientists, Cornell staff members, and graduate students on subjects of interest in materials sciences, especially in connection with new research.

979 Materials Science Research Seminars Fall, spring. 2 credits each term. For graduate students involved in research projects. Short presentations on research progress by students and staff.

800 Research in Materials Science Fall, spring. Credit to be arranged. Prerequisite: candidacy for Ph.D. in materials science. Independent research in materials science under the guidance of a member of the staff.

801 Research in Materials Science Fall, spring. Credit to be arranged. Prerequisite: candidacy for M.S. in materials science. Independent research in materials science under the guidance of a member of the staff.

Mechanical and Aerospace Engineering

General and Required Courses


102 Drawing and Engineering Design (also Engr 102) Fall, spring. 1 credit. Half-term course offered twice each semester. Enrollment limited. Recommended for students without previous mechanical drawing experience. S-U grades optional. 2 lecs, 1 lab. For description see Engineering Common Courses.

117 Introduction to Mechanical Engineering (also Engr 117) Fall. 3 credits. 2 lecs, 1 lab. For description see Engineering Common Courses.

119 Introduction to Manufacturing Engineering (also Engr 119) Spring. 3 credits. Not offered after 1966-67. 2 lecs, 1 lab. For description see Engineering Common Courses.

221 Thermodynamics (also Engr 221) Fall, spring. 3 credits. Prerequisites: Mathematics 191 and 192 and Physics 112. For description see Engineering Common Courses.

302 Technology, Society, and the Human Condition Summer. 3 credits. Limited to upperclass engineers and other students who have received permission of instructor. S-U grades optional. Approved social science elective. B. J. Costa. An introduction to the history of technology from the origin of man to the present. Emphasis is on the social and human consequences of technology rather than on internal or gadget history. Of primary interest are the nineteenth and twentieth centuries and the pervasive effects of industrialization—a process that began with manufacturing and was rapidly extended to agriculture, culminating in what Ivan Illich has called the industrialization of man. Among the current topics included are the transition from an economy of abundance and affluence to one of impending shortages and limits to growth, alternative life styles, alternative energy sources and systems, and the growing interest in intermediate or appropriate technology.

312 Fundamentals of Manufacturing Processes (also MS&E 345) Spring. may be offered in Engineering Cooperative Program. 3 credits. Prerequisites: Engr 202 and 261, or permission of instructor. 2 lecs, 1 lab, evening exams may be given. M. C. Lee. Yield criteria and plastic flow. Manufacturing processes for engineering materials, including metals, polymers, ceramics, and composites. Casting, forming, material removal, and joining processes.

323 Introductory Fluid Mechanics Fall; usually offered in Engineering Cooperative Program. 4 credits. Prerequisites: Engr 202 and 203 and coregistration in 221, or permission of instructor. 4 recs, evening prelims. Statics, kinematics, potential flow, dynamics, momentum and energy relations. Thermodynamics of compressible flow; dimensional analysis; real fluid phenomena, laminar and turbulent motion, boundary layer, lift and drag, supersonic flow and shock waves.


325 Mechanical Design and Analysis Fall, spring; usually offered in Engineering Cooperative Program. 4 credits. Prerequisites: Engr 202 and 203. 3 lecs, 1 lab.
Application of the principles of mechanics and materials to problems of analysis and design of mechanical components and systems.

326 Systems Dynamics Spring; may be offered in Engineering Cooperative Program. 4 credits. Prerequisites: M&AE 325, 351. 3 lecs., 1 lab, evening prereqs. S. L. Phoenix. Dynamic behavior of mechanical systems, modeling, analysis techniques and applications, vibrations of single and multi-degree-of-freedom systems, linear control systems. PDF control, stability analysis. Computer simulation (CADIF) and experimental studies of vibration and control systems.

327 Mechanical Engineering Laboratory Fall. 4 credits. Prerequisites: M&AE 324 and 326. 1 lec, 2 labs. Laboratory exercises in instrumentation, techniques, and methods used in mechanical engineering. Measurements of pressure, temperature, heat flow, drag, fluid-flow rate, shock-wave phenomena, displacement force, stress, strain, vibrations, noise, and engine performance.

Mechanical Systems and Design and Manufacturing

464 Design for Manufacture Spring. 3 credits. Prerequisites: M&AE 312 and 325, or permission of instructor. R. L. Wehe. Design for casting, forging, stamping, welding, machining, heat treatment, and assembly; beneficial prestressing; improving the distribution of loads and deflections. Selection of materials; dimensioning and fits, joints, fasteners, and shaft mountings. Specifications for manufacturing and maintenance to minimize fatigue failures and improve reliability. Short design problems.

465 Biomechanical Systems—Analysis and Design Fall. 3 credits. Prerequisites: Engr 202 and 203. 3 lecs. D. L. Bartel. Selected topics from the study of the human body as a mechanical system. Emphasis on the modeling, analysis, and design of biomechanical systems frequently encountered in orthopedic surgery and physical rehabilitation.

486 Automotive Engineering Spring. 3 credits. Prerequisite: M&AE 325. Selected topics in the analysis and design of vehicle components and systems. Emphasis is on automobiles, trucks, and related vehicles. Power plant, driveline, brakes, suspension, and structure. Other vehicle types may be considered.

489 Computer-aided Design Spring. 3 credits. Limited to juniors and seniors. A first course in CAD, assuming completion of a course in programming. May be taken either before or in conjunction with a numerical methods course. Fulfills computer applications requirement.

2 lecs., 1 sec. of computational assignments at CADIF. The use of software and computer methods in the solution of mechanical engineering problems. Use of commercial software (drafting, solid modeling, finite-element analysis, simulation, etc.) as appropriate. Topics include simulation (ordinary differential equations), optimization, solution of field equations (finite element, finite difference), least squares, geometry (space curves, splines, patches), and computer graphics.

512 Analysis of Materials Processing (also M&AE 442) Spring. 3 credits. Prerequisite: M&AE 312. 3 lecs. R. Raj. Review of basic principles of plasticity and inelastic behavior of crystalline solids. Application of slab models, bound theorems, and slipline theory to problems of forging, extrusion, and rolling. Analysis of sheet-metal forming, including forming limits and springback. Discussion of defect initiation during the forming process.

514 Numerical Control in Manufacturing Fall. 3 credits. Prerequisite: upperclass standing in engineering. 3 lecs. K. K. Wang. Principles and the state of the art of numerical control (NC) technology; design considerations and programming methods for NC and computerized NC (CNC) machine tools; geometric modeling of surfaces and solid objects; NC code generation and verification; computer-aided manufacturing (CAM) systems.


563 Mechanical Components Spring. 3 credits. Prerequisite: M&AE 325. Not offered 1986–87. Advanced analysis of machine components and structures. Application to the design of new configurations and devices. Selected topics from the following: lubrication theory and bearing design, fluid drives, shells, thin cylinders, rotating disks, fits, elastic-plastic design, thermal stresses, creep, impact, indentation and curved beams, plates, contact stresses.

569 Mechanical and Aerospace Structures I Fall. 3 credits. Prerequisite: M&AE 325 or permission of instructor. J. F. Booker. A study of advanced topics in the analysis of stress and deformation of elastic bodies, with applications to the analysis and design of mechanical and aerospace systems.

575 Microprocessor Applications Fall. 3 credits. Enrollment limited; intended for graduate students with limited background in digital circuitry; open to undergraduates with permission of instructor. Prerequisite: background in basic laboratory electronics. Fulfills computer applications requirement.

2 lecs., 1 lab. Introduction to digital circuitry, microprocessors, and microprocessor-based data acquisition and control systems. Basic concepts of data representation, microprocessor and microcomputer structure, parallel and serial input/output, analog-to-digital conversion, and hardware and software requirements for interfacing. Emphasis on applications of the 6502 microprocessor and assembly language programming. Independent laboratory work on several applications projects, including the process control and data-acquisition procedures.

577 Mechanical Vibrations Spring. 3 credits. Open to qualified undergraduates. Prerequisite: M&AE 326 or equivalent.

2 lecs., 1 lab. R. M. Phelan. Further development of vibration phenomena in single-degree- and multidegree-of-freedom linear and nonlinear systems, with emphasis on engineering problems involving analysis and design.

578 Feedback Control Systems Fall. 3 credits. Open to qualified undergraduates. Prerequisite: M&AE 326 or permission of instructor.

2 lecs., 1 lab. R. M. Phelan. Further development of the theory and implementation of feedback control systems, with particular emphasis on the application of pseudo-derivative-feedback (PDF) control concepts to the design and operation of linear and nonlinear systems.

583 Mechanical Reliability and Fracture Fall. 3 credits. Prerequisites: Engr 260 or 270 or equivalent. S. L. Phoenix. Basic concepts of fracture mechanics, stress concentration factors, Griffith energy criterion, stress fields around crack tips, stress intensity factors, mode I to III cracks, fracture toughness, models of the crack-tip plastic zone, fatigue crack-propagation laws. Weibull distribution as a model for strength, statistical theory of fiber bundle strength, models for composite strength and fatigue, kinetic basis of fatigue laws including temperature effects, selected design problems.

589 Computer-aided Research, Design, and Development Fall. 3 credits. Prerequisite: M&AE 489 or equivalent. 2 lecs., computational assignments at CADIF. D. L. Taylor. Introduces students to a wide range of topics and programming techniques that are useful in the development of engineering models for computer analysis. Emphasis on data structure and integration of existing packages. Extensive use of computer graphics. Intended to prepare students to take an active role in the development of CAD software. Topics include computer graphics, data structures, 3-D modeling, role of new languages (LISP, PROLOG, etc.), and program development and debugging.

615 Composite Materials (also T&AM 555 and M&AE 615) Spring. 4 credits. Prerequisites: Engr 202 and Eng 361 or graduate standing or permission of instructor. Brief history of composite materials; types, geometries, fiber types, and structures; polymer matrices and deformation properties; anisotropy; stress-strain analysis of lamina and laminates; micromechanics of deformation and stress transfer, effective moduli, theories of strength and fatigue, nondestructive testing and inspection, applications of composites, environmental effects.


P. R. Dawn. Application of advanced numerical techniques for the analysis of materials processing, including the use of elastic-plastic, viscoplastic, and viscoelastic models for analyzing deformation during large-strain forming operations. Emphasis is on the finite element, stress-strain analysis of lamina and laminates, micromechanics of deformation and stress transfer, effective moduli, theories of strength and fatigue, nondestructive testing and inspection, applications of composites, environmental effects.

670 Mechanical and Aerospace Structures II Spring. 4 credits. Prerequisite: M&AE 569 or permission of instructor. Fulfills computer applications requirement.

J. F. Booker. Introduction to modern computational techniques, particularly finite-element analysis and related matrix methods, for static and dynamic analysis of mechanical and aerospace structures and related nonlinear structural applications such as conductive heat transfer. Primary emphasis on underlying mechanics and mathematics. Secondary consideration of inherent capabilities and limitations of large-scale general-purpose structural mechanics programs such as NASTRAN, ANSYS, and SAP4. Introduction to computational approaches and development of small program segments and application of existing larger programs, using micro-, mini-, and mainframe computers. Term project.

672 Experimental Methods in Machine Design Fall. On demand. 4 credits. Prerequisite: M&AE 325 or equivalent.

1 rec, 2 labs. Investigation and evaluation of methods used to obtain specifications for manufacturing and maintenance to problems of analysis and design of mechanical components and systems.
design and performance data. Photoelasticity, strain measurement, photography, vibration and sound measurement, transducers.

676 Advanced Mechanical Vibrations

On demand. 4 credits. Prerequisite: M&AE 577 or equivalent, graduate standing, or permission of instructor.

2 lecs, 1 lab, computer assignments at CADIF.

D. L. Taylor.

Response of multi-degree-of-freedom systems, including damping, with emphasis on computer techniques. Matrix formulation, solution of the eigenproblem, calculation and interpretation of frequency response and complex mode shapes. Nonconservative systems, self-excited oscillations, nonlinear vibrations, and limit-cycle analysis. Introduction to random vibrations and vibrations of elastic bodies. Computational activities include use of CAD packages to perform system identification by impulse testing, single-point sine sweep, and single-point random excitation.

679 Digital Simulation of Dynamic Systems

Fall. 4 credits. Open to qualified undergraduates with permission of instructor. Prerequisite: previous exposure to systems dynamics and digital programming.

J. F. Booker.


680 Random Vibration (also CEE 671)

Fall. On demand. 4 credits. Prerequisites: Engr 260 or M&AE 326 or equivalent, graduate standing, or permission of instructor.

Probabilistic descriptors of linear and nonlinear systems, stochastic inputs with Gaussian and other distributions, random vibration analysis and design, coherence and autocorrelation functions, power spectral densities, first-passage time distributions, applications to fatigue studies, structural response to wind and wave forces, seismic analysis, chaotic vibration of nonlinear systems. Interactive computer programs with graphics in the CADIF facility are used.

682 Hydrodynamic Lubrication: Fluid-Film Bearings

Fall, on demand. 4 credits. J. F. Booker.

Theory of hydrodynamic lubrication and its application to the analysis and design of fluid-film bearings. General topics include viscous flow in thin films, self-acting and externally pressurized bearings with liquid and gas lubricant films, bearing-system dynamics, and computational methods. Also selected special topics such as elastohydrodynamic lubrication.

684 Advanced Mechanical Reliability

Fall, on demand. 4 credits. Prerequisite: M&AE 483 or permission of instructor.

S. L. Phoenix.

Advanced course in random loading and statistical failure processes in mechanical systems. Continuous and discrete random loadings, random vibrations of mechanical structures, random fatigue processes in materials; order statistics and statistical estimation of reliability, simulation, and computation in mechanical structures; coherent systems and monotone load-sharing, stochastic failure of bundles and compostes.

685 Optimum Design of Mechanical Systems

Fall. 4 credits. Prerequisite: graduate standing or permission of instructor.

3 lecs. D. L. Bartel.

The formulation of design problems frequently encountered in mechanical systems as optimization problems. Theory and application of methods of mathematical programming for the solution of optimum design problems.

Energy, Fluids, and Aerospace Engineering

405 Introduction to Aeronautics

Fall. 3 credits. Limited to upperclass engineers, others with permission of instructor.

D. A. Caughey.


439 Acoustics and Noise

Spring. 3 credits.

Prerequisite: some knowledge of fluid mechanics or permission of instructor. Not offered 1986–87.

A. R. George.


441 Advanced Thermodynamics with Energy Applications

Spring. 3 credits. Prerequisite: M&AE 221 and 323 or permission of instructor. Not offered 1986–87.

Review of thermodynamics. Applications to phase changes, heat engines, and combustion. Magnetohydrodynamics and boundary layer problems. Statistical thermodynamics and applications to lasers and semiconductors.

449 Combustion Engines

Spring. 3 credits.

Prerequisite: Engr 221 and M&AE 323.

3 lecs. E. L. Resler, Jr.

Introduction to combustion engines, with emphasis on application of thermodynamics and fluid dynamics. Air-standard analyses, chemical equilibrium, ideal-cycle analyses, deviations from ideal processes. Combustion knock. Formation and control of undesirable exhaust emissions.

506 Aerospace Propulsion Systems

Spring. 3 credits. Prerequisite: M&AE 323 or permission of instructor. Offered alternate years. Not offered 1986–87.

3 lecs. D. G. Shepherd.

Application of thermodynamics and fluid mechanics to design and performance of thermal-jet and rocket engines. Mission analysis in space. Auxiliary power supply; study of advanced methods of space propulsion.

507 Dynamics of Flight Vehicles

Spring. 3 credits. Prerequisites: M&AE 405 and Engr 203; or permission of instructor. Offered alternate years.

D. A. Caughey.


530 Fluid Dynamics

Fall. 3 credits. Prerequisite: M&AE 323 and senior or graduate standing or permission of instructor.

F. K. Moore.

Inviscid fluid dynamics and aerodynamicics, including incompressible and supersonic flows, flow over bodies, lift, and drag. Shock waves. Courses 530 and 531 are intended primarily for seniors and M. Eng. students; however, incoming M.S. or Ph.D. students who will not major in fluid mechanics but need competence in problem solving and basic problem formulation should be interested also. The courses may be taken independently or as a sequence.

531 Boundary Layers

Spring. 3 credits. Prerequisite: M&AE 323 and senior or graduate standing or permission of instructor. Recommended: M&AE 530 or equivalent.

Navy-Stokes equations. Boundary layers, laminar and turbulent; skin friction, separation and transition. Jets and wakes.

536 Turbomachinery and Applications

Spring. 3 credits. Prerequisite: M&AE 323 or equivalent.

3 lecs. F. K. Moore.

Aerothermodynamic design of turbomachines in general, energy transfer between fluid and rotor in specific types, axial and radial devices, compressible flow. Three-dimensional effects, surging.

543 Combustion Processes

Spring. 3 credits.

Prerequisites: M&AE 323 and 324.

3 lecs. M. Louge.

An introduction to combustion and flame processes, with emphasis on fundamental fluid dynamics, heat and mass transport, and reaction-kinetic processes that govern combustion rates. Thermochemistry, kinetics, vessel explosions, laminar and turbulent premixed and diffusion flames, droplet combustion, combustion of solids.

554 Solar Energy

Fall. 3 credits. Prerequisite: Engr 221 or equivalent. Not offered 1986–87.

B. J. Conta.


556 Power Systems

Fall. 3 credits. Prerequisite: M&AE 323 or equivalent.

A broad survey of methods of large-scale power generation, emphasizing energy sources, thermodynamic cycle considerations, and component description. Power-industry, economic, and environmental factors. Trends and projections.

559 Introduction to Controlled Fusion: Principles and Technology (also EE 484 and NS&E 484)

Spring. 3 credits.

Prerequisites: Physics 112, 213, and 214, or equivalent background in electricity and magnetism and mechanics with permission of instructor. Intended for seniors and graduate students.


For description see NS&E 484.

601 Foundations of Fluid Dynamics and Aerodynamics

Fall. 4 credits. Prerequisite: graduate standing or permission of instructor.

S. B. Pope.

Foundations of fluid mechanics from an advanced viewpoint. Aspects of kinetic theory as it applies to the formulation of continuum fluid dynamics. Surface phenomena and boundary conditions at interfaces. Fundamental kinematic descriptions of fluid flow, tensor analysis, derivation of the Navier-Stokes equations and energy equation for compressible fluids. Viscous flows, boundary layers, potential flows, vorticity dynamics.

602 Incompressible Aerodynamics

Spring.

4 credits. Prerequisite: M&AE 601 or equivalent. Open to qualified undergraduates with permission of instructor.

J. L. Lumley.


603 Compressible Aerodynamics

Spring.

4 credits. Prerequisite: M&AE 601 or equivalent. Open to qualified undergraduates with permission of instructor.

S. F. Shen.

608 Physics of Fluids I  Fall. 4 credits. Prerequisite: Graduate standing or permission of instructor.  
P. L. Auer  

609 Physics of Fluids II  Spring, on demand. 4 credits.  

630 Atmospheric Turbulence and Micrometeorology  Spring. 4 credits. Open to qualified undergraduates with permission of instructor. Offered alternate years.  
Z. Warhaft  
Basic problems associated with our understanding of the structure of the velocity field and the transport of scalars such as temperature and moisture in the lower atmosphere, from both theoretical and experimental viewpoints. Topics include the second-order turbulence equations and their closure; Monin-Obukhov theory; diffusion of scalars; spectral characteristics of atmospheric variables; experimental techniques, including remote sensing; and the analysis of random-time series.

648 Seminar on Combustion  Fall 2 or 4 credits. Prerequisite: permission of instructor. Offered alternate years. Not offered 1986–87  
S. B. Pope, C. T. Avedisian  
Discussion of contemporary problems in combustion research, with emphasis on applications of modern experimental and analytical techniques. Typical problems have included formation and removal of pollutants in combustion systems, combustion of alternative fuels, coal combustion, combustion in turbulent flow, and droplet combustion.

651 Advanced Heat Transfer  Fall 4 credits. Prerequisite: graduate standing or permission of instructor.  

652 Thermodynamics and Phase-Change Heat Transfer  (also Chem E 721)  Fall. 4 credits.  
Prerequisite: graduate standing or permission of instructor.  
C. T. Avedisian  

653 Experimental Methods in Fluid Mechanics, Heat Transfer, and Combustion  Fall. 4 credits.  
2 lecs., 1 lab.  
Study of experimental techniques for measuring pressure, temperature, velocity, and composition of gases, with emphasis on experimental capabilities and physical principles. Topics include laser velocimetry, hot-wire anemometry, spectroscopy, and laser scattering.

704 Viscous Flows  Fall, on demand. 4 credits. Prerequisite: M&AE 601 or permission of instructor.  
S. F. Shen  
A systematic study of laminar-flow phenomena (including compressibility and heat transfer) and methods of analysis. Exact solutions of the Navier-Stokes equations. Linearized problems; flow at small Reynolds numbers, laminar instability. The boundary-layer approximation; general properties. Transformations for compressibility and axisymmetric effects. Approximate methods of calculation. Separation and unsteady problems. Stability of laminar flows.

707 Aerodynamic Noise Theory  Offered on demand. 4 credits. Prerequisite: M&AE 601 or permission of instructor.  
S. B. Pope  

733 Stability of Fluid Flow  Spring. 4 credits. Prerequisite: graduate standing or permission of instructor. Offered alternate years.  
S. Leibovich  

734 Turbulence and Turbulent Flow  Fall. 4 credits. Prerequisite: M&AE 601 or permission of instructor.  
J. L. Lumley  
Topics include the dynamics of buoyancy and shear-driven turbulence, boundary-free and bounded shear flows, second-order modeling, the statistical description of turbulence, turbulent transport, and spectral dynamics.

736 Computational Aerodynamics  Fall. 4 credits. Prerequisites: graduate standing, an advanced course in continuum mechanics or fluid mechanics, and some FORTRAN programming experience.  
D. A. Caughey  
Numerical methods for hyperbolic partial differential equations arising in in inviscid and high-Reynolds-number fluid-flow problems. Finite difference and finite volume methods. Accuracy, convergence, and stability of explicit and implicit methods, including treatment of boundary conditions and grid generation for complex geometries. General procedures for solving the Euler equations, with a critical survey of current methods for problems of aerodynamic interest, including those which are dominantly hyperbolic (such as unsteady flows with shock waves) or are mixed elliptic-hyperbolic (such as steady transonic flows). Assigned problems are solved using a digital computer.

737 Computational Heat Transfer  Spring. 4 credits. Prerequisites: graduate standing; an advanced course in continuum mechanics, heat transfer or fluid mechanics; and some FORTRAN programming experience.  
K. E. Torrance  

Special Offerings

393 Current Topics in Biomechanics  Spring. No credit.  
D. L. Barcel.  
Lecture series open to students and community at large: lectures on a common topic, reports of current research and design projects at Cornell; career and study opportunities. Lectures by Cornell faculty, graduate students, and visiting scientists.

490 Special Investigations in Mechanical and Aerospace Engineering  Fall, spring. Credit to be arranged. Limited to undergraduate students. Prerequisite: permission of instructor. Intended for an individual student or a small group of students who want to pursue a particular analytical or experimental investigation outside of regular courses or for informal instruction supplementing that given in regular courses.

590 Mechanical Engineering Design  Spring. 4 credits. Intended for students in M.Eng (Mechanical) program. Formal consideration of the complete design process (including creativity, planning, scheduling, cost analysis, management, and analytical methods) in the context of one or more specific projects carried out by the students. Projects may arise from department research interests or industrial collaboration.

592 Seminar and Design Project in Aerospace Engineering  Fall, spring. 2 credits each term.  
Offered for students in M.Eng (Aerospace) program. Study and discussion of topics of current research interest in aerospace engineering. Individual design projects.

594 Manufacturing Engineering Seminar  (also OR&IE 894)  Fall, spring. 1 credit. S-U grades.  
A weekly meeting for Master of Engineering students. Discussion of various topics on manufacturing with faculty members and outside speakers.

690 Special Investigations in Mechanical and Aerospace Engineering  Fall, spring. Credit to be arranged. Limited to graduate students.

695 Special Topics in Mechanical and Aerospace Engineering  Fall, spring. Credit to be arranged. Prerequisite: permission of instructor. Lecture or seminar format. Topics of current importance in mechanical and aerospace engineering and research. More than one topic may be offered if demand warrants.

791 Fluid Mechanics Research Conference  Fall, spring. 1 credit each term. For graduate students involved in research projects. Presentations on research in progress by faculty and students.

S. Leibovich.
Topics selected from areas of current interest. Examples include nonlinear-wave propagation, dynamics of rotating fluids, and dynamics of concentrated vortices.)

799 Mechanical and Aerospace Engineering Colloquium Fall, spring. 1 credit each term. Credit limited to graduate students. All students and staff invited to attend. Lectures by visiting scientists and Cornell faculty and staff members on research topics of current interest in mechanical and aerospace science, especially in connection with new research.

890 Research in Mechanical and Aerospace Engineering Credit to be arranged. Prerequisite: candidacy for M.S. degree in mechanical or aerospace engineering or approval of director. Independent research in an area of mechanical and aerospace engineering under the guidance of a member of the faculty.

990 Research in Mechanical and Aerospace Engineering Credit to be arranged. Prerequisite: candidacy for Ph.D. degree in mechanical or aerospace engineering or approval of director. Independent research in an area of mechanical and aerospace engineering under the guidance of a member of the faculty.

Nuclear Science and Engineering

A number of courses in nuclear science and engineering are offered through the School of Applied and Engineering Physics; see AEP 609, 612, 613, 633, 634, 636, 638, 651, and 652.

121 Fission, Fusion, and Radiation (also Engr 121) Spring. 3 credits.
2 lecs. 1 lab demonstration.
For description see Engineering Common Courses.

303 Introduction to Nuclear Science and Engineering I (also A&EP 303) Fall. 3 credits. Prerequisite: Physics 214 or Mathematics 294. This course and NS&E 304 and 306 form a coordinated, two-semester sequence designed for juniors or seniors from any engineering field who want to prepare for graduate-level nuclear science and engineering courses at Cornell or elsewhere. The sequence can also serve as a basic course for those who do not intend to continue in the field. 303 is a reasonably self-contained unit that can be taken by itself by those desiring only one term.
3 lecs. V. O. Kostroun.
Introduction to the fundamentals of nuclear reactors. Topics include an overview of the field of nuclear engineering; nuclear structure, radioactivity, and reactions; interaction of radiation and matter; and neutron moderation, neutron diffusion, the steady-state chain reaction, and reactor kinetics. At the level of Introduction to Nuclear Engineering, by Lammash.

304 Introduction to Nuclear Science and Engineering II (also A&EP 304) Spring. 3 credits. Prerequisite: NS&E 303.
3 lecs. D. D. Clark.
Introduction to aspects of nuclear reactor engineering and to controlled fusion. Topics include heat-transfer and safety problems in fission reactors; principles, configurations, and engineering problems of proposed fusion reactors; radiation detection, shielding, biological effects of radiation, and materials damage.

305 Introduction to Nuclear Science and Engineering III Spring. 1 credit. Prerequisite: NS&E 304.
1 lec. D. D. Clark.
A one-hour reading and lecture course providing a more extensive development of the topics in nuclear physics introduced in NS&E 303. Recommended as a supplement to NS&E 303-304 for students who plan graduate work in nuclear science or engineering.

484 Introduction to Controlled Fusion: Principles and Technology (also EE 484 and M&AE 559) Spring. 3 credits. Prerequisite: Physics 112, 213, and 214, or equivalent background in electricity and magnetism and mechanics, with permission of instructor. Intended for seniors and graduate students.
Introduction to the physical principles and technology underlying controlled-fusion power. Topics include fundamental aspects of the physics of ionized gases at high temperature (thermonuclear plasmas), requirements (in principle) for achievement of net power from fusion, technological problems of an actual fusion reactor, and progress of the fusion program toward overcoming these problems. Both magnetic and inertial confinement fusion are discussed, and comparisons are made between fusion and fission.

Operations Research and Industrial Engineering

115 Engineering Application of Operations Research (also Engr 115) Fall, spring. 3 credits.
2 lecs. 1 lab. For description see Engineering Common Courses.

2 lecs. 1 lab.
For description see Engineering Common Courses.

260 Introductory Engineering Probability (also Engr 260) Fall, spring. 3 credits. Prerequisite: first-year calculus.
3 lecs. For description see Engineering Common Courses.

270 Basic Engineering Probability and Statistics Fall, spring. 3 credits. Prerequisite: first-year calculus.
3 lecs. Evening prelms.
For description see Engineering Common Courses.

320 Optimization I Fall. 4 credits. Prerequisite: Mathematics 294 or 221.
3 lecs. 1 rec.
Formulation of linear programming problems and solution by the simplex method. Related topics such as sensitivity analysis, duality, and network programming. Applications include such models as resource allocation and production planning.

321 Optimization II Spring. 4 credits. Prerequisite: OR&IE 320 or equivalent.
3 lecs. A variety of optimization methods, stressing extensions of linear programming and its applications but also including topics drawn from integer, dynamic, and nonlinear programming. Formulation and modeling are stressed, as well as numerous applications. The computer is used in solving typical problems.

350 Cost Accounting, Analysis, and Control Fall; spring if staffing permits. 4 credits.
3 lecs. 1 computing-disc.
Principles of accounting, financial reports; job-order and process cost systems—historical and standard costs; cost characteristics and concepts for control, analysis, and decision making.

361 Introductory Engineering Stochastic Processes I Fall, spring. 4 credits. Prerequisite: OR&IE 260 or equivalent.
3 lecs. 1 rec.
Basic concepts and techniques of random processes are used to construct models for a variety of problems of practical interest. Topics include the Poisson process, Markov chains, renewal theory, models for queuing and reliability.

370 Introduction to Statistical Theory with Engineering Applications Fall, spring. 4 credits. Prerequisite: OR&IE 260 or equivalent.
3 lecs. 1 rec.
Provides a working knowledge of basic statistics as it is most often applied in engineering and a basis in statistical theory for continued study. Topics include a review of distributions of special interest in statistics; testing simple and composite hypotheses; point and interval estimation; correlation; linear regression.

3 lecs. 1 computing session.
Engineering economic analysis, including engineering economy, replacement, taxation effects, decision making based on economic considerations. Operations analysis, including process flow, process evaluation, procedural analysis, resource layout, methods analysis and design, work measurement, job evaluation, quality control elements. Project planning and control.

2 lecs. 1 rec.
Design of the layout of processes and storage areas and the material-handling system for movement of items. Typical equipment used. The functions of identification control, storage, movement, batching, merging, and dispersion. Introduction to new technologies.

421 Production Planning and Control Fall. 4 credits. Prerequisite: OR&IE 320 and 361, or permission of instructor.
3 lecs. 1 rec.
Planning and control of large-scale production operations. Inventory control. Leveling, smoothing, and scheduling of production. Job-shop scheduling and dispatching. Demand forecasting. Economic and practical interpretation of planning and control procedures.

431 Discrete Models Spring. 4 credits. Prerequisite: OR&IE 320 or permission of instructor.
3 lecs. 1 rec.
Basic concepts of graphs, networks, and discrete optimization. The use of finite mathematical techniques to model contemporary problems selected from operations research, including voting procedures and decision making, efficient and equitable allocations, energy and environment, traffic and urban systems.

435 Introduction to Game Theory Fall. 3 credits.
A broad survey of the mathematical theory of games, including such topics as two-person matrix and bimatrix games; cooperative and noncooperative n-person games; games in extensive, normal, and characteristic function form. Economic market games. Applications to weighted voting and cost allocation.

451 Economic Analysis of Engineering Systems Spring. 4 credits. Prerequisites: OR&IE 290 and OR&IE 350.
3 lecs. 1 computing session.
Financial planning, including cash-flow analysis and return on equity models. Engineering economic analysis including discounted cash flows and taxation effects. Application of optimization techniques, including capacity expansion models. Issues in designing manufacturing systems. Case studies in designing an international distribution system and designing an automated factory. Student group project.

[462 Introductory Engineering Stochastic Processes II Fall. 4 credits. Prerequisite: OR&IE 361 or equivalent. Not offered 1986–87.
3 lecs. 1 rec.
A selection of topics from the following: martingales, Markov and semi-Markov processes, optimal stopping. Examples and applications are drawn from several areas.]
471 Applications of Statistics to Engineering Problems Fall. 4 credits. Prerequisite: OR&E 370 or equivalent.
3 lecs, 1 rec.
Theory of multiple linear regression and its application to problems in engineering and the sciences, including graphic and analytic techniques useful in model building; analysis of data from experiments with qualitative factors, including one-way and two-way ANOVA models. Use of the computer as a tool for statistics is stressed.

472 Statistical Decision Theory Spring. 3 credits. Prerequisite: OR&E 370 or equivalent.
3 lecs.

499 OR&E Project Fall, spring. Credit to be arranged. Prerequisite: permission of instructor.
Project-type work, under faculty supervision, on a real problem existing within some firm or institution, usually a regional organization. Opportunities in the course may be discussed with the associate director.

516 Case Studies Fall. 4 credits. Only for M.Eng. students in OR&E.
3 rec-labs.
Students are presented with unstructured problems that resemble real-world situations. Students work in project groups on the formation of mathematical models, computer analysis of the data and models, and presentation of oral and written reports.

520 Operations Research I: Optimization I Fall. 4 credits. Prerequisite: Mathematics 294 or 221.
Intended for graduate students minoring in operations research. Lectures concurrent with OR&E 330.
3 lecs, 1 rec.
Formulation of linear programming problems and solution by the simplex method. Related topics such as sensitivity analysis, duality and network programming. Applications include such models as resource allocation and production planning.

521 Optimization II Spring. 4 credits. Prerequisite: OR&E 300 or 520 or equivalent.
Intended for graduate students in other fields. Lectures concurrent with OR&E 321.
3 lecs, 1 rec.
A variety of optimization methods, stressing extensions of linear programming and its applications but also including topics drawn from integer, dynamic, and nonlinear programming. Formulation and modeling are stressed, as well as numerous applications. The computer is used in solving typical problems.

523 Operations Research II: Introduction to Stochastic Modeling Spring. 4 credits. Prerequisite: OR&E 260 or equivalent.
Intended for graduate students in other fields. Lectures concurrent with OR&E 361.
3 lecs, 1 rec.
Basic concepts and techniques of random processes are used to construct models for a variety of problems of practical interest. Topics include the Poisson process, Markov chains, renewal theory, models for queuing and reliability.

561 Queuing Theory and Its Applications Fall. 3 credits. Prerequisite: OR&E 361 or permission of instructor.
3 lecs.
Basic queuing models. Delay and loss systems. Finite source, finite capacity, bypassing, rerouting. Systems in series and in parallel. Various queue disciplines. Busy-

562 Inventory Theory Spring. 4 credits. Prerequisite: OR&E 421 or permission of instructor.
3 lecs, 1 rec.
Discussion of the nature of inventory systems and their design and control. Periodic and continuous review policies for single-item and single-location problems. Multi-item and multi-echelon extensions. Dynamic and static models are discussed. Distribution problems are analyzed. Applications are stressed.

563 Applied Time Series Analysis Spring 3 credits. Prerequisite: OR&E 361 and 370 and CS 211, or permission of instructor.
2 lecs, 1 rec, final project.
Box-Jenkins models, which are versatile, widely used, and applicable to nonstationary and seasonal time series, are covered in detail. The various stages of model identification, estimation, diagnostic checking, and forecasting are treated. Long-range dependence models and the related stationarity tests are considered. As time permits other topics such as spectral analysis, filtering, the sampling and aliasing problem, and the fast Fourier transform algorithm are discussed. Applications to economics and hydrology are emphasized. Assignments require computer work.

570 Statistical Methods in Quality and Reliability Control Spring. 3 credits. Prerequisite: OR&E 370 or equivalent.
3 lecs.
Control concepts and methods for attributes and variables; process capability analysis; acceptance sampling plans; elementary procedures for variables; acceptance-rectification procedures. Reliability concepts; exponential and normal distributions in reliability; life and reliability analysis of components and systems; redundancy.

580 Digital Systems Simulation Fall. 4 credits. Prerequisites: CS 211 and OR&E 370, or permission of instructor.
2 lecs, 1 rec.
Digital computer programs to simulate the operation of complex discrete systems in time. Modeling, program organization, pseudorandom number generation, simulation languages, statistical considerations; applications to a variety of problem areas.

599 Project Fall, spring, 5 credits. For M.Eng. students.
Identification, analysis, design, and evaluation of feasible solutions to some applied problem within the OR&E field. A formal report and oral defense of the approach and solution are required.

625 Scheduling Theory Spring. 3 credits. Prerequisite: permission of instructor. Not offered 1986–87.
3 lec-recs.
Scheduling and sequencing problems. Single-resource scheduling, parallel processing, flow-shop scheduling. Methodology is drawn from dynamic and integer programming, simulation techniques and heuristic methods.

626 Advanced Production and Inventory Planning Fall. 3 credits. Not offered 1986–87.
3 lecs.
Introduction to a variety of production and distribution planning problems; the development of mathematical models corresponding to these problems; a study of approaches for finding solutions.

630–631 Mathematical Programming I and II Fall. 630, fall. 631, spring. 3 credits each term. Prerequisite: advanced calculus.
3 lecs.

632 Nonlinear Programming Fall. 3 credits. Prerequisite: OR&E 630. Not offered 1986–87.
3 lecs.
Necessary and sufficient conditions for unconstrained and constrained optimas. Duality theory. Computational methods for unconstrained (e.g., quasi-Newton) problems, linearly constrained (e.g., active set) problems, and nonlinearly constrained (e.g., successive quadratic programming) problems.

633 Graph Theory and Network Flows Spring. 3 credits. Prerequisite: permission of instructor.
3 lecs.

634 Combinatorial Optimization Fall. 3 credits. Prerequisite: permission of instructor. Not offered 1986–87.
3 lecs.
Topics in combinatorics, graphs, and networks. These include matching, matroids, polyhedral combinonics, and optimization algorithms.

636 Integer Programming Fall. 3 credits. Prerequisite: OR&E 630.
3 lecs.
Discrete optimization. Linear programming in which the values are restricted to integers. Theory, algorithms, and applications. Cutting-plane methods, enumerative methods, and group-theoretic methods; additional topics are drawn from recent research in this area.

637 Dynamic Programming Fall. 3 credits. Prerequisite: permission of instructor.
3 lecs.
Optimization of sequential decision processes. Deterministic and stochastic models, infinite-horizon Markov decision models, dynamic programming; additional topics such as Markov decision processes. Applications; algorithms and computer programs; applications to inventory problems, production control; discrete combination examples.

639 Convex Analysis Fall. 3 credits. Prerequisite: Mathematics 411 and 431, or permission of instructor.
3 lecs.
The theory of finite dimensional convex sets is developed through the study of real-valued convex functions and Fenchel duality. Separation of convex sets, polarity correspondences, recession cones, theorems of Helly and Caratheodory.

645 Game Theory I Spring. 3 credits. Prerequisite: Mathematics 411 or 431, or permission of instructor.
3 lecs.
Noncooperative n-person games; Nash equilibrium points. Cooperative n-person games, the core, stable sets, Shapley value, bargaining set, kernel, nucleolus. Selected applications.

646 Game Theory II Fall. 3 credits. Prerequisite: OR&E 645.
3 lecs.
A continuation of OR&E 645, including in-depth treatment of some of the same topics plus such additional topics as games in extensive form, games without side payments, economic market games, and games with infinitely many players.
[652] Advanced Inventory Control  Fall. 3 credits. Prerequisite: permission of instructor. Not offered 1986–87.
3 lecs.
The theoretical foundation of inventory theory. Both single-item, single-location problems and multi-item, multi-echelon inventory systems are analyzed. Topics covered include a study of static and dynamic (S,S) policies under a variety of assumptions concerning the demand process and system structure, as well as computational techniques.

660  Applied Probability  Fall. 4 credits. Prerequisite: advanced calculus.
3 lecs. 1 rec.

661  Applied Stochastic Processes  Spring. 4 credits. Prerequisite: OR&IE 660 or equivalent.
3 lecs. 1 rec.
An introduction to stochastic processes that presents the basic theory together with a variety of applications. Topics include Markov processes, renewal theory, random walks, branching processes, Brownian motion, stationary processes, martingales.

662  Advanced Stochastic Processes  Fall. 3 credits. Prerequisite: OR&IE 661 or equivalent.
3 lecs.
A selection of topics from the following: stationary processes, Levy processes, diffusion processes, point processes, martingales, regenerative phenomena, stochastic calculus, weak convergence.

663  Time Series Analysis  Spring. 3 credits. Prerequisite: OR&IE 660 or equivalent. Not offered 1986–87.
3 lecs.

664  Deterministic and Stochastic Control  Spring. 3 credits. Prerequisite: OR&IE 661 or equivalent. Not offered 1986–87.
3 lecs.
Topics include elements of calculus of variations. Pontryagin's maximum principle. Markov decision processes, dynamic programming. Problems in filtering and prediction, production planning and inventory control, congestion phenomena, storage models, and environmental management are discussed.

665  Advanced Queuing Theory  Fall. 3 credits. Prerequisite: OR&IE 660 or equivalent. Not offered 1986–87.
3 lecs.
A study of stochastic processes arising in a class of problems including congestion, storage, dams, and insurance. The treatment is self-contained. Transient behavior of the processes is emphasized. Heavy-traffic situations are investigated.

670  Applied Statistics  Spring. 4 credits. Prerequisite: OR&IE 660 or equivalent.
3 lecs. 1 rec.
Review of distribution theory of special interest in statistics: normal, chi-square, binomial, Poisson, t, and F; introduction to statistical decision theory; sufficient statistics; theory of minimum variance unbiased point estimation; maximum likelihood and Bayes estimation; basic principles of hypothesis testing, including Neyman-Pearson Lemma and likelihood ratio principle; confidence interval construction; introduction to linear models.

671  Intermediate Applied Statistics  Fall. 3 credits. Prerequisite: OR&IE 670 or equivalent.
3 lecs.
Statistical inference based on the general linear model: least-squares estimators and their optimality properties; likelihood ratio tests and corresponding confidence regions; simultaneous inference. Applications in regression analysis and ANOVA models. Variance components and mixed models. Use of the computer as a tool for statistics is stressed.

672  Statistical Decision Theory  Fall. 3 credits. Prerequisite: OR&IE 471 or 670 or equivalent. Not offered 1986–87.
3 lecs.

673  Nonparametric Statistical Analysis  Fall. 3 credits. Prerequisite: OR&IE 670 or permission of instructor.
3 lecs.

674  Design of Experiments  Spring. 3 credits. Prerequisite: OR&IE 671 or permission of instructor.
3 lecs.
Use and analysis of experimental designs such as randomized blocks, balanced incomplete blocks, and Latin squares; analysis of variance and covariance, factorial experiments; statistical problems associated with finding best operating conditions; response-surface analysis.

675  Qualitative Data Analysis  Spring. 3 credits. Prerequisite: OR&IE 671.
3 lecs.
Varieties of categorical data; cross classifications and contingency tables; simultaneous estimation of parameters; tests for independence; multidimensional tables and log-linear models; maximum likelihood and weighted least-squares estimation; tests of goodness of fit; analysis of incomplete tables; paired comparison experiments.

676  Statistical Analysis of Life Data  Fall. 3 credits. Prerequisite: OR&IE 671 or equivalent. Not offered 1986–87.

677  Statistical Selection and Ranking Procedures  Spring. 3 credits. Prerequisite: OR&IE 674 or permission of instructor. Not offered 1986–87.
3 lecs.
A study of multiple-decision problems, in which a choice must be made among two or more courses of action. Major emphasis is on selection and ranking problems involving choosing the "best" category where goodness is measured in terms of a particular parameter of interest. Statistical formulations of such problems; indifference-zone, subset, and other approaches. Single-stage, two-stage, and sequential procedures. Applications. Recent developments.

680  Simulation  Spring. 3 credits. Prerequisite: permission of instructor.
3 lecs.
An advanced version of OR&IE 580, intended for Ph.D.-level students.

728–729  Selected Topics in Applied Operations Research  Fall, spring. Credit to be arranged.
Current research topics dealing with applications of operations research.

738–739  Selected Topics in Mathematical Programming  Fall, spring. Credit to be arranged.
Current research topics in mathematical programming.

748–749  Selected Topics in Game Theory  Fall, spring. Credit to be arranged. Not offered 1986–87.
Current research topics in game theory.

766–769  Selected Topics in Applied Probability  Fall, spring. Credit to be arranged.
Topics are chosen from current literature and research areas of the staff.

778–779  Selected Topics in Applied Statistics  Fall, spring. Credit to be arranged.
Topics chosen from current literature and research of the staff.

790  Special Investigations  Fall, spring. Credit to be arranged.
For individuals or small groups. Study of special topics or problems.

799  Thesis Research  Fall, spring. Credit to be arranged.
For individuals doing thesis research for master's or doctoral degrees.

891  Operations Research Graduate Colloquium  Fall, spring. 1 credit.
A weekly 1 1/2-hour meeting devoted to presentations by distinguished visitors, by faculty members, and by advanced graduate students on topics of current research in the field of operations research.

893–894  Applied OR&IE Colloquium (894 also M&AE 594) 893. Fall; 894, spring. 1 credit each term.
A weekly meeting for Master of Engineering students. Discussion of various topics on manufacturing with faculty members and outside speakers.

Theoretical and Applied Mechanics

Basics in Engineering Mathematics and Mechanics

202  Mechanics of Solids (also Engr 202)  Fall, spring. 3 credits. Prerequisite: coregistration in Mathematics 293.
2 lecs. 1 rec. 4 labs each semester, evening exams. For description see Engineering Common Courses.

203  Dynamics (also Engr 203)  Fall, spring. 3 credits. Prerequisites: coregistration in Mathematics 294.
2 lecs. 1 rec. 4 labs each semester, evening exams. For description see Engineering Common Courses.

293  Engineering Mathematics with Microcomputers (also Mathematics 293)  Fall, spring. 4 credits. Prerequisites: Mathematics 192 or 194.
2 lecs. 1 rec. 4 labs during semester, evening exams (See Mathematics 293).
Partial derivatives and multiple integrals; first- and second-order ordinary differential equations with applications in the physical and engineering sciences. Includes microcomputer experiments using computer algebra to solve problems.

294  Engineering Mathematics with Microcomputers (also Mathematics 294)  Fall. 4 credits. Prerequisite: Mathematics 294.
2 lecs. 1 rec. 4 labs during semester, evening exams (See Mathematics 293).
Vectors and matrices, linear algebra, matrices, eigenvalue problems, and applications to systems of linear
616 Methods of Applied Mathematics IVb

An introduction to MACSYMA, a computer programming system that permits the exact algebraic manipulation of expressions involving polynomials and trigonometric functions, with applications to engineering analysis. The system includes symbolic differentiation and integration as well as symbolic matrix inversion. Applications will include Lagrange's and Hamilton's equations of motion, Taylor and Fourier Series solutions of differential equations, and perturbation methods for systems with a small parameter.

Experimental Mechanics

[589 Sensors Fall. 3 credits. Not offered 1986–87. This course deals with the general properties of sensors used in measurement and process-control applications involving thermal and mechanical quantities. Studied are transducer models representing the operation of sensors based on a broad range of physical transduction phenomena. Attention is also given to signal-processing algorithms for processing sensor signals in a variety of measurement and characterization applications.]

[640 Experimental Mechanics Fall. 3 credits. Not offered 1986–87. This course introduces students to the principles of measurement and experimentation in mechanics, acquaints them with some of the techniques for measuring fundamental mechanical quantities, and permits them to explore experimental topics such as the elastic, viscoelastic, and plastic response of materials; the linear and nonlinear vibration of discrete and continuous systems, and acoustic and elastic wave propagation and scattering phenomena.]

Continuum Mechanics and Inelasticity

551 Principles and Applications of Solid Mechanics Fall. 3 credits. Prerequisite: T&M 610 or equivalent. Introduction to stress, strain, momentum balance, energy principles, balance laws, and selected topics in classical elasticity. Mechanics of plates and shells, including analytical and numerical methods. Foundation for advanced courses in elasticity, plasticity, fracture, and elastic waves.

555 Composite Materials (also M&E 615 and MS&E 615) Spring. 4 credits. Prerequisites: Engr 202 and 261 or graduate standing or permission of instructor. Brief history of composite materials, types, geometries, fiber types, and structures; polymer matrices and deformation properties; orthotropic elasticity; stress-strain analysis of lamina and laminates; micromechanics of deformation and stress transfer, effective moduli, theories of strength and fatigue, nondestructive testing and inspection, applications of composites, environmental effects.

664 Theory of Elasticity Spring. 3 credits. Not offered 1986–87. This course is taught jointly by faculty members from T&M and CEE. Its aim is to survey a wide range of applications of the BEM in solid and fluid mechanics. Some of the topics to be covered will be torsion of shafts, groundwater flow, wave propagation in solids and liquids, diffusion, bending of plates, and linear elasticity. Problems involving nonhomogeneous media, as well as nonlinear problems like plastic or viscoelastic deformation, large-strain, large-rotation, etc., will be discussed if time permits. The emphasis in the course will be on computer applications.

Elasticity and Waves

574 Mechanical Vibrations and Waves Spring. 3 credits. Two 1-½-hour lectures, 4 labs each semester. Review of vibrations of discrete systems, including multi-degree-of-freedom vibrations. Unified treatment of vibrations and wave phenomena in continuous elastic systems, including strings, rods, beams, membranes, and plates. Approximate methods for finding natural modes and frequencies. Dispersion and group velocity. Transient response of discrete and continuous systems.

666 Fundamentals of Acoustics (also EE 449) Spring. 3 credits. 3 lectures, biweekly labs. Analysis of stress and strain. Airy's stress function solution using Fourier series and integrals. Torsion theory. Three-dimensional solutions. Bending of prismatic bars. Axially loaded circular cylinder and half space. All topics are illustrated by engineering applications.

752 Advanced Subjects in Continuum Mechanics of Current Interest Spring. 3 credits. Prerequisite: T&M 651. Offered alternate years. Polymer rheology using functional or state variables. Continuum theory for rapid shear flows of granular materials. Chemically driven convection, and infinite deformation in biological poro-elastic solids.


[759 Boundary-Element Methods in Solid and Fluid Mechanics (also CEE 639) Spring. 3 credits. Prerequisites: T&M 610 or 611 or equivalent. Offered alternate years. Not offered 1986–87. This course is taught jointly by faculty members from T&M and CEE. Its aim is to survey a wide range of applications of the BEM in solid and fluid mechanics. Some of the topics to be covered will be torsion of shafts, groundwater flow, wave propagation in solids and liquids, diffusion, bending of plates, and linear elasticity. Problems involving nonhomogeneous media, as well as nonlinear problems like plastic or viscoelastic deformation, large-strain, large-rotation, etc., will be discussed if time permits. The emphasis in the course will be on computer applications.]
Theories of thin structural members and their relationship to the three-dimensional theory. Introduction to static bifurcation theory with applications to strings, rods, plates, and shells.

768 Elastic Waves in Solids
Fall. 3 credits. Offered alternate years.

Dynamics and Space Mechanics

570 Intermediate Dynamics
Fall. 3 credits. Offered alternate years.
Two 1 1/4-hour lecs.
Vector and matrix methods for kinematics, Lagrangian and Newtonian mechanics for particles and rigid bodies, Euler's equations for rotating bodies, centrifugal force motion. Small vibrations and stability. Application to robotics, gyroscopes, orbital and spacecraft dynamics.

671 Advanced Dynamics
Spring. 3 credits.
Prerequisite: 7A&M 570 or equivalent. Offered alternate years.
Review of Lagrangian mechanics; Hamilton's principle, the principle of least action, and related topics from the calculus of variations; Hamilton's canonical equations; approximate methods for two-degrees-of-freedom systems (Lie transforms); canonical transformations and Hamilton-Jacobi theory. This course will use computer algebra (MACSYMA). No prior experience will be assumed.

672 Celestial Mechanics (also Astronomy 579)
Spring. 3 credits. Offered alternate years.
Two 1 1/4-hour lecs.
Description of orbits: 2-body, 3-body, and n-body problems; Hill curves, libration points and their stability; capture problems; virial theorem. Osculating elements, perturbation equations; effects of gravitational potentials, atmospheric drag, and solar radiation forces on satellite orbits; secular perturbations, resonances, mechanics of planetary rings.

673 Mechanics of the Solar System (also Astronomy 571)
Fall. 3 credits. Prerequisite: an undergraduate course in dynamics. Offered alternate years. Not offered 1986–87.
Two 1 1/4-hour lecs.

675 Nonlinear Vibrations
Fall. 3 credits.
Prerequisite: 7A&M 574 or equivalent. Offered alternate years. Not offered 1986–87.

776 Qualitative Theory of Dynamical Systems

Special Courses, Projects, and Thesis Research

491–492 Project in Engineering Science
Fall, 491; spring, 492; 1 to 4 credits, as arranged. Projects for undergraduates under the guidance of a faculty member.

796–800 Topics in Theoretical and Applied Mechanics
Fall, spring, 1–3 credits, as arranged. Special lectures or seminars on subjects of current interest. Topics are announced when the course is offered.

890 Master's Degree Research in Theoretical and Applied Mechanics
Fall, spring, 1–6 credits, as arranged. S-U grades optional. Thesis or independent research at the M.S. level on a subject of theoretical and applied mechanics. Research is under the guidance of a faculty member.

990 Doctoral Research in Theoretical and Applied Mechanics
Fall, spring, 1–9 credits, as arranged. S-U grades optional. Thesis or independent research at the Ph.D. level on a subject of theoretical and applied mechanics. Research is under the guidance of a faculty member.

Faculty Roster

Abel, John F., Ph.D., U. of California at Berkeley, Prof., Civil and Environmental Engineering
Albert, Louis D., Ph.D., Cornell U. Assoc. Prof., Agricultural Engineering
Almendinger, Richard P., Stanford U. Asst. Prof., Geological Sciences
Anandharam, Venugopal, Ph.D., U. of California at Berkeley Asst. Prof., Electrical Engineering
Anton, A. Brad, P. D., California Inst. of Technology Asst. Prof., Mechanical Engineering
Asimov, Edward, Ph.D., University of California at Berkeley, Asst. Prof., Computer Science
Asimov, Edward, Ph.D., University of California at Berkeley, Asst. Prof., Computer Science
Auer, Peter L., Ph.D., California Inst. of Technology Prof., Mechanical and Aerospace Engineering
Awdisian, C. Thomas, Ph.D., Princeton U. Assoc. Prof., Mechanical and Aerospace Engineering
Bagdoli, Ozain, Ph.D., U. of California at Berkeley, Asst. Prof., Computer Science
Bar, Donald L., Ph.D., U of Iowa, Prof., Mechanical and Aerospace Engineering
Bartsch, James A., Ph.D., Purdue U. Asst. Prof., Agricultural Engineering
Basset, William A., Ph.D., Columbia U. Adjunct Prof., Geological Sciences
Bartley, Boris W., Ph.D., Massachusetts Inst. of Technology Prof., Applied and Engineering Physics
Becchhoefer, Robert E., Ph.D., Columbia U. Prof., Operations Research and Industrial Engineering
Berger, Toby, Ph.D., Harvard U. Prof., Electrical Engineering
Biller, Giannfranco, Ph.D., U. of Illinois, Asst. Prof., Computer Science
Biller, Louis J., Ph.D., City U. of New York, Prof., Operations Research and Industrial Engineering
Bird, John M., Ph.D., Rensselaer Polytechnic Inst. Prof., Geological Sciences
Birman, Kenneth P., Ph.D., U. of California at Berkeley, Asst. Prof., Computer Science
Blais, James J., Ph.D., Cornell U. Assoc. Prof., Civil and Environmental Engineering
Bilton, Dina, Ph.D., U. of Wisconsin at Madison, Asst. Prof., Computer Science
Bland, Gregory D., Ph.D., Cornell U. Assoc. Prof., Operations Research and Industrial Engineering
Bloom, Arthur L., Ph.D., Yale U. Prof., Geological Sciences
Bolgiano, Ralph, Jr., Ph.D., Cornell U. Prof., Electrical Engineering
Booher, John F., Ph.D., Cornell U. Prof., Mechanical and Aerospace Engineering
Brown, Larry D., Ph.D., Cornell U. Assoc. Prof., Geological Sciences
Bruchta, Wilfried H., Ph.D., U. of California at Davis, Prof., Civil and Environmental Engineering
Buchanan, Robert A., Ph.D., Johns Hopkins U. Prof., Applied and Engineering Physics
Burns, Joseph A., Ph.D., Cornell U. Prof., Theoretical and Applied Mechanics
Cady, K. Bingham, Ph.D., Massachusetts Inst. of Technology Prof., Nuclear Science and Engineering
Caprana, Robert R., Ph.D., Massachusetts Institute of Technology Prof., Electrical Engineering
Carlin, Herbert J., D.E.E., Polytechnic Inst. of Brooklyn, Prof., Mechanical Engineering
Carte, C. Barry, Ph.D., Oxford U. (England), Assoc. Prof., Materials Science and Engineering
Caughey, David A., Ph.D., Princeton U. Prof., Mechanical and Aerospace Engineering
Cise, John L., Ph.D., U. of Chicago, Prof., Geological Sciences
Clancy, Paul E., Ph.D., Oxford U. (England), Asst. Prof., Chemical Engineering
Clark, David D., Ph.D., U. of California at Berkeley, Prof., Nuclear Science and Engineering
Clark, Douglas S., Ph.D., Cornell U. Inst. of Technology, Asst. Prof., Chemical Engineering
Coen, Claude, Ph.D., Princeton U. Assoc. Prof., Chemical Engineering
Colman, Thomas F., Ph.D., U. of Waterloo, Asst. Prof., Computer Science
Constable, Robert L., Ph.D., U. of Wisconsin, Prof., Computer Science
Cook, William J., Ph.D., U. of Waterloo (Canada), Asst. Prof., Operations Research and Industrial Engineering
Cooke, J. Robert, Ph.D., North Carolina State U. Prof., Agricultural Engineering
Cool, Terrell A., Ph.D., California Inst. of Technology, Prof., Applied and Engineering Physics
Danov, G., Dr., Technische Hochschule, Munich (Germany), Assoc. Prof., Computer Science
Dawson, Paul M., Ph.D., Colorado State U. Assoc. Prof., Mechanical and Aerospace Engineering
deBoer, P. Tobias, Ph.D., U. of Maryland, Prof., Mechanical and Aerospace Engineering
Delscamp, David F., Ph.D., Harvard U. Asst. Prof., Electrical Engineering
Dix, Richard L., Ph.D., U. of Illinois, Illinois Inst. Professor of Engineering, Civil and Environmental Engineering
Eastman, Lester F., Ph.D., Cornell U. Prof., Electrical Engineering
Faulk, Donald T., Ph.D., Cornell U. Prof., Electrical Engineering
Finn, Robert K., Ph.D., U. of Minnesota, Prof., Chemical Engineering
Fisher, Gordon P., Dr., Johns Hopkins U. Prof., Civil and Environmental Engineering
Fleischmann, Hans H., Ph.D., Technische Hochschule, Munich (Germany), Prof., Applied and Engineering Physics

Specialists in theoretical and applied mechanics.
Graduate School

Administration

Alison P. Casarett, dean
Joycelyn R. Hart, assistant dean
Kenneth A. Strike, secretary of the graduate faculty

Graduate study at Cornell is pursued through the Graduate School, which administers the many graduate fields of study, or through the various graduate professional schools and colleges.

Programs leading to the degrees of Doctor of Law (J.D.), Doctor of Medicine (M.D.), Doctor of Veterinary Medicine (D.V.M.), and Master of Business Administration (M.B.A.) are not administered by the Graduate School. Information on those programs can be obtained from the Law School, the Medical College (New York City), the College of Veterinary Medicine, and the Johnson Graduate School of Management, respectively.

Graduate School

The graduate program at Cornell permits an unusual degree of accommodation to the needs and interests of the individual student. Degree requirements are kept to a minimum. There are no specific course or credit requirements for the advanced general degrees of Master of Arts, Master of Science, and Doctor of Philosophy, but only such general requirements that best accomplish the aim of graduate study: a period of study in residence, the mastery of one subject, adequate knowledge of allied subjects, oral examinations to establish competency for presentation of a thesis, and a satisfactory thesis. Certain advanced professional degree programs have specific course or credit requirements, which are determined by the faculty of the professional school or college in which the degrees are offered.

A close working relationship with faculty members is essential to the graduate program at Cornell. Under the Special Committee system, the student is guided by, and works with, at least two or three faculty members chosen by the student to represent his or her major and minor subjects. The major subject representative is the chairperson of the Special Committee and usually has the primary responsibility for directing the student's thesis research.

Students who want to use the University's facilities for intensive specialized training only and who do not want to become degree candidates may apply for admission as non-degree candidates.

Requirements for Admission

To be admitted to the Graduate School, an applicant should:

1. hold a baccalaureate degree or its equivalent, granted by a faculty or university of recognized standing;
2. have adequate preparation for graduate study in the chosen field of instruction;
3. have fluent command of the English language;
4. present evidence of promise in advanced study and research; and
5. have a combined score of at least 1200 in the verbal and quantitative Aptitude Tests of the Graduate Record Examinations for those fields that require the GREs.

Before admission can be final, all applicants whose native language is not English must provide proof of competency in the English language. Acceptable proof could be

1. a Test of English as a Foreign Language (TOEFL) score of 550 or higher;
2. a degree from a college or university in a country where the native language is English; or
3. two or more years of study in an undergraduate or graduate program in a country where the native language is English.

Information on times and places for the TOEFL examination and Graduate Record Examinations and application forms may be obtained from the Educational Testing Service, Princeton, New Jersey 08540, U.S.A.

Applications for admission to the Graduate School may be submitted at any time during the year. Many fields, however, require that applicants for fall admission submit their completed applications by January 15.

Applicants who are also applying for Cornell Graduate School fellowship consideration must submit their completed applications and supporting credentials by January 15.

Inquiries regarding admission and fellowships should be addressed to the Graduate School Admissions Office, Cornell University, Sage Graduate Center, Ithaca, New York 14853-6201.

Information concerning admission requirements and courses of study for degrees not administered by the Graduate School may be obtained from the several schools and colleges that administer them (see "Administration," above).

Inquiries regarding facilities for advanced study and research in a given field, special requirements for such study and research, and opportunities for teaching and research assistantships should be addressed to the graduate faculty representative in the particular field.

Graduate students will find more thorough information in the Announcement of the Graduate School and in Graduate Study at Cornell University. Both publications are available from the Graduate School, Cornell University, Sage Graduate Center, Ithaca, New York 14853-6201.
School of Hotel Administration

Administration

John J. Clark, Jr., dean
David C. Dunn, assistant dean for academic affairs
Allan A. Lentini, director of business and administration
Michael H. Redlin, graduate faculty representative
Melinda Codd, director of the M.P.S. program
Cheryl S. Farrell, director of admissions and financial aid
Harry R. Keller, director of alumni affairs
Fred Antil, director of placement and corporate relations
Joan S. Livingston, executive editor, The Cornell Hotel and Restaurant Administration Quarterly
Mary K. Milks, registrar
Margaret J. Oakford, librarian
Maureen McKenna, external-programs director
Fred L. Conner, director of publication services
Suzanne Broderick, computer administrator
Shelley Semmier, director of development

Facilities

Statler Hall is a unique educational building designed expressly to meet the needs of the faculty and students of the School of Hotel Administration. The building has three parts: a classroom section, a full-service practice inn, and an auditorium with complete stage facilities. This provides the school with classrooms, lecture rooms, laboratories, a video and computer center, auditoriums, and spaces for instruction and research in hotel administration. The Howard B. Meek Library provides an extensive collection of publications on hotel and restaurant operation and related subjects. The library has received many gifts of display materials and personal collections—among them the Herndon and Veiling collections.

Statler Inn, the school’s practice-management facility, contains fifty-one guest rooms; a cocktail lounge; and a variety of restaurants, including a formal dining room, private dining rooms, two self-service restaurants, and a snack bar. To ensure that the inn’s facilities continue to provide a realistic laboratory for the instruction of students in the operational procedures and managerial responsibilities of the hospitality industry, they will be extensively renovated during 1986–88. The school offers its students both theoretical and practical instruction through the use of Statler Inn.

Built in 1984, the Binneklo Video and Computer Center facilitates student training in computing and provides access to video equipment. More than seventy computers and approximately 150 software packages are available. The center is open fourteen hours a day, seven days a week, to students desiring hands-on, self-paced training or practice with computers or use of advanced video equipment.

In addition to providing computer and video facilities, the center has been designated the permanent home of donors Aaron and Marion Binneklo’s extensive library of worldwide-travel films. Some of these films have won awards and have been broadcast on syndicated travel programs.

Curriculum

The School of Hotel Administration offers training in the numerous disciplines required for modern management, including accounting, finance, marketing, operations, communication, properties management, MIS/computers, law, and human-resources management. The school’s graduates hold executive positions in a variety of industries but are especially well represented in the management of hospitality-related enterprises, including the lodging, food-service, and travel industries.

Students are encouraged to pursue a broad range of courses, including those in the humanities, as preparation for assuming positions in the business community. Included in the basic curriculum are courses in financial management, food and beverage operations, administration, and physical-plant management.

To satisfy degree requirements, every undergraduate enrolled in the School of Hotel Administration must complete a minimum of two summer periods of ten weeks each or their equivalent of full-time, supervised, relevant employment and file acceptable reports for each work period.

The basic program leading to the degree in hotel administration, as set forth below, is enriched by a broad selection of free and distributive elective courses offered by the school and elsewhere in the University.

The school’s programs for advanced degrees include those of Master of Professional Studies, Master of Science, and Doctor of Philosophy. For more complete information about undergraduate program requirements, see the school’s admissions catalog. For further information on graduate programs, the reader should consult the Announcements of the Graduate School or contact Professor Michael H. Redlin, the school’s graduate faculty representative.

Requirements for Graduation

Because the school is currently in the process of revising its curricula, the requirements for graduation for students who enter after June 1985 are different from the requirements for students who entered prior to June 1985. Students should consult with their adviser or the school’s registrar for the specific requirements that apply to them. Regularly enrolled students in the School of Hotel Administration are candidates for the degree of Bachelor of Science. The requirements for students who matriculate after June 1985 are:

1) completion of eight terms in residence;*
2) completion, with a minimum average of 2.0, of 120 required and elective credits, as set forth in the table below;
3) completion of 12 credits in a subject concentration ("major");
4) completion of two units of practice credit prior to the last term of residence, as defined below;
5) completion of the University requirement in physical education during the first two terms of residence;
6) attainment of a grade-point average of at least 2.0 in the final semester.

Suggested course programs also appear on the following pages. The core courses account for 67 of the 120 credits needed for graduation, the selected subject concentration accounts for 12 credits, and 18 credits are allotted for distributive electives. The remaining 23 credits may be earned in courses chosen from the offerings of any college of the University, provided that the customary requirements for admission to such courses are met.

Students in the School of Hotel Administration who plan to attend summer school at Cornell or elsewhere or who propose to attend any other university with the expectation that the credit earned will be counted toward the Cornell degree in hotel administration, must obtain the approval of the school in advance. Without advance approval, such credit may not count toward the degree.

Credit earned in military science, aerospace studies, or naval-science courses may be counted in the 23-credit group of free electives.

All students are required by the University to take two courses in physical education, but no credit toward the academic degree is allowed for these courses.

Grading System

Letter grades ranging from A+ to F are given to indicate academic performance in each course. These letter grades are assigned a numerical weight for each term average as follows: A equivalent to 4.0; B to 3.0; C to 2.0; D to 1.0; F to 0.0. For good standing, the student must maintain a minimum average of 2.0. In order to graduate, a cumulative average of 2.0 and a final-term average of 2.0 are required as minimums. Of the free elective courses, a maximum of four credits each term may be taken on a "satisfactory-unsatisfactory" (S-U) basis.

Students whose term averages are at least 3.3 and are composed of at least 12 credits of letter grades with no unsatisfactory or incomplete grades are honored by being placed on the Dean’s List.

Practice-Credit Requirement

As part of degree requirements, each undergraduate enrolled in the School of Hotel Administration must complete a specific set of practice-credit requirements. These requirements are set forth in the Practice Credit Work Handbook for Undergraduates in the School of Hotel Administration. Copies of this document are made available to enrolled students upon request by the school’s registrar.

A limited number of upperclass students are encouraged to enroll in management-intern programs that entail six to eight months of on-the-job managerial instruction and experience. For the details on these programs, see "Directed Study," on the following pages.

Course Requirements for Graduation

Required courses as of June 1985

<table>
<thead>
<tr>
<th>Course Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organization Management: Hotel Administration 103, 303, 403</td>
<td>9</td>
</tr>
<tr>
<td>Human-Resources Management: Hotel Administration 211, 212</td>
<td>6</td>
</tr>
<tr>
<td>Financial Management: Hotel Administration 225, 226, 325</td>
<td>10</td>
</tr>
<tr>
<td>Food and Beverage Management: Hotel Administration 335, 335, 335</td>
<td>12</td>
</tr>
<tr>
<td>Marketing and Tourism: Hotel Administration 241</td>
<td>3</td>
</tr>
<tr>
<td>Properties Management: Hotel Administration 255, 355</td>
<td>6</td>
</tr>
<tr>
<td>Communication: Hotel Administration 165, 365</td>
<td>6</td>
</tr>
<tr>
<td>MIS/Computers: Hotel Administration 174</td>
<td>3</td>
</tr>
<tr>
<td>Law: Hotel Administration 387</td>
<td>3</td>
</tr>
<tr>
<td>Quantitative Methods: I &amp; R 210</td>
<td>3</td>
</tr>
<tr>
<td>Economics: Economics 101, 102</td>
<td>6</td>
</tr>
</tbody>
</table>

Specifically required credits

<table>
<thead>
<tr>
<th>Concentration</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 Distributive electives</td>
<td></td>
</tr>
<tr>
<td>18 Free electives</td>
<td>23</td>
</tr>
</tbody>
</table>

Total credits required for graduation 120
When the student selects one of these major fields of concentration, he or she should consult the coordinator of instruction in that area during the sophomore year to plan the sequence of elective courses that will best fit his or her program.

A list of elective courses offered in the school’s special areas of instruction is provided below.

**Elective Courses in Hotel Administration**

The following is a list of courses currently offered within the School of Hotel Administration that may, as appropriate, be used in partial or full satisfaction of the specified area concentration and the free elective allocation.

The first digit of the course number is indicative of the level of the course, while the second digit indicates the curricular area, according to the following scheme:

**First digit**
- 1 — freshman/introductory
- 2 — sophomore
- 3 — junior
- 4 — senior
- 5 — provisional course offerings
- 6 — undergraduate independent study
- 7 — marketing and tourism
- 8 — food and beverage management
- 9 — properties management
- 0 — other

**Specified area concentration and the free elective allocation.**

**Sophomore Year**

<table>
<thead>
<tr>
<th>Required courses</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>H Adm 211, The Management of Personnel</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 212, Human Relations</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 225, Financial Accounting</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 226, Financial Management</td>
<td>4</td>
</tr>
<tr>
<td>H Adm 235, Food and Beverage Management</td>
<td>4</td>
</tr>
<tr>
<td>H Adm 243, Principles of Marketing</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 255, Properties Management I</td>
<td>3</td>
</tr>
<tr>
<td>Distribution electives</td>
<td>3-6</td>
</tr>
<tr>
<td>Free electives</td>
<td>3-6</td>
</tr>
</tbody>
</table>

**Junior Year**

<table>
<thead>
<tr>
<th>Required courses</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>H Adm 310, Organization Management II</td>
<td>2</td>
</tr>
<tr>
<td>H Adm 325, Hospitality Financial Management III</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 335, Food and Beverage Management</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 355, Properties Management II</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 365, Oral Communication</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 378, Business and Hospitality Law</td>
<td>3</td>
</tr>
<tr>
<td>Concentration</td>
<td>2-6</td>
</tr>
<tr>
<td>Electives</td>
<td>3-6</td>
</tr>
</tbody>
</table>

**Senior Year**

<table>
<thead>
<tr>
<th>Required courses</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>H Adm 403, Integrative Management Capstone</td>
<td>3</td>
</tr>
<tr>
<td>Concentration</td>
<td>3</td>
</tr>
<tr>
<td>Free electives</td>
<td>3</td>
</tr>
</tbody>
</table>

**Programs in Special Areas**

While completing the required courses leading to the bachelor’s degree, undergraduates in the school must also select a concentration: 12 elective credits in a major area of instruction. These include organization management, human-resources management, financial management, food and beverage management, marketing and tourism, properties management, communication, computer systems, and law.

<table>
<thead>
<tr>
<th>Undergraduate Program of Study</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>H Adm 512, Managing Organizational Change and Productivity</td>
<td>2</td>
</tr>
<tr>
<td>H Adm 613, Situational Leadership and Organizational Behavior</td>
<td>X</td>
</tr>
<tr>
<td>H Adm 610, Undergraduate Independent Study — Human Resources Management</td>
<td>V</td>
</tr>
<tr>
<td>H Adm 710, Graduate Independent Research — Human Resources Management</td>
<td>V*</td>
</tr>
<tr>
<td>H Adm 711, Dispute Resolution in Service Industries</td>
<td>3</td>
</tr>
<tr>
<td>Financial Management</td>
<td>Credits</td>
</tr>
<tr>
<td>H Adm 321, Hospitality Management Contracts</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 322, Investment Management</td>
<td>2</td>
</tr>
<tr>
<td>H Adm 323, Financial Analysis and Planning</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 326, Corporate Finance</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 328, Cost Accounting</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 412, Internal Control in Hotels</td>
<td>2</td>
</tr>
<tr>
<td>H Adm 422, Taxation and Management Decisions</td>
<td>2</td>
</tr>
<tr>
<td>H Adm 620, Undergraduate Independent Study — Financial Management</td>
<td>V*</td>
</tr>
<tr>
<td>H Adm 720, Graduate Independent Research — Financial Management</td>
<td>V*</td>
</tr>
<tr>
<td>H Adm 724, Analysis and Interpretation of Financial Statements</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 729, Graduate Investment Portfolio Management</td>
<td>3</td>
</tr>
<tr>
<td>Food and Beverage Management</td>
<td>Credits</td>
</tr>
<tr>
<td>H Adm 234, Food and Beverage Control</td>
<td>2</td>
</tr>
<tr>
<td>H Adm 333, Restaurant Management</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 357, Principles of Nutrition</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 337, Food Composition and Properties</td>
<td>4</td>
</tr>
<tr>
<td>H Adm 338, Selection, Procurement, and Supply Management</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 430, Introduction to Wine and Spirits</td>
<td>2</td>
</tr>
<tr>
<td>H Adm 431, Seminar in Independent Restaurant Operations Management</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 433, Food-service Management in Business-, Industry-, and Health-Related Facilities</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 434, Dessert Merchandising</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 436, Advanced Beverage Management</td>
<td>2</td>
</tr>
<tr>
<td>H Adm 437, Cultural Culinary Arts</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 531, Food and Beverage Operational Management</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 630, Undergraduate Independent Study — Food and Beverage Management</td>
<td>V</td>
</tr>
<tr>
<td>H Adm 730, Graduate Independent Research — Food and Beverage Management</td>
<td>V</td>
</tr>
<tr>
<td>H Adm 733, Sanitation in the Food-service Operation</td>
<td>2</td>
</tr>
<tr>
<td>H Adm 735, Graduate Meat Science and Management</td>
<td>3</td>
</tr>
<tr>
<td>Marketing and Tourism</td>
<td>Credits</td>
</tr>
<tr>
<td>H Adm 244, Tourism I</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 245, Managing the Hotel Sales Function</td>
<td>2</td>
</tr>
<tr>
<td>H Adm 346, Case Studies in Hospitality Marketing</td>
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<td>H Adm 349, Seminar in Selected Topics in Hospitality Marketing</td>
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<td>H Adm 441, Advertising Strategies</td>
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<td>H Adm 444, Tourism II</td>
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<td>H Adm 449, International Marketing in the Hospitality Industry</td>
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<td>H Adm 541, Marketing Communications Strategy</td>
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<td>H Adm 543, Marketing Research</td>
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<tr>
<td>H Adm 640, Undergraduate Independent Study — Marketing and Tourism</td>
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<tr>
<td>H Adm 740, Graduate Independent Research — Marketing and Tourism</td>
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<td>H Adm 742, Strategic Marketing Planning in the Hospitality Industry</td>
<td>3</td>
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<tr>
<td>Properties Management</td>
<td>Credits</td>
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<td>H Adm 256, General Insurance</td>
<td>3</td>
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<tr>
<td>H Adm 350, Personal Real-Estate Investments</td>
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<tr>
<td>H Adm 353, Introductory Food-service Facilities Design</td>
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<tr>
<td>H Adm 354, Advanced Food-service Facilities Planning and Design</td>
<td>3</td>
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<td>H Adm 358, Hospitality-Industry Real Estate</td>
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Candidates for the Master of Professional Studies (M.P.S.) degree pursue one of four tracks in their graduate studies. Students whose undergraduate degrees are in areas other than hotel administration follow track I, for which the required two-year program is set forth below.

The curricula for M.P.S. tracks II and III are specifically designed for each student, based on previous experience and career goals. Students who hold Bachelor of Science degrees in hotel administration from an institution other than Cornell qualify for the track II curriculum. A minimum of three residence units and 48 credits is required to complete track II. Track II students must take 12 credits in a concentration, 6 credits of monograph, 16 elective credits, and any required courses not yet completed prior to their arrival.

Track III is for students who hold a Bachelor of Science degree in hotel administration from Cornell. Two residence units and 32 credits are required to complete track III. Track III students must take 12 credits in a concentration, 6 credits of monograph, and 14 elective credits.

Track IV is for students who hold a master's degree and have no prior degrees in hotel administration. Three residence units and a minimum of 48 credits are required (if no required courses are exempted, 50 credits may be necessary to complete the program). Track IV students must take 12 credits in a concentration, 6 credits of monograph, prerequisites, and any required courses not yet completed.

All students are required to designate an area of concentration before their next-to-last term. Each student also writes an investigative report or monograph, under the guidance of an advisor, to meet requirements for the M.P.S. degree.

**Required Program for M.P.S., Track I**

**Students**

<table>
<thead>
<tr>
<th>Required courses</th>
<th>Credits</th>
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<tr>
<td>H Adm 705, Business Policy</td>
<td>3</td>
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<tr>
<td>H Adm 718, Advanced Human-Resources Management</td>
<td>3</td>
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<tr>
<td>H Adm 725, Graduate Managerial Accounting in the Hospitality Industry</td>
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<td>H Adm 726, Graduate Corporate Finance</td>
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<tr>
<td>H Adm 731, Graduate Food and Beverage Management</td>
<td>3</td>
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<tr>
<td>H Adm 732, Graduate Operational Food-Production Systems</td>
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<tr>
<td>H Adm 741, Marketing Management</td>
<td>3</td>
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<tr>
<td>H Adm 755, Project Development and Construction</td>
<td>3</td>
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<tr>
<td>H Adm 774, Computers and Hotel Computing Applications</td>
<td>3</td>
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<tr>
<td>H Adm 791, Quantitative Methods</td>
<td>3</td>
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<tr>
<td>H Adm 800, M.P.S. Monograph 1</td>
<td>3</td>
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<tr>
<td>H Adm 801, M.P.S. Monograph 2</td>
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**Specifically required credits**

<table>
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<tr>
<th>Concentration credits</th>
<th>Free elective credits</th>
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<tbody>
<tr>
<td>36</td>
<td>12</td>
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</table>

**Total credits required for M.P.S., Track I students**

| 64 |

**Directed Study**

**Independent Research**

Students may conduct independent research (directed study) projects in any academic area of the school under the direction of a faculty member. Credit is arranged on an individual basis. Only the first 3 credits of directed study may be credited against concentration credits and free electives during the undergraduate years. Additional directed study is credited against free electives, with the exception of the management-intern program (see below). To enroll in an independent research project, students must obtain written permission from the school before course registration.

**Management-Intern Program**

This program is open only to upperclass and graduate students. Students accepted into the program earn 12 credits, which can be applied against the concentration requirement (hotel electives) or as free electives. Students enrolled in this program have an opportunity to combine managerial instruction with on-the-job management experience. Application for admission should be made one semester in advance. Instruction is provided by the school's faculty and by the organizations participating in the program. Management-intern positions are available at several locations worldwide, including several on the University campus. Students receive both academic credit and practical experience, and appropriate financial remuneration for the period of the program. The student is charged reduced tuition.

**Study Abroad**

Programs providing an opportunity to study in a foreign country and develop an awareness of the international component of the hospitality industry can contribute to each student's total educational experience. Students in recent years have studied in Italy, Spain, France, and England. Information on the many study abroad programs operating during the summer and academic year is available at the Career Center.

Students should discuss their plans with the school's study abroad representative so that all petition and credit evaluation procedures are followed.

**Current Course Information**

For the most current and detailed information regarding course offerings of the School of Hotel Administration, the student should consult the supplementary course announcement issued each semester by the school's registrar.

**Organization Management Courses**

**102 Distinguished Management Lectures**

Fall. 1 credit. Limited to School of Hotel Administration students except by written permission. Hotel elective. F. 125. Dean, J. C. Clark.

A series of lectures given by nonresident speakers prominent in the hotel, restaurant, and allied fields.

**103 Principles of Management**

Fall. 3 credits. Required. M.W.F.B. P.L. Gaurier.

A basic course designed to examine management processes, concepts, and principles and to improve personal competence in decision making, problem solving, and communication. Required readings highlight both classical and modern concepts of management.

**203 Club Management**

Spring. 7 weeks only. 2 credits. Hotel elective. T 1:25-5. J. Petzing.

The private-membership club and how it differs from other forms of business in the hospitality industry. Topics include constitution and bylaws issues, administration and dealing with board of directors and committees, recreation management, labor management, and marketing of major tournaments.

**204 Franchising in the Hospitality Industry**


Relationships between franchisor and franchisee, advantages and disadvantages of franchising, structure and services offered by franchisors. Case
studies of leading motor-inn and restaurant companies currently offering franchises will be discussed. Guest speakers from the franchising industry.

205 Resort and Condominium Management Fall or spring. 3 credits. Not open to freshmen. Hotel elective.
M W F 10:10-: M. A. Noden
A lecture course in the operation of resort hotels and condominiums. Resorts of various types, seasons, and economic levels are considered. Emphasis is on the promotion of business, the provision of facilities, services, and guest entertainment. Contract and noncontract relationships with the travel industry are reviewed. Terminology, rental-pool agreements, S.E.C. regulations, state statutory requirements, developer-management-owner contracts, and relationships in condominiums are reviewed. Tax implications of both condominium ownership and management are fully considered.

304 Rooms-Division Management—Front Office and Reservations Fall, second 7 weeks only 2 credits. Hotel elective. Estimated cost of required field trip to Washington, D.C., $100.
F 1:25-5:25. S. M. L. Gaumnier
An introductory course concentrating on the fundamentals of rooms-division management. Areas of concentration include front-desk operations, reservations, housekeeping, and telephone departments. Particular emphasis on selling strategies, forecasting, rate efficiencies, labor management, and guest relations.

401 Seminar in Management Principles Fall or spring 2 credits. Limited to 20 seniors and graduate students.
Hotel elective.
T 11:15-1:15 P.L. Gaumnier
This course assesses the case-study approach, and each student prepares a comprehensive analytical report, based on previous work, for class discussion and analysis. Sufficient time is given during the first few weeks of the course to review management principles and concepts and thus give the student an understanding of the type of report he or she is to prepare and of the analysis required during the discussion period.

402 Hospitality-Management Seminar Fall. 1 credit. Limited to 20 seniors and graduate students.
Hotel elective.
F 2:30. Dean J. J. Clark and guest speakers.
A weekly meeting with the H Adm 102 speaker of the day. The subject matter will, therefore, vary from week to week, depending on the area of expertise of the guest speaker. Students will be expected to ask questions and enter into discussion, since the class will be relatively unstructured.

404 Management Organization of the Small Business Spring. 3 credits. Limited to 30 students.
Prerequisite: H Adm 221 or Agricultural Economics 323 or equivalent. Hotel elective. Approximate cost of field trips, $25.
T R 2:30-4:20 R. M. Chasse
The objective of the course is to develop a comprehensive knowledge of basic management fundamentals to plan, organize, direct, and control the small enterprise. Case-study method will be employed in addition to guest lecturers. There will be a term team project, selected readings, and field exercises.

T R 2:30-4:20. S. M. L. Gaumnier
Analysis of case studies involving issues of business strategy, human relations, administration, marketing, and finance. Three guest presentations. Students will apply course principles through participation in a restaurant-management simulation exercise.

407 Seminar in Hotel Operations Spring. 2 credits. Limited to 30 students. Hotel elective. Estimated cost of field trip, $100.
F 10:10-12:05. R. M. Chase and guest speakers.
The objective of this course is to provide students with a working knowledge of the terminology, concepts, and procedures utilized by hotel management in developing information and making decisions relevant to forecasting and controlling manpower requirements consistent with fluctuating business conditions. The course will also pursue approaches designed toward maintaining operational control and evaluating overall performance within the hotel facility. Major topics include staff planning, budgeting, scheduling and payroll control, forecasting technique and practice, considerations for operating within the guidelines of collective bargaining, financial-statement analysis, and hotel case studies oriented toward productivity analysis. A required field trip to the participating hotel will be an integral part of the study program. The field trip is usually scheduled for the second week of classes; therefore a student cannot miss the first week and register in the course. If a student intends to return to school one week late, he or she should not attempt to preregister for this course.

705 Business Policy Spring. 3 credits. M.P.S. requirement. Hours to be arranged. Faculty. The integration and application of management concepts, theories, and practical business situations. Students build upon and integrate academic and practical experience in the analysis of current problems, strategy formulation, and policy implementation. A generalist managerial perspective is developed.

411 Managing an Organization through Simulation Training Spring. 3 credits. Limited to 20 School of Hotel Administration seniors and graduate students.
Hotel elective.
F 9:30-12. W. Wasmuth
The course is based on CHARMS (Cornell Hotel and Restaurant Management Simulation), the simulation of a
hotel banquet facility developed by Professors Wasmuth and Davis. The intent of the course is to help students learn management principles from participation in the simulation and also to provide advanced training in the use of a simulation as a training device. Working in groups of four or five, students will be asked to develop additional portions of the simulation exercise for solution by their peers. A trip to a local banquet facility will be required, for which a small (approximately $1) transportation charge will be assessed.

414 Organizational Behavior and Small-Group Processes Fall. 3 credits. Limited to 30 hotel juniors, seniors, and graduate students by written permission of the instructor. Holley administration.
F 2–4:30. R. A. Morano.
Applications of organizational behavior principles will be explored through lectures, case studies, and management games and exercises. Students will participate in experimental laboratories aimed at enhancing their effectiveness as members or leaders of groups. Topics that will be studied include leadership, decision making, motivation, power, and organizational change.

416 Special Studies in the Management of Human Resources Fall or spring. 3 credits. Limited to seniors and graduate students, except for those who have received written permission of the instructor.
Prerequisites: H Adm 211, Hotel elective.
2–4:30. Faculty.
A totally case-study approach to the problems and challenges of managing people in business organizations. Actual cases are presented by individuals who were involved in the cases. Student (suggested) resolution of the cases will be compared to the resolution that actually took place.

511 Seminar in Current Labor Relations Problems in the Private Sector Spring. 3 credits. Limited to graduate students.
A study of current issues facing labor and management in the private sector service, both unionized and nonunion, with special emphasis on the hospitality industry. For spring 1987 concentration will be on dual pay systems, productivity, grievance machinery, and other items of current interest. A reading packet and list will be supplied to students enrolled in the course well in advance of the first class meeting. The course will include a field trip to New York City. Note: One additional credit may be earned by undertaking a directed research project (H Adm 610).

512 Managing Organizational Change and Productivity Spring. 2 credits. Limited to juniors, seniors, and M.P.S. students. Hotel elective.
Class and lab times to be arranged. K. Blanchard. F. Berger.
The critical issue facing managers today is how to cope with the endless barrage of socio-technological changes that confront them daily. Effective leaders must be able to plan strategies that will enable environmental changes to be directly assimilated into overall organizational development processes. This course will emphasize students' ability to recognize and identify changes in the organizational environment and will provide hands-on practice in the design of a productivity improvement program as a mechanism for organizational development.

513 Situational Leadership and Organizational Behavior Fall. 2 credits. Limited to juniors, seniors, and M.F.S. students. Hotel elective.
Hours to be arranged. K. Blanchard and faculty.
How managers can successfully accomplish the goals of the organization through the efforts of employees. Emphasis is on recent theories of motivation, behavior, and leadership, with direct application to the hospitality industry. Students will learn the basics of situational leadership and be able to apply this knowledge to managerial positions.

718 Advanced Human-Resources Management Fall or spring. 3 credits. Limited to 18 graduate students. Prerequisites: introductory psychology and H Adm 211 or equivalent. M.P.S. requirement.
M 10:10–12:05, plus 1-hour lab to be arranged. One weekend session. F. Berger.
The focus will be on development of human-resources management skills and exploration of the dilemmas and responsibilities of leadership. Students will gain insight into their patterns of management behavior by integrating conceptual material with management games and simulations, interaction analysis, and constructive feedback.

Financial Management Courses

120 Basic Principles of Accounting and Financial Management Fall or spring. 2 credits. Limited to students outside the School of Hotel Administration. W 2:30–4:25, T. Cole.
A survey of accounting principles, financial statements, cash forecasting, and cash budgeting, and an introduction to financial analysis. Intended for students who desire a general language of business and finance. May be taken with H Adm 322 to include the investment aspects of financial management.

125 Finance Fall or spring. 3 credits. Open only to students outside the hotel school.
M W 1:25, plus 1 hour to be arranged. E. Stice.
An objective study of the financial function in a profit-oriented enterprise. Important concepts include cash flow, the time value of money, and capital budgeting. Emphasis is on analysis of accounting information, problem solving, and decision making.

220 Financial Accounting Principles Fall or spring. 3 credits. Limited to students outside the School of Hotel Administration.
T R 11:15–1:10, T. Cole.
An introduction to the basic principles of accounting, involving transaction analysis, flow of accounting data to the financial statements, and careful consideration of accounting for revenues, expenses, assets, liabilities, and owner's equity.

221 Managerial Accounting Fall. 3 credits. Limited to 20 students in each lab. Prerequisite: H Adm 121 or 125, or equivalent. Required.
The use of accounting information for managerial planning, control, and evaluation. Particular emphasis on the fundamentals of costing systems, cost behavior, budget preparation, standard costs, the analysis of variance, and decision-facilitating models.

222 Hospitality Financial Management Fall. Variable credit (maximum, 4). Prerequisite: H Adm 121, 125, or 221, or equivalent. Required. Students who have already completed H Adm 122 register for 3 credits and will not attend the first portion of the course.
Integration of the basics of financial accounting, finance, and managerial accounting in a hospitality industry environment: front-office accounting, the audit, daily report of income, Uniform System of Accounts for Hotels, financial statement preparation, financial statement analysis, cost-volume-profit analysis, internal control, operational budgeting, feasibility studies, and capital budgeting.

225 Financial Accounting Fall. 3 credits. Limited to hotel students. Required.
The basic principles of accounting, including transaction analysis, flow of accounting data to the financial statements, and careful consideration of accounting for revenues, expenses, assets, liabilities, and owner's equity.

226 Managerial Accounting Spring. 4 credits.
For further information, see the registrar at the hotel school.

321 Hospitality Management Contracts Fall. 7 weeks only. 1 credit. Hotel elective. Not offered 1986–87.
The negotiation and the administration of hospitality management contracts are discussed with major emphasis on contract concerns of owners and operators, financial assessment of owner and operator returns, development of negotiating strategies, and alternative forms of operating agreements.

322 Investment Management Fall or spring. 2 credits. Limited to juniors, seniors, and graduate students. Hotel elective.
R 10:10–12:05. A. Arbel.
The course covers institutional and analytical aspects of security analysis and investment management: securities markets, sources of investment information, bonds and stocks valuation models, risk-return analysis, behavior of security prices, portfolio analysis, and portfolio management. The course also covers the capital asset pricing model, the generic stock investment strategy, and the screen to profile approach and their practical implications for security analysis and investment management. Corporate taxation and analysis is discussed and applied in a realistic manner, using large data bases and interactive screening computer packages. No previous knowledge of computers is required.

323 Financial Analysis and Planning Spring. 3 credits. Prerequisite: H Adm 222. Hotel elective.
After defining and describing the environment in which a business organization must design its strategy, an examination will be made of financial-analysis and planning techniques necessary to operate in that environment. Focus on discussion and case studies involving the following areas of financial management: the tax environment, profit planning and forecasting, budgeting, capital-budgeting techniques, and cost-of-capital determination.

326 Corporate Finance Fall or spring. 3 credits. Prerequisite: H Adm 222 or equivalent. Limited to juniors and seniors. Hotel elective (concentration requirement).
T R 2:30–4:25. S. Carville.
Principles of corporate finance and applications, including investments, the financing decision, capital structure, cost of capital, dividend policy short- and intermediate-term financing, capital markets, and the role of financial institutions.

328 Cost Accounting Spring. 3 credits. Prerequisite: H Adm 221 or equivalent. Hotel elective.
Emphasis is on the use of cost-accounting information for managerial planning, control, analysis, and evaluation. The coverage will include the principles of cost accounting, cost-accounting systems, budgeting, and analysis and control, as well as the special topics of joint products, process costing, responsibility accounting, and performance measurement. The course explores advanced managerial accounting concepts and their application to the hospitality industry. Case studies will be used.

421 Internal Control in Hotels Spring. 2 credits. Limited to 30 juniors, seniors, graduate students, and others who have received permission of instructor.
Prerequisite: H Adm 222 or 722, or equivalent. Hotel elective.
M W 11:15. S. A. N. Geller.
Discussion of problems encountered in distributing the accounting and clerical work in hotels and restaurants so as to provide a good system of internal control. Study of many actual cases of the failure of internal control and the analysis of the causes of the failure. Practical problems and actual techniques of functioning systems of internal control are examined.
Food and Beverage Management Courses

135 Culinary Theory and Practice Fall or spring. 4 credits. Required. Lec, 3; Lab, 2. T 11:15–11:45; 12:00–12:30. A. N. Geller. A study of the art and science of food preparation. Emphasis will be placed on the application of scientific principles to the art of cooking.

231 Meat Science and Management Fall. 3 credits. Limited to students who matriculated prior to fall 1986. Required. Lec, 3; Lab, 2. T 11:15–11:45; 12:00–12:30. A. N. Geller. The course provides an introduction to the meat industry, focusing on the selection, processing, and marketing of meat products.

333 Restaurant Management [Fall or] spring. 3 credits. Limited to 30 students. Hotel elective. Prerequisite: H Adm 131, 132, 231, 233, and 331. Not offered fall 1986. T 2:30–4:25, R 2:30. A. N. Geller. This course will take a systems approach to opening, operating, and analyzing a food and beverage facility.

335 Food-Production Management Systems, Fall. May be offered spring 1987. 3 credits. Prerequisite: H Adm 235. Required. Lec, 3; Lab, 2. T 10:10–12:05; R 10:10–12:05. A. N. Geller. A food production management course in which each student participates as manager and team member in a fine-dining restaurant. Topics covered include personnel management, menu planning and analysis, pricing, and performance evaluation.

336 Principles of Nutrition Fall or spring. 3 credits. Prerequisites: H Adm 133 and 235, and corequisite H Adm 331. Not offered fall 1986. T 9:05; R 10:10. B. R. Richmond. Designed especially for students interested in the nutritional aspects of the restaurant industry, particularly health spas and hotels that emphasize physical fitness. The nutrient composition of fresh and processed foods, nutrient handbooks, recommended daily allowances, dietary goals as related to restaurants, nutrition labeling, additives, special diets, and weight control are studied. The uses of nutrients and nutrient interactions are emphasized. An excellent elective for upperclass and graduate students.

337 Food Composition and Properties Fall or spring. 4 credits. Prerequisites: H Adm 135 and 235 (may be taken as a corequisite). Concentration required. Lec, 3; Lab, 1. T 10:10–12:05. S. A. Mutkoski. A study of the chemical composition and microbial aspects of foods as they affect nutritional value and food preparation. Dietary goals and their impact on the restaurant industry and the properties of fats, carbohydrates, and proteins will be discussed and demonstrated.
of this important system can be properly established and professionally managed in a commercial food-service operation.

430 Introduction to Wine and Spirits Fall or spring. 2 credits. S-U grades only. Open to juniors and seniors in the Hotel School and seniors and graduate students in all other colleges. All students must be twenty-one years of age.

W 2:30-4:25. S. A. Mutkoski, C. Muller. The main focus of the course will be on identifying flavor characteristics and the factors that influence flavor. Lectures will be given on tasting techniques, developing a wine cellar, and combining food with wine. Samples from a variety of countries, regions, and vineyards will be evaluated. Preregistered students who do not attend the first class and fail to notify the secretary in 212 Staller Hall of their absence are automatically dropped from the instructors' records. The student must then follow the normal drop procedure in his or her school.

431 Seminar in Independent Restaurant Operations Management Fall or spring. Prerequisite: written permission of instructor. Field trips required. Hotel elective. Lec, T 3:35-5:30. T. J. Kelly. The course is designed for students who have a strong interest in food and beverage operations and who may be considering a career as an entrepreneur. Under the supervision of the instructor, using required readings on current topics and student-developed case studies, the students will visit and analyze in depth various independently owned operations. Emphasis will be on the restaurant's concept and market, organization, ownership, management, physical structure, staff, front-of-the-house operations, back-of-the-house operations, and fiscal integrity. Classes will alternate weekly between field trips and seminar/course presentations. The student can expect to incur expenses over the term of the semester of no more than $250 due to the five field trips.

433 Food-Service Management in Business-, Industry-, and Health-related Facilities Fall or spring. 3 credits. Hotel elective. Hours to be arranged. Faculty: Betty Coven. Characteristics of food-service organization structures, job descriptions, internal and external controls, internal-systems design, specialty food service equipment considerations, and regulations.

434 Dessert Merchandising Fall or spring. 3 credits. Prerequisites: H Adm 331, 335, or 732. Hotel elective. Lec, T 8:30-10; lab, 12:30-5:30. T. Neuhaus. A hands-on course providing exposure to a variety of breads, pastries, cakes, and other desserts. The student develops skills in costing, writing production schedules, and estimating the skills needed to produce a formula. The student also develops a sensitivity for presentation and its effects on sales, and how and when to use convenience items.

436 Advanced Beverage Management Fall or spring. 2 credits. Limited to 30 hotel students. Students must be twenty-one years old. Prerequisite: completion of Adm 435 or 437 elective.

Lec, W 10:10-12:05. S. Mutkoski, C. Muller. This course is designed to meet the needs of upperclass students interested in food and beverage management and for students dealing with the current responsibilities of the service of alcoholic beverages. Lectures will develop skills and awareness of Dram shop; staff training and responsible customer control; beverage pricing; food and wine pairings; wine-list development; purchasing, storage, and service; wine regions; cost controls and loss prevention; and creative beverage merchandising. Numerous guest lecturers will highlight industry trends and outlooks. Advanced tastings will be conducted during class.

437 Cultural Cuisines Spring. 3 credits. Limited to 20 students. Prerequisites: H Adm 335 or 732 and written permission of instructor. Hotel elective. Lec, R 10:10-12:05; lab, M 1:25-6. D. Rumm. The seminar will explore the relationship between culture and cuisine in general and look at specific examples taken from around the world. The students will conduct research, present that research to the class, and direct the preparation of a meal from a selected cuisine. Some of the issues raised will be the relationship between culture and food ways, the influence of the industrialization of food supply on traditional cuisines, and what cuisine means today.

531 Food and Beverage Operational Management 3 credits. Fall or spring. Limited to 16 students. Prerequisites: H Adm 331, 335, or 732, or permission of instructor. Hotel elective. Lec, M 11:15-12:15; lab, F 10:10-1 and 4 Sunday labs, 2-11. J. Knight. This course is designed to provide students with advanced management expertise in food service by working in a restaurant setting during the semester. Students will be involved in the planning, marketing, cooking-serving, and financial analysis of an eight-course gourmet dinner for the university community. Visiting professionals will be featured as guests on selected evenings. Each student will have the opportunity to dine with the guests to analyze the operation from the customer's point of view. Management considerations will be emphasized in the written reports.

731 Graduate Food and Beverage Management Fall or spring. 3 credits. Limited to hotel graduate students. Required M.P.S. course. Estimated cost of field trip, $150.

Lecs, T 9:05-10:20, plus two evening classes to be arranged. S. A. Mutkoski, C. Muller. This course will present state-of-the-art food and beverage knowledge, skills, and attitudes that are being practiced in the hospitality industry. Upon termination of the course each student should possess knowledge of menu planning, merchandising, purchasing, and service. Managerial skills on how to research and document policies, procedures, and standards; how to plan, organize, staff, and direct activities.

732 Graduate Operational Food-Production Systems Fall or spring. Limited to 24 students. Prerequisite: H Adm 731. Required M.P.S. course. Estimated expense for clothing and utensils, $95. Lec, T 9:05-12:05; 8-hour F lab (2:30 to closing). J. B. Knight, R. Spies. The course is designed to teach and apply the fundamentals of food-production systems, from menu planning through service, and to give the student confidence in managing a commercial kitchen or dining room. The lecture-demonstration provides further exposure to managerial as well as technical skills.

733 Sanitation in the Food-service Operation Spring. 2 credits. M.P.S. elective; also open to juniors and seniors.


735 Graduate Meat Science and Management Fall. 3 credits. Limited to 20 graduate students. M.P.S. elective.

W 10:10-11:00. G. Norkus. Purchasing, receiving, storage, preparation, and cost analysis of entire foods: seafood, meat, and poultry. Federal inspection and grading programs, composition and structure, preservation methods, use of extenders and analogs, prepared entrée foods, and contemporary food issues are covered. The course is a seminar-laboratory combination, recommended for those with an interest in food and beverage management and for anyone desiring a better understanding of the foods they consume.

Marketing and Tourism Courses

423 Principles of Marketing Fall or spring. 3 credits. Not open to freshmen. Required outside the School of Hotel Administration. Not open to freshmen. Hotel elective. Lec, T 8:30-9:30 or 9:45-11. L. M. Renaghan, W. H. Kaven. This course is intended to provide the advanced undergraduate hotel administration student with an overview of the discipline of marketing as it applies to the hospitality industry. The primary aim is to understand how a marketing strategy is devised, especially the interrelationship of company objectives, internal resources, and the external operating environment. A second aim is to show how the special nature of services affects the development of marketing strategies in the hospitality industry.

244 Tourism I Fall. 3 credits. Also open to students outside the School of Hotel Administration. Not open to freshmen. Hotel elective. Lec, T 11:15-12:30. M. A. Noden. An introductory course in the study of tourism. The origins and evolution of contemporary tourism will be carefully examined. Students will be familiarized with the various supply components of the tourism industrial base and their integration on an international scale. The effects of mass-volume tourist demand upon destination development will be explored through the use of selected limited case studies. A series of guest lectures by well-known experts from the travel industry will highlight the economic operations and effects of tourism in both the public and private sectors. This course is open to all students in the University and will serve as the principal prerequisite for the advanced course.

245 Managing the Hotel Sales Function Spring. 3 credits. Limited to 30 students. Prerequisite: H Adm 243 or equivalent. Hotel elective. Lec, T 11:15-12:30. L. M. Renaghan. This course is intended for those students contemplating a career in hotel sales or marketing. It is structured around the development of a hotel marketing plan and focuses on the design of appropriate goals and objectives and the implementation of strategies and tactics for major market segments. Students are required to complete a major group project with an assigned hotel.

346 Case Studies in Hospitality Marketing Spring. 2 credits. Prerequisite: H Adm 243 or 241. Hotel elective. Hours to be arranged. W. Kaven. This course, taught as a seminar, will use case studies and related readings to help develop analysis and decision-making skills. Topics will include hotels and restaurants, both chain and independently owned.

349 Seminar in Selected Topics in Hospitality Marketing [Fall or spring. Not offered fall 1986. 3 credits. Hotel elective. Hours to be arranged. Faculty: M. A. Noden. A seminar designed to explore current and special marketing topics.

411 Advertising Strategies Spring. 3 credits. Limited to 50 seniors and graduate students. Prerequisites: 3 credits each of psychology and marketing, or permission of instructor. Hotel elective. M 1:25-5 (second seven weeks of semester only). H. Kaven. The development of effective advertising strategies for consumer goods and hospitality services. Lectures will focus on principles drawn from psychology, communication theory, and marketing.
Properties Management Courses

255 Facilities Development and Planning [Fall or spring. Not offered fall 1986. 4 credits. Required.]
T R 11:15–12:30 plus 2-hour lab. Faculty
This course is aimed at developing the student's understanding of the nature and uses of marketing research, the marketing-research process, and management of the marketing-research function. The course is taught from a managerial perspective, using a combination of lectures, research exercises, case studies, and outside speakers.

541 Marketing Communications Strategy [Fall or spring. Not offered fall 1986. 3 credits. Limited to juniors, seniors, and graduate students. Prerequisite: a previous marketing course.]
Students will learn about the key variables in marketing communication and their proper application in situation analysis; determination of objectives and budgets; analysis of media resources; message creation; measurement; research design and organization, coordination, and evaluation of the promotional program. The course will use text material, case studies, readings, lectures, and key speakers. Upon completion of the course the student should be able to develop, organize, and produce a credible promotion strategy and plan of action.

543 Marketing Research Spring. 3 credits.
Limited to 35 students. Open to juniors, seniors, and graduate students. Prerequisites: for undergraduates, H Adm 282 and 384; for graduate students, H Adm 781. Hotel elective. Required.
Lec, W 6:30–9 p.m. Fall 1986–87.
Lec, W 6:30–9 p.m. Fall 1986–87.
A survey course that will provide students with understanding of the nature and uses of marketing research; research methodology; the marketing-research process, and management of the marketing-research function. The course is taught from a managerial perspective, using a combination of lectures, research exercises, case studies, and outside speakers.

741 Marketing Management Fall. 3 credits. Required. M.P.S. course.
T R 10:50–12:05. L. M. Renaghan
The management of the corporate marketing function, with emphasis on firms in the hospitality industry. The emphasis is on developing the student's organizational, analytical, and decision-making capabilities through involvement in case experiences. No prior marketing knowledge is assumed.

742 Strategic Market Planning In the Hospitality Industry Fall or spring. 3 credits. Hotel elective. Not offered 1986–87.
W 6:30–9 p.m. C. W. Hart
The application of strategic market planning concepts to firms involved in aspects of the hospitality industry. Topics include the concept of corporate mission, using marketing concepts to establish corporate goals and objectives, techniques of analyzing business, turnaround management, and strategy formulation and implementation. These topics will be covered through the use of articles, readings, lectures, outside speakers, and case studies.

535 Introductory Food-Service Facilities Design Fall. 3 credits. Limited to 15 students. Prerequisites: H Adm 252 or 331 or equivalent, and written permission of instructor. Hotel elective.
A course designed to familiarize the student with the basic concepts of food-service facilities design and planning. Studies are carried out to determine space allocation for kitchen, refrigeration, storage, waste disposal, and service areas. Development of basic production work flow in the preparation and service areas is emphasized. The basic requirements for the selection of equipment using industry standards for production capability, quality of construction, and ease of maintenance are stressed. Students will use laboratory time for the planning, design, and specification writing for a small- to medium-size restaurant kitchen.

354 Advanced Food-Service Facilities Planning and Design Spring. 3 credits. Prerequisite: H Adm 353 or equivalent. Hotel elective.
Lecs, M W 10 10, 2-hour lab to be arranged. M. H. Redlin.
A course designed to employ the basic concepts of food-service facilities design and planning in advanced applications. Facilities for a medium-size hotel are developed. Emphasis on preparing a program, developing equipment layouts, and making presentations to clients.

355 Building Construction and Operations Spring. 3 credits. Required.
Hours to be arranged. R. A. Compton.

The construction process, including project management, scheduling, contracts, materials, methods of installation, and cost considerations. An overview of building mechanical and electrical systems selection, installation, and operation. The responsibilities of the engineering-maintenance department.

356 Building Engineering Systems Fall or spring. 3 credits. Prerequisite: H Adm 251, 252, or 751 or written permission of instructor. Required. M W 1:25 and F 2:30, plus 1-hour lab. D. M. Stipanuk.
This course provides an overview of the major systems that comprise the physical plant in hospitality buildings. The primary emphasis is on the students' acquiring a basic understanding of water, electric, heating, cooling, and refrigeration systems and their effect on building operations. An introduction to energy-management systems and techniques is also included.

357 Construction and Physical-Plant Management Fall or spring. 3 credits. Prerequisite: H Adm 356. Required.
M W 12:20, plus 1-hour lab. R. A. Compton.
Course components include construction contracts, bid procedures and analysis, management of new and renovated projects, CPM, construction budgeting and financing, construction materials and methods, organization and management of the POMSE department, security and life-safety systems, and routine and preventive maintenance. This course requires students to spend the knowledge gained in the previous properties management courses as well as other School of Hotel Administration required courses, such as accounting and financial management, information systems, and hotel and food. Case studies, recital assignments, and projects are an integral part of the course.

358 Hospitality-Industry Real Estate Spring. 3 credits. Prerequisites: H Adm 121, 125, 281, 282, or equivalent, or written permission of instructor. Hotel elective.
Strategic considerations and tactical implementation of developing a hospitality firm's physical distribution network through the opening of new units. The role of real estate as a capital investment is related to marketing strategies, investment decisions, and the financing involved in opening new units, with special emphasis on the effects of real-estate funding on the rate of return on investment, overall corporate financial structure, and a firm's ability to finance future units. Selecting new sites, negotiating for their acquisition or use, and financing are discussed in detail. Lectures develop the students' conceptual framework and practical knowledge in these areas. Case studies and reports develop the students' ability to apply these concepts.

452 Hotel Planning and Interior Design Spring. 3 credits. Limited to 12 juniors, seniors, and graduate students. Prerequisite: H Adm 252. Hotel elective. Minimum cost of required field trip, $200.
A project course concerned with hotel and restaurant planning, interior design, and renovation. Students will establish the operator's criteria for the design of hotel guest rooms and public areas, prepare budgets, and develop preliminary conceptual designs leading to a substantial graphic presentation at the end of the term. Drawing ability is essential.

453 Energy Management Fall or spring. 3 credits (2-credit option available). Prerequisite: H Adm 356 or 752. Hotel elective.
T R 1–2: 15. D. M. Stipanuk.
Energy audits, management of energy programs, cost-reduction methods, financing and economics of energy management, case studies of commercial building energy management programs.
751 Project Development and Construction
Fall, 3 credits. Prerequisite: M.F.S. course.
An overview of project development, planning and design, construction management, and building systems for the hospitality industry. Topics emphasize the managers' or owners' responsibilities in a project and include a survey of current practices in hotel and restaurant development and design.

Communication Courses
161 Keyboarding for Managers on the Macintosh
Fall, spring, or summer. 2 credits. Limited to 25 students per section. Hotel elective. M.W. F 11:15; M.W 1:25 and F 12:20; or T.R.F 9:05.
B. B. David.
An introduction to the Macintosh computer and a beginning course in alphabetic and numeric keyboarding. Students will learn word-processing skills during the second half of the course.

165 Introduction to Writing for Business
Fall or spring. 3 credits. Each section limited to 20 students. Required. Please note: Because of the class-size limitation, a student who drops this course should notify the instructor no later than the end of the first week of class so another student can fill the opening. Must be completed in the freshman year. M.W F 1:00, 10:10, or T.R.F 9:05-10:30; 2:30-4: J. F. Lumley. D. Jameson, C. Badaracco, G. D. Flash.
Written reports provide the information people in organizations need to form judgments and to make decisions. To succeed in its purpose of informing, analyzing, or recommending, a report needs logical organization, appropriately developed material, and effective use of language. This course focuses on strengthening skills in organizing and outlining, understanding and using research sources, and developing skills in writing clearly and precisely. To apply the skills, students write both internal and external reports.

265 Effective Oral Communication in Organizations
Fall or spring. 3 credits. Limited to 25 students per section. Required. Lecs, M. 1:25-3:20; W 1:25; T.R.F 9:05-11; R. F 9:05-11; or W 9:05-11; R 10:10. Individual conferences arranged throughout the term. F. A. Herman and faculty. This seminar introduces students (1) express themselves clearly and effectively and (2) acquire skills to better understand the ideas of others. Principles of the communication process are explored, tested, and reinforced during the term through class participation, group interaction, case studies, debates, and individual and group videotaped presentations.

266 Intermediate French: Le Français de l'Hôtellerie (see also French 1235)
Fall or spring. 3 credits. Limited to 12 students in each recitation section. Prerequisites: French 122 or equivalent or written permission of instructor. Hotel elective. Lecs, M.W. F 12:20, plus 1-hour sec to be scheduled. A. Levy.
This course continues studying the French language, in the context of business affairs, with specific emphasis on the hospitality industry. Presentation of material will consider cultural, geographic, economic, historical, political, and social contexts within which the business functions. The course will be conducted in French, emphasizing a conversational approach. Specialized situations and vocabulary will be used in building general competence in practical usage. Students with good spoken skills and a special interest in the hospitality industry will be given priority for admission to the course.

364 Advanced Business Writing
Fall or spring. 2 credits. Limited to 14 juniors, seniors, and graduate students. Prerequisite for hotel undergraduates only: H. Adm 165. Hotel elective. T R 9:05-10: D. G. Flash.
This course focuses on the written communications that demand special persuasiveness and control of tone. Some examples of the kinds of communications that are analyzed, evaluated, and written are negative messages such as refusal, rejection, and responses to complaints; persuasive administrative messages to both subordinates and superiors in an organization; and sales letters and other promotion materials. One major topic is how to plan and execute a job-hunting campaign, both before college graduation and later in one's career. Students prepare resumes, letters of application, and follow-up messages adapted to their individual needs. Conferences will be held to discuss these and other writing assignments. The writing assignments will give students a chance to apply the theories of communication, semantics, and human relations covered in the reading assignments and in class discussions.

765 Effective Oral Communication in Organizations
Fall or spring, weeks 1-7, 1-7, 1 credit. Limited to 20 graduate students. Hotel elective.
M. W 8-9 p.m. R. Alvarez.
This course will concentrate on helping students in three areas: (1) making extemporaneous presentations on business topics with effective presentation design and delivery techniques; (2) selecting appropriate audiovisual support and using it effectively; (3) learning how to listen, interview, and run productive meetings. Video camera and tapes will be used in the classroom throughout the period. Individual conferences will be held at the beginning and end of the course.

MIS/Computers Courses
174 Information Systems
Fall or spring. 3 credits. Required. M. W 9:05; lab, M. W. or R 10 12:20, or 1:25, or T.R. 11 or 1:25. R. Alvarez.
An introduction to information systems and computing machines. Students learn basic programming skills for application to selected business problems. The concept of file processing is introduced to provide the student with an understanding of processing as it applies to the hospitality industry. Programs are executed on the University's computing system. Finally, the student will introduce the student to the personal computer using electronic spreadsheet and word processing applications.

274 Hotel Computing Applications
Fall or spring. 3 credits. Prerequisite: H. Adm 174 or equivalent. Hotel elective.
M. W 11:15-2:00; R. R. Moore.
The course exposes students to concepts of data-base management and management information systems as they relate to computing technology in the hospitality industry. Specific areas covered are hotel systems, wide-based reservations systems, communications, and food and beverage systems. Laboratories will provide practical experience with computer-based systems.

275 End-user Business Computing
Fall or spring. 3 credits. Prerequisite: H. Adm 174 or equivalent. Hotel elective.
Lecs, T R 11-12:30; lab, M. W. F 8:15, 10:15, 12:30, 1:25, 2:20, or 3:35. R. G. Moore.
This course explores the personal computer as a managerial tool for the hospitality industry. Concepts of modeling, data-base, and systems design are covered. Students learn to use specific software applications programs to solve original problems.
571 Seminars in Selected Topics: End-user Computing
Fall or spring. 3 credits. Limited to 15 students. Prerequisites: H Adm 341 or 774 and permission of instructors. Hotel elective.
Lec, T 2:30-4:25; lab hours to be arranged. R. Alvarez, R. G. Moore.
For students who have a good understanding of the personal computer and of popular word-processing, spreadsheet, and data-management packages. The course builds upon previously acquired knowledge to expose the student to the newest metaphor software for microcomputers. The role of the PC and its relation to other PCs and mainframe computers is explored. Managerial issues involving data integrity, data sufficiency, access, financial impact, decision making, training, support and education, and organizational impact will be examined.

774 Computers and Hotel Computing Applications
Lecs, M 2:30-4:25, W 1:25; 2-hour lab to be arranged. R. G. Moore.
The first segment of the course is devoted to learning computer concepts and elementary programming. During the second part of the course, the introduction of the computing machine-information system to the hospitality industry is examined from several viewpoints: data base design, management information system concepts, and actual system application. Students in the course will be given hands-on exposure to various hospitality information systems. The third part introduces the students to the personal computer using electronic spreadsheets, and word processing applications.

Law Courses

283 Law of Securities Regulation
Fall, first 7 weeks. 1 credit. Hotel elective.
M 1:25-3:20; P. E. Panarites.
For students interested in the financing of new or expanding hotel and restaurant businesses through the sale of stocks and bonds, and the obligations of publicly owned hospitality companies and their officers and directors. The course covers fundamental aspects of the federal securities law, as well as applicable to the hospitality industry. Problems will be drawn from hotel, restaurant, and related businesses.

287 Law and the Woman Employee
Spring. 3 credits. Hotel elective.
Hours to be arranged. J. E. H. Sherry.
Designed to enable management to deal with the legal problems of female employees as these problems affect the hospitality industry and to provide information regarding the emerging legal rights of women generally.

285 Law of Business I
Fall. 3 credits. Limited to juniors and seniors. Required.
This course is designed to enable the student to acquire a basic understanding of law and legal relationships in a business context. A variety of subjects are covered, all intended to aid a person in making decisions as an executive charged with managerial responsibilities.

286 Law of Inkeeping
Fall or spring. 3 credits. Limited to juniors and seniors. Prerequisite: H Adm 341 or equivalent. Required.
The aim of this course is to give the student a basic grounding in the fundamentals of hotel and restaurant management as they affect legal rights and responsibilities. Emphasis is on recognition of issues and organization of solutions in a logical, well-conceived manner.

485 Law of Business II
Spring. 3 credits. Open only to juniors, seniors, or graduate students. Hotel elective.
Laws pertaining to the Uniform Commercial Code, bailments, trusts and estates, transfers of will, unfair competition and trade regulation, bankruptcy, and insurance.

486 Historical Introduction to Public Hospitality Law and Its Impact on American Society
Summer. 3 credits.
M F 8:30-9:45 J. E. H. Sherry.
An overview of the development of the legal rights of persons to travel and to have access to public accommodations. Historical sources focus upon the English common law, the United States Constitution, and federal and state civil rights legislation. The aim of the course is to review and examine changing American social attitudes toward travel and public accommodations and their influence upon travelers' legal rights and responsibilities.

487 Real Estate Law
Offered on demand. 2 credits. Limited to juniors, seniors, and graduate students. Hotel elective.
Hours to be arranged. J. E. H. Sherry.
Laws governing the acquisition, ownership, and transfer of real estate, beginning with the purchase and sale of a family residence and leading to more complex transactions involving hotels, motels, condominiums, cooperatives, syndications, and real estate trusts. Financing aspects, including construction and building loans, mortgages, and mortgage foreclosures, are treated from the viewpoint of lender and borrower. The legal relations of landlord and tenant are given special attention, and typical hotel and motel leases are dissected and scrutinized. Applicable tax considerations are focused on all transactions.

Other Management Support Courses

191 Quantitative Methods
Spring. 3 credits. Required under the new curriculum. Not offered 1986-87.
Lecs, M W 12:20, lab, M or W 2:30-4:25 T. Cullen.
Procedures for collecting, classifying, summarizing, and presenting quantitative facts. Students should get an intuitive grasp of descriptive and inferential statistics. The how, when, and why of statistical applications in a variety of managerial situations, with emphasis on interpretation—not mathematical proofs.

791 Graduate Quantitative Methods
Fall or spring. 3 credits. M.P.S. requirement.
M W F 9:05 C. Lambert.
An introduction to management science models and statistical techniques applicable to the hospitality industry. The application of specific quantitative methods to decision making in the hospitality industry.

Independent Research Courses

600-690 Undergraduate Independent Study
Fall or spring. Variable credit. Prerequisite: written permission. Hotel elective. Only the first three credits of directed study may count as hotel electives during the student's undergraduate academic career. An additional directed study, if taken, is applied toward free electives, except for the management-elective program of 12 credits. Permission in writing is required before course enrollment. Students should obtain permission form from the school registrar, 137 Statler Hall. (Occasionally an independent research project can be added after the three-week deadline with support of the faculty sponsor and by formal petition.)

Faculty Roster

Professors

Arbel, Aynor, Ph.D., New York U. Prof.
Berger, Florence, Ph.D., Cornell U. Assoc. Prof.
Brownell, Judith, Ph.D., Syracuse U. Asst. Prof.
Carrell, Stephen A., Ph.D., SUNY Binghamton. Asst. Prof.
Chase, Robert M., M.B.A., Cornell U. Prof.
Adjunct, Visiting, and Other
Teaching Staff

Alvarez, Roy M. Ed., Lecturer
Badaracco, Claire M., Ph.D., Lecturer
Bamford, Carl A.O.S., Teaching Support Specialist
Blanchard, Kenneth, Ph.D., Visiting Assoc. Prof.
Compton, Richard A., M.S., Senior Lecturer
D'Aprix, David B.A., Lecturer
David, Betty B., Lecturer
Degan, Melissa A.O.S., Teaching Support Specialist
Flash, Dora G., A.B., Senior Lecturer
Kaler, Howard B.S., Lecturer
Lambert, Carolyn, Ph.D., Visiting Assoc. Prof.
Lumley, Jane M.A., Senior Lecturer
McNeill, Keith B.S., Lecturer
Macomber, Dean M., M.S., Visiting Lecturer
Morano, Richard A., D.Ed., Visiting Lecturer
Muller, Christopher C., M.P.S., Teaching Support Specialist
Neuhaus, Thomas W., M.S., Lecturer
Noden, Malcolm A., Senior Lecturer
Norkus, Gregory X., B.S., Lecturer
O'Connor, Therese A., M.S., Lecturer
Panarites, Peter L.L.B., Visiting Assoc. Prof.
Petzing, James E., B.S., Visiting Lecturer
Pezzotti, Giuseppe G. B., B.S., Teaching Support Specialist
Richmond, Bonnie S., M.S., Lecturer
Sciarabba, Andrew B.B.A., Visiting Lecturer
Sher, David M., Senior Lecturer
Spies, Rupert, Studienassessor (a.D.), Teaching Support Specialist
Talbert, Keith E., B.Arch., Lecturer
Weisz, Stephen B.S., Visiting Lecturer
White, Robert A.O.S., Teaching Support Specialist
Whitehead, Donald E., B.S., Visiting Lecturer
Yesawich, Peter C., Ph.D., Visiting Assoc. Prof.
New York State College of Human Ecology

Administration
Jerome M. Ziegler, dean
Nancy Saltford, associate dean; associate director, Cornell University Agricultural Experiment Station
Lucinda A. Noble, associate dean; director of Cornell Cooperative Extension
Carol L. Anderson, assistant dean; associate director of Cornell Cooperative Extension
Charles McClintock, assistant dean, educational programs and policy
Carolyn Cook, director, alumni affairs
Brenda Bricker, director, admissions
Joyce McAllister, registrar
Clarence H. Reed, director, special educational projects
Lynne M. Wiley, director, student services

Division of Student Services
C. McClintock, assistant dean for educational programs and policy
W. Bricker, director of admissions
W. Graham, director of institutional studies
J. McAllister, college registrar
L. Wiley, director of student services

Persons interested in undergraduate study in human ecology should contact the Office of Admissions, 172 Van Rensselaer Hall. Those interested in graduate study should contact the graduate field representative identified among the faculty of each department. Department faculty are listed on subsequent pages at the beginning of the course descriptions for each department.

Matriculated students can find assistance with matters of academic credit and graduation requirements in the Office of the College Registrar, 146 Van Rensselaer Hall. Assistance with academic advising, career planning, and placement, and personal counseling may be obtained from the Office of Student Services, N-101 Martha Van Rensselaer Hall.

The Students
The College of Human Ecology undergraduate enrollment is 1,215, with 53 percent in the upper division. About 304 students are graduated each year, and approximately 265 freshmen and 93 transfer students matriculate. One hundred faculty members serve as advisers for undergraduates. About 175 graduate students have members of the college's faculty chairing their special committees.

The college admissions committee selects applicants who are academically well prepared and appear most likely to profit from the college's various curricula. About forty master's degrees and twenty-five doctorates are awarded each year. Admission is selective. Three out of four freshmen were in the top 10 percent of their high school graduating classes. Mean Scholastic Aptitude Test (SAT) scores for freshmen accepted in fall 1985 were 576 verbal and 635 mathematics.

Approximately 75 percent of the student body comes from New York State, with the remainder from other parts of the United States and abroad. Fourteen percent are identified as members of minority or ethnic groups.

Students of Mature Status
The college recognizes that students who interrupted their formal education and are returning to school have needs different from those of the average undergraduate. To facilitate the education of mature students, defined as those twenty-four years old or older at matriculation, the college has adopted certain procedures specifically for that group.

Mature students are permitted to enroll for as few as 6 credits without petitioning and are also permitted to extend their residency beyond the normal eight terms. It is highly recommended that mature students contact Valerie Sellers, the director of the Continuing Education Information Center, B12 Ives Hall, for information on services available through that office.

Special Students
Students eligible for special status are those visiting from other institutions and interested in particular programs in the college; those with a bachelor's degree preparing for graduate study or jobs and careers in human ecology-related fields; or those who have interrupted their education and are considering completing degree programs. Students accepted in the non-degree status of special student may enroll for a maximum of two semesters. During the second semester of attendance, a special student must either apply for admission as a transfer or plan to terminate studies in the college at the end of the semester.

Specialized equipment for teaching and research includes biochemical and chemical instruments for specrotecscopy, chromatography, radiotrace analysis, electrophoresis, microscopy, and ultracentrifugation; physical testing equipment such as an instron; and cameras, videotape, and sound-recording equipment.

Academic Programs

Facilities
The College of Human Ecology, through its teaching, research, and extension programs, seeks to understand and improve the relations of people to their environments, especially those settings most critical for growth and development—home, school, work, and leisure. Faculty and students study individuals in relation to their family, neighborhood, workplace, and community, seeking a balance between theory and practice that will improve the quality of everyday life.

The college is housed in Martha Van Rensselaer Hall. The Division of Nutritional Sciences, an intercollege division supported jointly by this college and the College of Agriculture and Life Sciences, has space in Savage Hall and in Martha Van Rensselaer Hall.

The buildings include administrative and faculty offices, classrooms, auditoriums, and lecture halls; wet chemistry and biochemistry laboratories for nutrition, food science, and textile science; experimental food laboratories; design studios; woodworking shops; a children's creative-art laboratory; experimental observation rooms with one-way vision screens and sound-recording equipment; educational television studios; and a printing and reproduction facility. Also included are learning resource centers for career planning and academic study, a historical costume collection, a human metabolic research unit, a research animal facility, cold rooms, a constant temperature and humidity laboratory, and an experimental nursery school.

Specialized equipment for teaching and research includes biochemical and chemical instruments for spectrotecscopy, chromatography, radiotrace analysis, electrophoresis, microscopy, and ultracentrifugation; physical testing equipment such as an instron; and cameras, videotape, and sound-recording equipment.

Degree Programs

Degree
B.S.
B.S.
B.S.
B.S.
B.S.
B.S.
B.S.
B.S.
B.S.

Academic Programs

Majors

Consumer Economics and Housing (CEH): consumer economics, housing.
Design and Environmental Analysis (DEA): interior design facility planning and management, human-environment relations.
Human Development and Family Studies (HDFS): does not have separate options. Courses focus on cognitive, personality, and social development, infant through adolescent development, atypical development, and family studies.
Human Service Studies (HSS): does not have separate options. Courses focus on human-service environments, programs, and processes. A professional internship and senior seminar are required. Students may meet the requirements of an accredited bachelor's degree program in social work.
Nutritional Sciences (NS): experimental and consumer food studies, nutrition, nutritional biochemistry, clinical nutrition, community nutrition. (By careful planning, students may also meet the minimum academic requirements of the American Dietetic Association.)

Textiles and Apparel (TXA): apparel design, apparel-textile management, textile science.

Interdepartmental Major in Biology and Society (ID-BS).
Interdepartmental Major in Policy Analysis.

Individual Curriculum: It is possible to develop an individual program of study if none of the above programs fits particular educational and career objectives.

Changing Majors

Because any student's interests and goals may change as new options emerge, the college provides ways for students to change their majors. When a declared...
Design and Environmental Analysis

The Department of Design and Environmental Analysis (DEA) is concerned with planning, designing, and managing interior environments to satisfy human needs. Most people spend over 90 percent of their lives inside buildings. These settings have substantial and far-reaching effects on the quality of our lives. The processes for creating and maintaining the built environment face enormous challenges. These include frequent social and organizational change, technological advances, new building methods, and finite resources. The program in DEA is dedicated to preparing professionals who can meet these challenges.

Diverse faculty backgrounds and teaching approaches help students to develop their multidisciplinary problem-solving and creative abilities, aesthetic judgment, and analytical thinking. Excellent laboratory, shop, studio, and computer facilities permit exploration of innovative concepts for the design and management of interior environments. The relationship between people and their physical surroundings is explored through a combination of academic courses, field experience, and applied research. Examples of student class projects and faculty work are frequently on display in the department's gallery. The DEA Resource Center includes books, journals, newsletters, and materials samples for student use.

Academic Advising

All DEA majors are matched with a faculty adviser during their first semester by advising coordinator Michael Boyd, in E-410 Martha Van Rensselaer Hall. Consultation with faculty advisers about future goals, department requirements, sequences of courses, and electives inside or outside the college to meet special needs helps students develop their programs. Students in interior design, especially, must begin early to plan and collect materials for a portfolio of their work, necessary for many positions and for application to graduate schools. Faculty advisers can make recommendations on what to include. Students are free to change advisers. Although advisers must sign the green schedule card during course enrollment each term, it is the student's responsibility to keep track of his or her courses and to make sure that the program meets graduation requirements for the major and the college.

Options

Two options are offered to undergraduates majoring in the department: consumer economics or housing. Either provides excellent preparation for employment in government, business, and continuing education programs such as cooperative extension. They also provide an excellent undergraduate foundation for further studies in law, economics, and business.

In addition to courses to be taken within the department, each option presents alternatives for the thorough development of a related interest.

Option I: Consumer Economics

Consumer economics is concerned with the economic behavior and welfare of consumers in the private and public sectors of the economy: how consumers allocate their scarce resources, especially time and money. This option requires an understanding of the market economy, of consumers' rights and responsibilities, and of household production, consumption, and management. Graduates may choose to work in government agencies providing consumer services, in business and industry, or in consumer-related community programs.

Option II: Housing

Housing, a major societal problem, is studied through an interdisciplinary approach that includes sociology and economics. The sociological approach considers the interplay between housing demand and population trends, analyzing such contemporary issues as residential segregation and population mobility. The economics of housing familiarizes the student with the operations of the housing market, including supply and demand, production and consumption, and finance. The role of federal, state, and local governments in designing and implementing housing policies is scrutinized. Careful analysis and evaluation of housing research are stressed.

Option II: Facility Planning and Management

This option focuses on the planning and management of complex settings such as the office, health-care facilities, research laboratories, and residential complexes. Facility planning and management is a basic management function that coordinates and integrates information and expertise from areas such as space planning and design, real estate, business administration, human factors—ergonomics, environmental psychology, telecommunications, and building operations for the purpose of developing and managing facilities that support individual and organizational effectiveness.

Excellent career opportunities exist in the facility management divisions of private companies, institutions, and the health-care industry. Opportunities exist for graduate study in business, planning, or one of the design disciplines.

Option III: Human-Environment Relations

Human-environment relations focuses on the interaction between people and their physical surroundings. This option seeks to expand understanding of how the environment affects human perception, cognition, motivation, performance, health, safety, and social behavior. The effect of human capabilities or characteristics such as family structure, life-style, social class, and stage in life cycle on environmental needs and requirements is also a focus of the program.

Human-environment relations is good preparation for graduate study leading to a Ph.D. degree in the social sciences and a career in academic or other research-oriented settings in either the public or private sector. It can also serve as the basis for graduate study in an environmental planning or design discipline such as architecture, facility planning and management, interior design, landscape architecture, or city and regional planning.

Evaluative in the social sciences and in research methods and statistics are appropriate.

Human Development and Family Studies

The programs of the Department of Human Development and Family Studies (HDFS) are concerned with how people develop through the life course. Of equal interest is the family as a context for individual development and as a part of the larger structure of society. An ecological perspective—the person in interaction with biological, situational, and environmental conditions of everyday life—is featured in many departmental courses.

Major social science disciplines concerned with the development of individuals and with the structure and function of families are represented among faculty members with backgrounds in psychology, sociology, history, and education. The department's programs of instruction, extension, and research provide diverse opportunities for students to prepare for career development or to acquire the bases for graduate study. Many of the department's majors are interested in medicine, law, counseling, clinical psychology, special education, or university teaching and research, which require some graduate study. Others may take bachelor's-level positions as youth counselors, day-care workers, personnel assistants, research technicians, social program assistants, etc. The department does not offer programs leading to teaching certification at any level.

The Curriculum

HDFS majors usually combine a broad liberal education with a more specialized focus on either a problem of human concern or a substantive area of concentration. Areas of specialization available within HDFS include infant, child, adolescent, and adult development; abnormal development; family studies; and social-personality and cognitive development. Some students combine an HDFS major with
premedical or prelaw training or with specialized work in an area outside the department, such as communication arts, nutrition, business, or government.

During their first two years, students are expected to combine a variety of liberal arts courses with HDFS core courses HDFS 115 (Human Development: Infancy and Child Care) and HDFS 150 (Families in Modern Society), and of the following four courses: HDFS 216 (Adolescence and Youth: Biological and Cognitive Development), HDFS 217 (Adolescence and Youth: Personality for Professional Development), HDFS 218 (Adulthood and Aging: Personality and Social Development), and HDFS 219 (Adulthood and Aging: Biological and Cognitive Development). This encourages diversity yet ensures a common base for upper-level courses in the major. Courses within the department vary from lectures and discussions to research and independent study.

All students are encouraged to participate in an experiential learning course in their particular area of interest. The course may focus on a naturalistic or laboratory setting (e.g., nursery school, youth detention center, retirement home) or on a research setting (e.g., interviewing, administering tests, observing behavior).

An HDFS major also takes upper-level courses in areas to be selected. Additional information is available in the HDFS Office of Undergraduate Education, NG21 Martha Van Rensselaer Hall.

Honors Program
The honors program leading to a Bachelor of Science degree with honors in HDFS is designed to provide in-depth research experience for students interested in graduate school and to challenge students who enjoy research. Interested students should notify the coordinator of the honors program during the second term of their sophomore year or in the first semester of the junior year.

A grade-point average of 3.5 is recommended for entry into the program, although promising students who lack the grade-point average also may apply if they can otherwise demonstrate their potential for honors work. Honors students must take a course in research design, preferably in the sophomore or junior year.

Students spend part of their junior and senior year working on a thesis under faculty supervision, completing the project before March 15 of the senior year, when the student’s oral examination is held. More information is available in the department’s Office of Undergraduate Education, NG21 Martha Van Rensselaer Hall.

Human Service Studies
Faculty in the Department of Human Service Studies (HSS) prepare students for a variety of careers in programs that serve individuals, families, and the community. HSS graduates work in schools, social services, cooperative extension, health and mental health programs, and community development agencies. They are employed in positions such as counselors, school social workers, community educators, planners, and researchers. Many HSS graduates pursue graduate study in law, education, medicine, social work, health, and a variety of social sciences. HSS majors come from diverse backgrounds, but they share a common goal of wanting to serve the needs of others.

HSS is unique in that it integrates a broad spectrum of courses offered by several departments and college faculties into a professional program of the Human Service Studies major. Students acquire a broad understanding of service processes, a professional internship, and an academic program that provides the equivalent of the first-year curriculum of a master’s program in social work. For additional information, check with the HSS advising coordinator.

Social Work Program
The undergraduate program in social work at Cornell has three major goals: to prepare students for positions in the field that do not require advanced degrees; to prepare students for graduate education in social work; and to contribute to the enrichment of a general college education by helping students understand social-welfare needs, service, and issues. The social work program is accredited by the Council on Social Work Education. Students who complete all requirements are eligible for application for internships in graduate schools of social work or for beginning-level employment as professional social workers.

Textiles and Apparel
The Department of Textiles and Apparel (TXA) focuses on the roles of textiles and fibrous materials for apparel, durable and nondurable household goods, composites, and biomedical applications. Programs in the department, in keeping with the overall mission of the college, emphasize the needs of individuals, families, and other groups who use textiles and textile products. The curriculum includes the application of design principles, physical and materials science, economics and marketing, government policy regulation, and management of products and their delivery.

Practical problem-solving skills are developed in the department’s laboratories and studios, and academic course work is further enhanced by field experiences. Gallery space provides the setting to display student projects and faculty work. In addition, the Cornell University Costume Collection, housed in the department, provides a valuable resource; items from the collection are made available to students for classroom and special-study use.

Academic Advising
All TXA majors are matched with a faculty adviser by the advising coordinator, Anita Racine (411 Martha Van Rensselaer Hall). Students are strongly urged to discuss their goals, course selection and sequence, and electives with their faculty adviser. Students in apparel design must begin early to work with their advisers to develop a professional portfolio of their work. Students are free to change advisers; changes must be cleared through the advising coordinator. Although advisers must sign the green schedule card during course enrollment each term, it is the student’s responsibility to keep track of courses and to make sure that the program meets graduation requirements for the major and the college.

Ownership and Exhibition of Student Work
All apparel design work done in studios as part of the academic program is the property of the student until it has been released by the instructor. Certain exceptional work may be retained by the department to exhibit for academic purposes. The department is not responsible for loss or theft of student work.

Options
Students may select options in apparel design, apparel-textile management, or textile science that are currently offered as part of the academic program of the Department of Design and Environmental Analysis. The options are based on subject matter in the manipulation of form, color, and the physical characteristics and structures of fabric to solve functional and aesthetic apparel problems; the application of economic and marketing principles to consumer and industry problems in the textile-apparel sector; and the chemical, physical, and engineering properties of fibers, structures, and polymers. Depending on previous course work, transfer students may need one or two extra semesters to fulfill the requirements of the major.

Option I: Apparel Design
Students specializing in apparel design study both functional and aesthetic considerations in the design of body coverings. The program emphasizes a problem-solving approach that enables the student to bring a background in apparel, textiles, and human factors to the design process.

Option II: Apparel-Textile Management
Apparel-textile management combines the fields of apparel and textiles with those of economics, business management, and organizational policy. Students combine theory with case studies to find solutions to everyday problems. Course work is drawn from many interrelated disciplines, including textiles, apparel, economics, business management, and communication arts, as well as practical field experiences. This provides students with the experience of working with professionals from a wide variety of disciplines. Students often combine this option with either Option I (Apparel Design) or III (Textile Science).

Option III: Textile Science
Applications for textile structures include advanced engineering composites, protective clothing for industrial and military environments, and biomedical materials, as well as the more traditional applications found in apparel and home furnishings. The textile science option provides a strong base in mathematics and the physical sciences combined with supporting courses in engineering, consumer economics, and the social sciences.

Career Opportunities
Graduates of all programs in the Department of Textiles and Apparel have found challenging employment within the textile and apparel sector, in independent and government-sponsored research, and in community organizations. Recent graduates are working in the fields of new product development, design, and marketing management, engineering, communications, and retailing. In addition, the program also prepares students for graduate or professional study in fiber and polymer science, textile marketing, apparel design, textiles, business, and management.

Interdepartmental Major in Biology and Society
Biology and society is a multidisciplinary program for students with special interests in such problems as genetic engineering, environmental quality, food and population, the right to medical care, and the relation between biology, society, and ethics and/or public policy, as well as for students who plan postgraduate study in biology, health, medicine, law, or other related fields.
Because the biology and society major is multidisciplinary, students must attain a basic understanding of each of the several disciplines it comprises, by including introductory courses in the fields of biochemistry, chemistry, mathematics, genetics, evolution, and human development. In addition, majors are required to take core courses in biology and society, a set of electives, and a special senior seminar. Course work in the College of Human Ecology must be taken in accordance with specific concentrations: human development and the environment, health, and social policy and human services. The other basic requirements of the college must also be met. Programs incorporating these required courses are designed in consultation with a faculty adviser to accommodate each student's individual goals and interests. For further information on the major, including courses of related interest, specific course requirements, and application procedures, see the human ecology Student Guide.

Individual Curriculum

A student who has educational and professional objectives that cannot be met satisfactorily within the framework of existing majors in the College of Human Ecology may petition to develop an individual curriculum. To be approved, the curriculum must be designed in consultation with a faculty adviser to accommodate each student’s individual goals and interests. For further information on the major, including courses of related interest, specific course requirements, and application procedures, see the human ecology Student Guide.

Special Opportunities

Several special programs allow students to receive academic credit for fieldwork and internship experience, to study in abroad, or to enter particular graduate programs after the junior year.

Teacher Certification in Home Economics

Students can combine any major in the college with additional course work that leads to a certificate of qualification for teaching home economics (kindergarten through twelfth grade) in New York State and a number of other states.

Human Ecology Field and International Study

Field Study

Field study enables students to learn from participation in a community and organizational setting and from reflection on that experience through discussion, reading, and writing. This process of integrating theory with practice distinguishes field study from work experience and provides the rationale for granting academic credit.

The Human Ecology Field and International Study Office, 159 Martha Van Rensselaer Hall, offers interdepartmental, preliberal or prebusiness program as well as sound preparation for policy analyst positions in government and business or for graduate work in the premier public policy programs in the country. Policy analysis involves the combination of knowledge of the economic and political forces at work in both the private and public sectors of our society with statistical, analytical, and evaluation techniques. The economic and political knowledge and the analytical techniques are built on a broad foundation in all the social sciences. Moreover, to ensure maximum program flexibility and to provide students with the opportunity to apply general policy analysis and evaluation skills, each student builds two specific policy fields from a range of options. Consumer policy, housing policy, health policy, food and nutrition policy, environmental policy, and international development policy only begin the list of possibilities.

Public policy students also typically make use of opportunities for semester-long internships with the New York State Legislature, in one of the many federal agencies in Washington connected with the Cornell-in-Washington program, or with public or private agencies in New York City in the Field and International Study Program of the college. Advising coordinator Keith Bryant will be glad to answer questions about the advising system.

University Programs

Africana Studies and Research Center

Courses taken in the Africana Studies and Research Center (ASRC) may be used to meet some of the distribution requirements of the college. Up to two courses or 8 credits of such courses may be applied toward the 12 additional credits in natural and social sciences (section I-C of the graduation requirements) or toward the 9 additional credits in communication, analysis, and the humanities (section II-B). This allowance is in addition to the Freshman Seminar credits that may be taken in ASRC. Other courses taken in the center count as endowed division electives. A list of ASRC courses approved to meet distribution requirements or as electives is available in the Office of Student Services and in the Office of the College Registrar.

Women’s Studies

COURSES that have been approved by the faculty of the College of Human Ecology for credit are listed in the Academic Resource Center, N101 Martha Van Rensselaer Hall. Other courses may be taken for academic credit not to be taken for credit unless permission is obtained through petition to the college registrar.

Dual-Registration Programs

Johnson Graduate School of Management

A limited number of highly qualified students from Cornell undergraduate divisions, including Human Ecology, may be accepted by the Johnson Graduate School of Management after the junior year. Students need the approval of the admissions office and the registrar in the College of Human Ecology. Accepted students should be aware that the management course work taken in the junior year is in excess of the 21 additional credits allowed in the Cornell endowed divisions; they will be charged for the additional credits on a per-credit basis.

Law School

A small number of highly qualified applicants may be admitted to the Cornell Law School after only three years of undergraduate education. The requirements for admission under these circumstances are more stringent than for acceptance after four years of undergraduate study. Applicants must present outstanding qualifications and strong professional motivation. The junior-year applicant follows the ordinary application procedures for Cornell Law School admission. Interested students should contact the Law School director of admissions to discuss the extraordinary admissions criteria. Since students accepted to this program will be spending their senior year in the Cornell Law School, they need to plan ahead to ensure that distribution requirements for the B.S. degree from the College of Human Ecology will be met. Successful applicants need the approval of the college registrar.

Cornell Medical College

A limited number of highly qualified students from three Cornell divisions, including the College of Human Ecology, may be accepted by the Cornell Medical College after the junior year. To be considered for this program, the student must have completed 105 credits toward graduation by the end of the junior year. Students also need to plan ahead to ensure that distribution requirements for the Bachelor of Science degree will be met.Accepted students receive 15 credits toward the B.S. degree from their first year of study at the College of Medicine. Interested students should contact the Health Careers Program office in 203 Barnes Hall.
Off-Campus Programs

New York State Assembly Internships

A limited number of session internships with the New York State Assembly are available in spring semester to students of sophomore status and above who are enrolled in New York State colleges or universities. Human ecology students apply to the program through the student’s major department. The New York State Assembly also sponsors a summer internship. Further information about internship programs may be obtained through the Field and International Study Office, 176 Martha Van Rensselaer Hall.

Off-Campus Programs

Ithaca College

Full-time undergraduate students at Cornell may petition to enroll in courses at Ithaca College. Students pay regular tuition to Cornell and only special fees to Ithaca College, if any are charged. Students are allowed to register for one course a term and may take no more than 12 credits in four years. Exceptions will be granted to Cornell students enrolled in methods-and-practice teaching courses at Ithaca College.

Cornell students are eligible to register only in Ithaca College courses that are relevant to their program and that do not duplicate Cornell courses. Acceptance of Cornell students into Ithaca College courses is on a space-available basis. Participation in this program is not guaranteed, and Ithaca College has the right to accept or reject students for any reason it deems appropriate. The program is available only during the fall and spring semesters.

For further information students should contact the college registrar, 146 Van Rensselaer Hall.

Planning a Program of Study

Academic Advising

When students decide to major in a particular department, they are assigned to a faculty adviser by the advising coordinator in that department. The advising coordinator can help match the student’s needs with the special interests of a faculty member. Students are free to change advisers as their own interests change and should see the advising coordinator to discuss such a change. Faculty advisers and counselors in the Office of Student Services are available to discuss course requirements and sequences, and electives inside or outside the college, as well as future goals and career opportunities.

Although advisers must sign the green schedule card during course enrollment each term, it is the student’s responsibility to keep track of his or her courses and to make sure that the program meets graduation requirements for the major and the college. Advising coordinators in each department are happy to answer questions about the advising system and the undergraduate major. Students who are exploring alternative majors should work closely with college counselors who are available for planning and referral to department resource faculty.

Completing Graduation Requirements

A summary of record is kept for each student in the Office of the College Registrar. At fall registration each continuing student receives a copy showing which major and graduation requirements have already been met. It is important to check this summary and to bring any questions to the attention of staff members in the Office of the College Registrar. Although a student may complete the requirements of more than one major, he or she is officially certified to graduate under only one.

Electives

Students have individual objectives in choosing courses beyond the major program requirements of the major. The University is diverse, the departments, centers, and special programs numerous; the fields of study almost unlimited. Counselors and department advisers are available to discuss which courses may interest students and round out their educations.

Students should consult the index of this Announcement for information on where different subjects are taught in the University. Some subjects are taught in more than one division of the University.

Foreign Language Study and Placement

Students who studied a foreign language before coming to Cornell and who want to continue must take either the College Entrance Examination Board (CEEB) achievement test in that language or a departmental language placement test. The latter is given during orientation week in September and again in December, January, and May. Students in human ecology who plan to work with non-English-speaking people in this country or overseas often find it necessary to be proficient in another language. Students who wish to study abroad may find that many study abroad programs in non-English-speaking countries require the equivalent of two years of college-level language study. For more detailed information, see the section “Advanced Placement of Freshmen.”

Graduation Requirements for the Degree of Bachelor of Science

To graduate, students need to

1) meet college credit and distribution requirements,
2) complete the requirements for a major,
3) achieve a cumulative average of 1.7 (C- or better),
4) fulfill residency requirements, and
5) fulfill the physical education requirement.

College Requirements

These are the general areas of study and specific courses and credits required of every student in the college.

Graduation Requirements

I. Natural and Social Sciences (24 credits)


B. Social sciences (6 credits) selected from economics (including CEH 110, 111 but excluding Agricultural Economics 221, 310); psychology (including Education 110, 311, 317; DEA 150; HDFS 115, 116, 117; sociology (including rural sociology, CEH 148, HDFS 150). Students should not take Economics 101 and CEH 111; Economics 102 and CEH 110; or Psychology 101 and Education 110; they are equivalent courses.

C. Additional credits (12 credits) selected from any subjects listed above or from courses in anthropology (except archaeology); Astronomy 101 or 102; biochemistry; microbiology; genetics and development; Geological Sciences 101, and government.

II. Communication, Analysis, and the Humanities (15 credits)

A. Freshman Seminars (6 credits) selected from courses listed in the Freshman Seminar brochure, which may be obtained at 159 Goldwin Smith Hall.

B. Additional credits (9 credits) selected from art; communication arts; comparative literature; computer science; drawing; English; ancient or modern foreign languages; history; history of art; history of architecture; mathematics; music; Natural Resources; philosophy; statistics; students should not take both I&L 120 and Agricultural Economics 310, since the courses are substantially the same; theatre arts; DEA 101, 111, or 115; HSS 292; and selected ASRC courses (list available in the Counseling Office, N101 Martha Van Rensselaer Hall).

III. Human Ecology (40 credits)

A. Requirements for the major (the number of credits required varies by major and option).

B. Course work in at least two departments outside the major (15 credits), including at least 6 credits or two courses in one department and at least 3 credits or one course in a second department outside the major. Not more than 3 credits of the 15 may be in special studies 400, 401, 402, either departmental or interdepartmental (ID); in ID 100; or in ID 200. HE 100 cannot be used to fulfill this requirement.

IV. Additional Credits (41 credits)

A. Requirements for the major (number of credits varies from 0 to 15 credits).

B. Electives (number of credits varies from 26 to 41 credits).

Credit requirements in this section are met through courses in the state divisions of Cornell:

- College of Human Ecology (in addition to courses in sections I, II, and III)
- College of Agriculture and Life Sciences
- School of Industrial and Labor Relations
- College of Veterinary Medicine
- and through courses in the endowed divisions of Cornell:
- Africana Studies and Research Center
- College of Architecture, Art, and Planning
- College of Arts and Sciences
- College of Engineering
- School of Hotel Administration
- Johnson Graduate School of Management

Courses in the endowed divisions in this section may not exceed a total of 21 credits.

V. Physical Education (2 credits)

Students who have successfully fulfilled these requirements should have completed at least two terms of physical education in their freshman year.

Related Policies

College course requirement. Freshmen and sophomores are required to enroll in at least one course in the College of Human Ecology a semester. Students who fail to comply with this requirement will be reviewed by the Committee on Academic Status for appropriate action.

Section II. Students who receive credit from the advanced placement examination in English are still held for the Freshman Seminar requirement.

In sections I, II, and III, the required credits listed are the minimums; credits taken in excess of those minimums (section I, 24 credits; section II, 15 credits; and section III, 40 credits) count toward electives (section IV, 41 credits).

In sections I and II, courses specified by the major to meet the requirements in these sections may either be used as meeting the credit requirements in these sections or be applied toward the additional credits in section IV.

Section IV. There is no limit to the number of credits that may be taken in the state divisions of Cornell, and therefore students may choose to take additional state credits and graduate with more than 120 credits.
Credits in the endowed divisions in this section may not exceed 21. Any course taken in an endowed division for which a grade of F or U is received will be counted against the 21 allowed credits.

Elective credits earned in Cornell's endowed divisions during summer session, in absentia credits, and transfer credits are counted as credits earned in the state divisions and therefore do not count against the 21 credits allowed in the endowed divisions in meeting the requirements of this section.

Not more than 21 credits in section IV may be taken in the endowed divisions of the University except under both of the following conditions:

1) The student must have senior status (must be in the final two semesters prior to graduation).
2) Payment must be made for each credit taken in excess of the 21 allowed, whether or not the courses are passed. For the precise fee per credit, students should call the Office of the Bursar.

Related Policies for Transfer Students

Section I-A. Transfers who are entering human ecology programs in consumer economics, housing, human service planning and policy development, policy analysis, or human development and family studies can satisfy the College of Human Ecology's natural science graduation requirements with course(s) taken to meet a former college's natural science requirements as long as the course(s) transferred dealt with matter, energy, and their interrelationships and transformations. Courses in areas such as psychology and mathematics are not included, even though courses in these areas may have been taken to meet a former institution's natural science requirement.

Section II-A. Transfer students should have taken at least 6 credits in courses in English composition or in courses requiring substantial writing and offering instruction in writing equivalent to that offered in the Freshmen Seminars. Students who have not fulfilled this requirement before transferring must fulfill it at Cornell.

Section III-B. Transfer students can meet the requirement for course work outside the major in the College of Human Ecology by completion of:

1) 15 credits of work, outside their department, comprised of transfer credit and credit earned in the college, or
2) credits all taken in this college (no transfer credit is allowed to meet this requirement), on the basis of the status of the student's matriculation and prorated as follows:

- Cornell Human Ecology Credits to Satisfy Work outside the Major
- Freshman (1-25 transfer credits) 15
- Sophomore (26-55 transfer credits) 12
- Junior (56-85 transfer credits) 9
- Senior (86-120 transfer credits) 9

In both options, the courses must be in at least two departments outside the major with two courses or 6 credits in one department and at least 3 credits in a second department.

Note that transfer students are still responsible for completing a total of 40 human ecology credits under section III.

Section IV. Transferred credits for courses applied toward electives do not reduce the 21 Cornell endowed credits that students are allowed. Courses with a passing grade below C – will not transfer for a major requirement or a distribution requirement. Such courses will transfer only as elective credit.

Section V. Transfer students who have had the equivalent of two semesters of college (and therefore enter as sophomores) are not required to take physical education at Cornell, regardless of whether they took physical education at their first college. Exemption or postponement for medical reasons must be cleared by Gannett Health Center. For further information about exemption from, or postponement of, physical education, students should consult the college registrar, Joyce McAllister, in 146 Martha Van Rensselaer Hall.

Related Policies for Freshmen

Section V. Freshmen are required to take two semesters of physical education during their freshman year. Freshman transfer students entering with 12 or more credits have their physical education requirement reduced to one term.

Residency Requirements

All college curricula are planned to fit within an eight-semester program schedule of 15 credits a semester. All credits a semester (in addition to physical education) are considered standard, and if pursued for eight semesters will provide the credits needed for graduation. If the student completes all the requirements— for the major, for distribution, for total credits, and for cumulative average— in fewer than eight semesters, the degree may be conferred at the end of the semester in which the last requirements are met. Students who plan to receive their degrees early should notify the registrar at the beginning of the semester so that their summaries of record may be prepared and their names placed on the list of degree candidates.

Sometimes a student (particularly a transfer student) may need an additional semester to complete a program. To register for a semester beyond the eighth, the student submits a written request to the college registrar. The request should detail the reasons for wanting to enroll for the extra semester and include a list of courses planned for the additional semester. Such requests are usually granted when there appears to be no feasible way for the student to complete the professional curriculum or the degree requirements without the extra semester.

Freshmen entering the college with 15 transfer credits have seven semesters in which to complete the degree. Transfer students must complete at least 60 credits at Cornell.

Mature students (those at least twenty-four years old at the time of matriculation) are not required to petition the college registrar for approval to study beyond the usual eight semesters.

Exemptions from Requirements

Students who want an exemption from a specific graduation or major requirement may petition, and approval may be given under certain circumstances. Full information about the petition process is given in the human ecology Student Guide. Petition forms are available in the Office of Student Services, N101 Martha Van Rensselaer Hall.

Procedures

Course Enrollment

Students are expected to complete course enrollment during a designated period each semester. Failure to do so carries a $10 penalty, which can be waived only if circumstances are completely beyond the student's control. It is the student's responsibility to find out the dates of course enrollment.

Before or during course enrollment, students talk to a department adviser or college counselor, or both, about their program plans. Students must have their course enrollment schedule checked by their departmental major faculty adviser or by a college counselor if they have not declared a major. A listing of course changes plus directions for course enrollment are issued by the Office of the College Registrar before the start of course enrollment. Last-minute course changes are posted in that office as well as in the Counseling Office, N101 Martha Van Rensselaer Hall. Students will also need the Course and Time Roster, issued by the Office of the University Registrar each semester before course enrollment.

Since new students starting at midyear do not have an opportunity to enroll in courses until after they arrive on campus, the college tries to reserve places for them in human ecology courses. A specified time for enrolling in such courses is listed on the orientation schedule given to all new students. For the first three weeks of the term, new students have an opportunity to add courses in other divisions of the University as well as in human ecology.

Freshmen and transfer students registering for the first time in the University in the fall term enroll in their courses during the summer before they arrive on campus.

Continuing students enroll for courses for fall semester in March or April, for spring semester in October or November. All college curricula are planned to fit within an eight-semester program. An average schedule of 15 credits a semester is considered standard, and if pursued for eight semesters, the degree may be conferred at the end of the semester in which the last requirements are met. Students who plan to receive their degrees early should notify the registrar at the beginning of the semester so that their summaries of record may be prepared and their names placed on the list of degree candidates.

Permission of the Instructor

Certain courses may be taken only with the permission of the instructor, as indicated in the course descriptions. The instructor's permission must be obtained before the student enrolls in the course. After giving permission, the instructor initials the green course enrollment schedule or signs the optical-mark course-enrollment form, which can be obtained from the Office of the College Registrar or the Office of Student Services.

Students interested in taking a course in the Department of Art in the College of Architecture, Art, and Planning are required to register with the departmental secretary before enrolling in the course. Seniors who want to take an elective course in the Johnson Graduate School of Management are required to obtain permission of the instructor on a course authorization form that the student then files with that school's registrar, 312 Malott Hall.

Special Studies Courses

Each department in the College of Human Ecology offers special studies courses that provide an opportunity for students to do independent work not available in regular courses. One of these, CHE, DEA, DNS, HDFS, and Studies for Undergraduates, is intended primarily for students who have transferred from another institution and need to make up certain course work.

The other special studies courses are 400, Directed Readings; 401, Empirical Research; and 402, Supervised Fieldwork. These courses are normally taken by upperclass students, and work is supervised on an individual basis by a faculty member in the department in which the course is offered. It is important to enroll in the appropriate course number (300, 400, 401, or 402) for the special project.

Students who want to take a special studies course must talk with the faculty member under whose supervision the study would be done and then prepare a plan of work. If the faculty member agrees to supervise the study, a multicopy special studies form
must be filled out, describing the study to be pursued. Signatures of the instructor and the department chairperson as well as the student’s departmental adviser must be on the form before it is taken to the office of the college registrar, where the student will officially register for the course by filling out an optical-mark course registration form. Forms and instructions are available in the Office of Student Services.

To register in a special studies course taught in a department outside the college, students should follow the procedures established for that department.

Course Loads
The normal course load in the college ranges from 12 to 18 credits. During the course enrollment period no student may enroll for more than 15 credits or five courses, whichever is greater, without special permission from the college registrar. To receive permission, the student attaches a note to the green course schedule, citing reason(s) for carrying a heavier load, before handing it in to the Office of the College Registrar.

Credits beyond 15 may be added during the change-of-registration period at the beginning of the semester without special permission.

Students should avoid planning excessive work loads; the time required to keep abreast of courses tends to increase as the semester progresses. Courses cannot be dropped after the seventh week of classes without petitioning; so students should try to avoid the need to drop courses.

Except for those with mature-student status, students must carry at least 12 credits (exclusive of physical education). In special cases, a student may petition to carry between 8 and 12 credits. Forms for petitioning and advice on how to proceed are available from the Office of Student Services.

Except for mature students, it is seldom possible to have tuition prorated if a student carries less than 12 credits during a semester. (See the college registrar for more information.)

Students of mature status may carry 6 to 12 credits without petitioning and may have their tuition prorated. However, at the beginning of each term, mature students planning to take a light course load should pick up a proration of tuition form from the Office of the College Registrar, fill it out, have it signed by the college registrar, and return it to the bursar’s office in Day Hall.

Oversubscribed Courses
Enrollment in many human ecology courses is limited. When a course is overenrolled, students are generally notified that they have been placed on a waiting list. However, the automatic registration period on a first-come-first-served basis, without regard to seniority or other factors. Students who have any questions about the summary’s accuracy should see a counselor in the Office of Student Services or someone in the Office of the College Registrar.

Late University registration. A student who misses registration day must pay a $60 penalty during the first three weeks. The late-registration fee is increased by $25 for each additional week beyond. Late University registration is held during the first three weeks of the term. After the first week of classes, students must also have the written permission of the college registrar before they will be allowed to register in the University.

After the third week of classes, students registering late must also have the permission of the Office of the University Registrar in addition to the written permission of the college registrar and pay the appropriate late fee. After completing late University registration, students must take their college registration cards to the Office of the College Registrar, where they will then receive course-change forms and the appropriate late fee. Students who fail to register by the seventh week of the term will be withdrawn from the University. Students who want to return must reapply through the Admissions Committee.

Course Enrollment Changes

Deadlines
• During the first three weeks of the term, courses may be added or dropped without charge.
• From the fourth through the seventh week of the term, course changes may be made with the permission of the instructor and payment of a $10 processing fee.
• After the seventh week of the term, no course change may be made without petitioning for approval.

Petitions are usually granted only in circumstances beyond the student's control (for example, illness). A student petitioning for medical reasons should provide substantiating medical evidence with the petition.
• After the eighth week of the term, any student granted permission to drop a course after petitioning will automatically receive a grade of W, and the course will remain on the official transcript.
• After the third week of the term, instructors have the right to consider students' requests for course changes on an individual basis or to announce at the beginning of the term a specific date between the fourth and seventh weeks beyond which they will no longer approve course changes.

Procedures
Students who need to make course enrollment changes should make them as soon as possible. It is to the student’s advantage to add the desired courses as soon as possible, and it is helpful to other students if unwanted courses are dropped promptly.

Students should assess the work load carefully at the beginning of each term. If in the first week or two the instructors do not discuss the amount of material to be covered and the extent of assignments, students are advised to ask about course requirements.

Some of the same procedures are required for course enrollment changes, but permission of the instructor must be obtained for a course requiring it, and the same forms must be filled out for special studies courses. In addition to the procedures listed below for course enrollment changes, all course change forms for courses must be signed by the departmental faculty adviser.

Specific procedures for making course changes during the change-of-enrollment period (first three weeks of classes) are listed below. The student should:
1) Obtain an optical-mark course-change form from the Office of the College Registrar or from the Office of Student Services.
2) Fill the form out and take it to the appropriate office for signature: for human ecology courses, the forms should be taken to the Office of the College Registrar; for courses outside the college, the forms should be taken to the appropriate departmental offices.
3) Ask the person handling the class lists to add the student’s name to the list of enrolled students for a course being added or to remove his or her name from the class list for a course being dropped. That person should sign the optical-mark course-change form in the appropriate place.
4) Turn all signed forms in to the Office of the College Registrar, including the forms for out-of-college courses. Enrollment cannot be officially changed until the signed forms are filed in the registrar’s office. For example, students who fail to “cancel” a course they are no longer attending are in danger of receiving an F in the course, because they are still officially enrolled. There is no charge for course changes during the first three weeks of classes.
5) Receive a carbon copy of the course-change form at the time it is turned in. These copies are stamped with the date of receipt. It is important to keep these copies in case they are needed to verify later that the forms were filed.

A student who wants to have his or her name placed on a waiting list for a human ecology course should be aware that such lists are compiled during the change-of-course-enrollment period on a first-come-first-served basis, without regard to seniority or other factors. Students who have any questions about the summary’s accuracy should see a counselor in the Office of Student Services or someone in the Office of the College Registrar.
Students whose petitions are granted receive a letter giving them permission from the college registrar to study in absentia. Credit may be granted for study in absentia after the work has been done, but there is no guarantee that such credit will be awarded if permission has not been obtained in advance.

A $15 fee is charged to bind a student’s absence registration. If the in absentia study is undertaken during the summer, the $15 fee is charged only if the summer study is for more than 8 credits. A form is included with the letter sent to the student, giving permission to study. This form must be completed and returned to the Office of the College Registrar, 146 Martha Van Rensselaer Hall, along with a check for $15, before the student is officially registered in absentia.

Up to 15 credits may be taken in absentia as long as the work done does not duplicate courses already taken and the study is relevant to the student’s major and the requirements of the college. More than 15 credits of work in absentia may be allowed under the following conditions: (1) the work taken represents a special educational opportunity not available at Cornell, (2) it relates to the student’s particular professional goals, and (3) that goal is consistent with the focus of the college and the student’s field of study. Students must also have the approval of the college registrar, who will evaluate the program. (Forms are available in the Office of Student Services.)

If part of the work for which credit is sought is to be applied to requirements of the major, the petition will be sent to the appropriate department for approval. If credit is sought for work to be done in a modern foreign language that the student has previously studied, the approval of the Department of Modern Languages and Linguistics in the College of Arts and Sciences must be obtained.

Students are responsible for having the registrar of the institution where they study in absentia send transcripts of grades to the Office of the College Registrar at Cornell. Any credit at any institution must be in the College of Human Ecology. Credit can then be officially assessed and applied toward the Cornell degree. Only credits (not course names and grades) for study in absentia appear on the Cornell University transcript.

A student who holds a Regents’ or Children of Deceased or Disabled Veterans Scholarship may claim that scholarship for study in absentia if the study is completed in a college in New York State and if it is for a maximum of 15 credits acceptable to the College of Human Ecology.

The rules regarding study in absentia apply to transfer students with the additional stipulation that at least 60 credits must be taken at Cornell. At least 40 of the 60 credits must be in the College of Human Ecology at Cornell unless the student has transferred equivalent human ecology credit. (No more than 20 credits of equivalent credit may be applied to the 40 credits required in human ecology course work.)

Leaves of Absence

Students may request a leave of absence before the beginning of the semester for which a leave is desired or at any time during the first seven weeks of the semester. A leave may be extended for a second semester by requesting an extension in writing from the Office of the College Registrar. Students who are contemplating taking a leave of absence are urged to discuss plans with a counselor. If the student decides to take a leave of absence, a counselor will provide the necessary forms to complete, which should be taken to the Office of the College Registrar, where the official leave will be processed.

Requests for a leave of absence received after the first seven weeks of the semester, or requests for a leave of absence from students who have already had two semesters’ leave of absence, will be referred for action to the Committee on Academic Status. The committee may grant or deny such requests, attaching conditions as it deems necessary. Leaves of absence after the first seven weeks are generally granted only when there are compelling reasons why the student is unable to complete the semester, such as extended illness.

If a leave of absence is requested after the first seven weeks, students are advised to attend classes until action is taken on their petitions. A student whose petition for a leave of absence is approved may choose to withdraw or to complete the semester.

The academic records of all students who are granted a leave of absence are subject to review, and the Committee on Academic Status may request grades and other information from faculty to determine whether the student should return under warning or severe warning or in good academic standing.

Withdrawal

A withdrawal is a termination of student status at the University. Students may voluntarily withdraw at any time by notifying a counselor and the Office of the College Registrar. Students contemplating such an action are urged to discuss their plans with a counselor.

There are instances in which a student may be given a withdrawal by the Office of the College Registrar. If a student leaves the college without an approved leave of absence or does not complete the leave he or she has been granted, the student will be given a withdrawal six weeks from the end date of the semester. If the student has not completed their academic work at the time of the withdrawal, the student is required to complete the withdrawal form and return it to the office of the dean of admissions or the college registrar within seven days of the student’s leaving the campus. If a leave of absence is granted by the Office of the College Registrar, the student must submit a written request for a leave of absence, along with any necessary supporting documentation, to the office of the dean of admissions or the college registrar within seven days of the student’s leaving the campus.

A student who has withdrawn from the college or who has been given a withdrawal by the Office of the College Registrar and who wishes to return at a later date must complete the withdrawal form and return it to the office of the dean of admissions or the college registrar. The student must also have the approval of the college registrar, who will evaluate the request for readmission and provide the necessary forms to complete the process. (Forms are available in the Office of Student Services.)

Students who wish to take more than 15 credits in absentia after the grade of S or U is offered. A student may take no more than four courses (or 12 credits) on an S-U basis during his or her college career; however, more than one S-U course can be taken in one semester. S-U courses may be taken only as electives or in the 15 credits required in the college outside the major unless the requirements for a specific major indicate otherwise. Freshmen enrolled in English 137 and 138 (courses offered only on an S-U basis) are eligible to apply for these courses to the Freshmen Seminar requirement.

To take a course for an S or U, a student must first make sure, by checking the course description, that the course is offered on that basis, obtain the permission of the instructor and file a special S-U form with the instructor’s signature and the add/drop/change form in the Office of the College Registrar before the end of the fifth week of the term. After the third week of the term, students must petition the college registrar to change S-U grading status, but such petitions may not be granted. Forms are available in the Office of the College Registrar and in the Office of Student Services.

Incomplete

A grade of INC (incomplete) is given when a student does not complete the work for a course on time but, when, in the instructor’s judgment, there was a valid reason. A student with such reason should discuss the matter with the instructor and request an INC.

Beginning fall 1984, a grade of incomplete may remain on a student’s official transcript for a maximum of two semesters and one summer after the grade of incomplete is given, or until the awarding of a degree, whichever is the lesser period of time. The instructor has the option of setting a shorter time limit to complete the course work.

If the work is completed within the designated time period, the INC will be changed to a regular grade on the student’s official transcript. If the work is not completed within the designated time period, the grade of INC will be automatically converted to an F.

When a student wants to receive a grade of INC, a conference should be arranged with the instructor (preferably before classes end and the study period begins) to work out the agreement. A form, called Explanation for Reporting a Final Grade of F or Incomplete, which has been signed by both the instructor and the student, must be submitted by the instructor. This form is submitted with the final grade sheets whenever an incomplete is given.

This form is for the student’s protection, particularly in the event that a faculty member with whom a course is being completed leaves campus without leaving a record of the work completed in the course.

If circumstances prevent a student from being present to consult the instructor, the instructor may, if requested by the student, initiate the process by filing out and signing the form and turning it in to the Office of the College Registrar with the grade sheet. Before a student will be allowed to register for S-U Grades

Some courses in the college and in other academic units at Cornell are offered on an S-U basis; that fact is indicated in the course description. The regulations concerning the S-U system require that a grade of S be given for work equivalent to a C- or better; for work below that level, a U must be given. No grade-point assignment is given to S, and S or U grades are not included in the computation of semester or cumulative averages. A course in which a student receives an S is, however, counted for credit. No credit is received for a U. Both the S and U grades appear on a student’s record. A student who is attempting to qualify for the Dean’s List must take at least 12 credits for the usual A–F grades.

Only juniors and seniors may take an S-U grade in courses in which the grade of S or U is optional; however, sophomores may take courses in which only the grade of S or U is offered. A student may take no more than four courses (or 12 credits) on an S-U basis during his or her college career; however, more than one S-U course can be taken in one semester. S-U courses may be taken only as electives or in the 15 credits required in the college outside the major unless the requirements for a specific major indicate otherwise. Freshmen enrolled in English 137 and 138 (courses offered only on an S-U basis) are eligible to apply for these courses to the Freshmen Seminar requirement.

To take a course for an S or U, a student must first make sure, by checking the course description, that the course is offered on that basis, obtain the permission of the instructor and file a special S-U form with the instructor’s signature and the add/drop/change form in the Office of the College Registrar before the end of the fifth week of the term. After the third week of the term, students must petition the college registrar to change S-U grading status, but such petitions may not be granted. Forms are available in the Office of the College Registrar and in the Office of Student Services.
succeeding semesters, he or she must go to the Office of the College Registrar to fill out and sign the remainder of the form.

If the work is satisfactorily completed within the required time, the course appears on the student's official transcript, with an asterisk and the final grade received. The student in which the work was registered for the course.

A student who completes the work in the required time and expects to receive a grade must take the responsibility for checking with the Office of the College Registrar (about two weeks after the work has been handed in) to see that the grade has been received. Any questions should be discussed with the course instructor.

Academic Honors

The college encourages high academic achievement and recognizes outstanding students in several ways.

Dean's List. Excellence in academic achievement is recognized each semester by placing on the Dean's List the names of students who have completed satisfactorily, at least 12 credits with letter grades other than S or U and who have a semester grade-point average of 3.5 or above. No student who has received an F or U in an academic course will be eligible.

Omicron Nu seeks to promote graduate study and research and to stimulate scholarship and leadership toward the well-being of individuals and families. As a chapter of a national honor society in the New York State College of Human Ecology, it stimulates and encourages scholarly inquiry and action on significant problems of living—at home, in the community, and throughout the world.

Students are eligible for membership when they have attained junior status and if they have a cumulative average of not less than B. Transfer students are eligible after completing one year in this institution with a B average. Current members of Omicron Nu elect new members. Not more than 10 percent of the junior class may be elected to membership, and not more than 20 percent of the senior class may be elected. Graduate students nominated by faculty members may be elected.

Bachelor of Science with honors recognizes outstanding scholastic achievement in an academic field. Programs leading to a degree with honors are offered to selected students by the Department of Human Development and Family Studies and the Division of Nutritional Sciences. Information about admission to the programs and their requirements may be obtained from the appropriate department or division.

Bachelor of Science with distinction recognizes outstanding scholastic achievement. Consideration will be given to seniors whose academic standing at the end of seven semesters is in the top 10 percent of the graduating class. The honor is conferred on those seniors who are in the top 5 percent of the class after grade-point averages have been adjusted by including grades for transfer work and after grades earned in the fifth, sixth, and seventh semesters have been given double weighting in the final average. The graduating class includes students who will complete requirements for Bachelor of Science degrees in January, May, or August of the same calendar year.

To be eligible for consideration, transfer students must have completed at least 12 credits at Cornell. In determining the academic standing of a transfer student, previous work taken at another institution is included in the computation of the student's academic average. Names of seniors who meet these requirements are presented to the faculty of the college for approval.

Nondepartmental Course

100 Critical Reading and Thinking Fall, spring, or summer. 2 credits. Enrollment limited. Priority is given to freshmen and sophomores; juniors and seniors are admitted with permission of the instructor. S-U grades only.

Fall and spring: sec. T R 10:10 or 11:15, plus two 1-hour labs to be arranged. H. Selco.

The objective of this course is to enable students to increase critical reading and thinking abilities. Theory and research associated with a wide range of reading, thinking, and learning skills are examined. Emphasis is placed on developing and applying analytical and evaluative skills. Laboratory instruction is individualized and provides the opportunity to focus intensively on increasing comprehension, rate, and vocabulary.

Interdepartmental Courses

Field and International Study Program

D. Giles, director. K. Reardon, M. Whitham

Field Study

100 Skills for Learning in the Field Fall or spring. 2 credits. Prerequisites: permission of instructor; S-U grades optional.

First 7 weeks of semester, W 1:30—4:25. Staff.

Workshops train students in skills that will help them become more effective field learners and better able to cope with the complex demands of a field placement. Topics include cross-cultural communication, participant observation, investigative interviewing, understanding nonverbal communication, identifying sources of information in the community, and analyzing verbal presentations. All of the concepts are applied to assignments in the field.

200 Preparation for Fieldwork: Perspectives in Human Ecology Fall or spring. 4 credits. Limited to 25 students per section. Prerequisite: permission of instructor. Required of all students planning to do field study in the College of Human Ecology for interdepartmental credit.

T R 10:10—12:05 or 2:30—4:25. Staff.

Introduces students to skills essential for enrichment of field study; internships, and other experiential learning courses. This course focuses on the various cultural settings—small group, organizational, and community—that students will encounter during field study. Through a cycle of active learning and reflection, students gain experience in analysis of assumptions and biases, participant observation and interviewing skills, self-directed learning skills, effective verbal and nonverbal communication, and group dynamics. Working in small task groups, students then apply and synthesize these skills in community-based field projects. Previous semesters' projects include "Collegetown Redevelopment," "The Culture of Ithaca Commons," and "Long-term Health Care."

400 Directed Readings

For study that predominantly involves library research and independent reading.

401 Empirical Research

For study that predominantly involves data collection and analysis.

402 Supervised Fieldwork Fall, spring, or summer. 3—16 credits. S-U grades optional for up to 12 credits. Limited to 20 students. Prerequisite: ID 200. Enrollment by permission of instructor. Applications due in the Field Study Office during the preceding semester's course enrollment period.

Hours to be arranged. Staff.

Supervised field study involves both responsible participation in a community setting and reflection on that experience through discussion, reading, and writing. Academic credit is awarded for this integration of theory and practice. Credit is variable to allow for combined departmental and interdepartmental sponsorship and supervision.

Information on placement opportunities is available in the Field Study Office. 159 Martha Van Rensselaer Hall. Students should begin planning at least a semester in advance for field study.

403 Teaching Apprenticeship

For study that includes assisting faculty with instruction.

406 Sponsored Field Learning or Internships

Fall or spring. 6—12 credits. S-U grades optional for up to 12 credits. Limited to 15 students. Intended for juniors and seniors. Prerequisite: ID 200. Enrollment by permission of instructor. Applications are due in the Field Study Office during the preceding semester's course enrollment period.

Hours to be arranged. D. Giles.

A course for students seeking interdepartmental sponsorship and supervision of participation in structured, off-campus field experiences or internships operated by non-Cornell or non-credit-granting institutions or agencies. Examples include the New York State Assembly Internship Program, the Washington Center, and internships arranged independently by students with individual organizations or institutions. Field supervision, largely carried out through biweekly correspondence, is aimed at complementing students' work-study assignments while they are on their internships and at enabling students to gain an in-depth understanding of how their internship organization operates and the internal and external social ecological forces that influence it. Completion of course requirements is signified by a formal presentation to the college community upon return to Cornell (graduating seniors may make special arrangements). Credit is variable to allow students to arrange for combined interdepartmental and departmental sponsorship and supervision.

Information on course enrollment and internship opportunities is available in the Field Study Office. 159 Martha Van Rensselaer Hall. Students should begin planning more than one full semester before leaving campus for an internship.

407 Field Experience in Community Problem Solving

Fall or spring. 6—15 credits. Limited to 25 students; intended for juniors or seniors. Prerequisite: ID 200. Enrollment by permission of instructor. Applications due in the Field Study Office during the preceding semester's course enrollment period. Not offered 1986—87.

Sem. II: 1:30—4:25; hours in the field to be arranged. M. Whitham.

A course designed to provide students with a structured, closely supervised field experience emphasizing an ecological approach to human problems. Interdepartmental teams of from two to five students will contract with community businesses, agencies, and organizations as special-projects staff members delegated primary responsibility for problem solving in a designated area of agency need. Students spend twenty hours each week working directly on the projects, three hours each week in seminar, and additional time completing seminar readings and assignments. The seminar is aimed at assisting students in systematically analyzing the complex factors that affect the implementation of new programs, policies, or projects in upstate community settings. Set in this context, the field placement is viewed as a case study in the ecology of organizational decision making. Supervision of all projects is provided jointly by the course instructor and appropriate agency personnel. In addition, each project is subject to review twice during the semester by an oversight committee composed of agency representatives with relevant expertise. Completion of the course is signified by formal presentation of project results to the contracting organization's staff, board of directors, or other appropriate administrative
The course has two main objectives. One is to prepare students for international and cross-cultural experience through the application of observation and interviewing skills, analysis of social and cultural factors in selected countries, and consideration of key issues such as poverty, inequality, industrialization, and class and gender exploitation; the second is to link social factors to the use and distribution of natural resources and to provide a framework for understanding the social control of resources and its effects on the life chances, choices, and experience of people. Class activities include discussion, lectures, field experiences, skill development, and a small-group presentation. Students will develop internships and observation skills through projects that will focus on the countries in which they intend to study or intern. Strongly recommended for students planning to study abroad, to do international internships, or to take ID 410.

410 Advanced Seminar: Analysis of International Experience Fall or spring. 3 credits. Prerequisite: experience abroad and permission of instructor.

This course provides a context for the integration and interpretation of cross-cultural experience for students returning to the United States after extended periods abroad. Building on an understanding of international processes shaping and directing an interdependent world, the course relates personal experience to socioeconomic factors structuring living situations at home and abroad. Among the issues to be pursued are re-entry (re)adjustment, selection and choices, and the meaning of sponsorship and supervision.

The course will feature readings, special projects, presentations, and discussions encouraging and facilitating the analysis and understanding of individual cross-cultural experience. The purpose of the course is to encourage the analysis and integration of cross-cultural experience in relation to international processes, academic interests, and personal concerns of students.

Consumer Economics and Housing Courses


110 Introduction to Consumer Economics I Fall. 3 credits. S-U grades optional. Students who have taken Economics 101 or another introductory microeconomics course should not register for this course.

M W F 9:05. P Zorn.

Principles of microeconomics with an emphasis on applicability to consumers. The course acquaints students with the basic economic models of household and firm behavior and their interaction in markets. The goal is to provide students with the ability to analyze the economic implications of consumer decisions and public policies.

111 Introduction to Consumer Economics II Spring. 3 credits. S-U grades optional. Students who have taken Economics 102 or another introductory microeconomics course should not register for this course.

M W F 11:15. J. Robinson.

Principles of microeconomics with an emphasis on the relevance of economic policies to consumers and household decision-making processes. Topics include national income accounting, aggregate demand and aggregate supply, the role of monetary and fiscal policy in confronting the problems of inflation and unemployment, and international economics.

Economics of the Household

M W F 9:05. W. K. Bryant.

Theories and empirical evidence of how households spend their resources are used to investigate the ways in which family size, age composition, and life cycle stage affect the use of income, and how these factors condition the household's use of its financial resources.
For study that predominantly involves library research

401 Empirical Research
Prerequisites: one course in sociology. Recommended: CEH 110 or equivalent.
S-U grades optional.

Time as a Human Resource
Fall. 3 credits. Prerequisites: one course in sociology. Recommended: CEH 110 or equivalent.

413 An Ecological Approach to Family Decision Making
Spring. 3 credits. Limited to 20 students; not open to freshmen; preference given to juniors and seniors. Recommended: CEH 312 or equivalent.
S-U grades optional. Offered alternate years.

430 The Economics of Consumer Policy
Fall. 3 credits. Open to juniors, seniors, and graduate students. Prerequisites: CEH 110 or equivalent.
S-U grades optional. Offered alternate years.

431 Consumer Behavior
Fall. 3 credits. Open to seniors and graduate students. Prerequisites: CEH 110 or equivalent.
S-U grades optional. Offered alternate years.

432 Economic Organization of the Marketplace
Fall. 3 credits. Prerequisites: CEH 110 or equivalent.
S-U grades optional. Offered alternate years.

449 Housing Problems and Policies: A National Perspective
Spring. 3 credits. Prerequisites: CEH 110 or equivalent. Recommended: CEH 341. S-U grades optional.

450 Economics of Health, Health-Care Expenditures, and Health Policy
Spring. 3 credits. Prerequisites: CEH 110 or equivalent. S-U grades optional.

[443 Social Aspects of Housing and Neighborhood
M W F 11:15. Staff.

The relationship between housing and social behavior and organization is examined. Levels of analysis include the physical features of housing that influence human behavior and the quality of life; the housing conditions of neighborhoods and the congruency between local housing and population composition, patterns of interaction, and the physical dimensions of community; housing as an expression of the structure of family life; and housing as a bundle of property rights that confer or deny political rights, local stature, and citizenship and provide more or less control over one’s life.

444 Housing for the Elderly
Spring. 3 credits. Prerequisites: CEH 247 or permission of instructor. S-U grades optional. Offered alternate years.

448 Housing and Local Government
Fall. 3 credits. Prerequisite: CEH 110 or equivalent. S-U grades optional.

465 Economics of Consumer Law
Spring. 3 credits. Prerequisite: CEH 110 or equivalent. S-U grades optional.

A seminar based on historical and contemporary readings. Examines and explores time management concepts and applications. Investigates changes in time use of family members in relation to social change. Explores meanings of work market, household work, and leisure in the context of family choices at different stages of the life cycle. Investigates current research concerning the allocation of family members to household and market work. Examines use of time as a measure of household activities and production.]


This course is designed to provide students with the economic skills required to understand housing markets, problems, and policies. Microeconomic theory will be used to develop a model of household and firm behavior. This model provides the framework for an analysis of empirical studies by housing economists. Topics will include the tenure-mobility decision, estimation of the supply and demand for housing, the effects of inflation and the income tax system on the housing market, and the treatment of housing as a heterogeneous durable good.

355 Wealth and Income
Spring. 3 credits. Open to sophomores, juniors, and seniors; graduate students may elect to audit and write a research paper for 1 to 2 credits under CEH 247. Prerequisites: CEH 110–111 or equivalent.
S-U grades optional.

A study of the health-care market as distinguished from the health-care delivery system and its role in the consumer welfare. Topics include the physical features of housing that influence human behavior and the quality of life; the housing conditions of neighborhoods and the congruency between local housing and population composition, patterns of interaction, and the physical dimensions of community; housing as an expression of the structure of family life; and housing as a bundle of property rights that confer or deny political rights, local stature, and citizenship and provide more or less control over one’s life.

This course focuses on the housing needs of the elderly, their current housing conditions—living arrangements, tenure patterns, housing quality and housing expense burden—and socioeconomic and psychological aspects of the housing environment of the elderly. Attention is also given to government housing programs for the elderly, integrating housing and related social service activities, and options for alternative housing.

449 Housing Problems and Policies: A National Perspective
Spring. 3 credits. Prerequisite: CEH 110 or equivalent. Recommended: CEH 341. S-U grades optional.

This course addresses the role of the federal government in the housing market and reviews the hierarchy of development of federal and state programs. Current housing problems and policies, including direct-subsidy schemes, the tax treatment of housing, the impact of economic fluctuations on the housing market, and the problems associated with housing finance are critically analyzed.

[450 Economics of Health, Health-Care Expenditures, and Health Policy

A study of the health-care market as distinguished from other markets because of the relative information disadvantage on the part of the consumer. Topics include a theoretical and institutional analysis of the health-care system and its role in the consumer decision-making process, conflicts of interest between institutional objectives of health-care providers and public and private health-care insurers as they relate to inefficient provision of medical services, and the role of government intervention and alternative systems of medical care provision in reducing medical costs and in increasing accessibility.

465 Economics of Consumer Law
Spring. 3 credits. Prerequisite: CEH 110 or equivalent. S-U grades optional.


A study of the health-care market as distinguished from other markets because of the relative information disadvantage on the part of the consumer. Topics include a theoretical and institutional analysis of the health-care system and its role in the consumer decision-making process, conflicts of interest between institutional objectives of health-care providers and public and private health-care insurers as they relate to inefficient provision of medical services, and the role of government intervention and alternative systems of medical care provision in reducing medical costs and in increasing accessibility.]
as of the activities of such agencies as the Federal Trade Commission, the Food and Drug Administration, and the Consumer Product Safety Commission.

485 Evaluation of Public Policies Fall. 3 credits. Prerequisite: an intermediate microeconomics course. Recommended: an introductory statistics course. M W F 10:10. J. Reschovsky. This course provides an introduction to the techniques used to evaluate public policies and programs. It will begin with a review of basic concepts in evaluative research; causal inference, validity, and experimental and quasi-experimental designs. The remainder of the course will concentrate on the tools of cost benefit analysis as a device for evaluating the effectiveness of government programs. Emphasis will be given to the techniques, issues, and problems of cost benefit analysis will be highlighted by examples of its use in a variety of public policy areas. Economic analysis and statistical techniques will be emphasized.

600 Special Problems for Graduate Students Fall and spring. S-U grades optional. Hours to be arranged. Staff. Independent advanced work by graduate students recommended by their chairperson and approved by the head of the department and the instructor.

601 Research Workshop in Consumer Economics and Housing Fall and spring. 1–3 credits. S-U grades only. Hours to be arranged. Staff. Research seminar designed to provide a forum for graduate students in consumer economics and housing to present their own thesis research at an early stage and to provide critical input for other graduate students.

602 (612) Family Resource Management Concepts Fall. 3 credits. Prerequisite: graduate standing. M T R 8:30–9:55. A. Davey. A study of the basic concepts and the development of conceptual frameworks in family management.

603 (626) Economics of Consumer Demand Fall. 3 credits. Prerequisite: Economics 311 or 313 or concurrent enrollment in either. S-U grades optional. M W F 10:10. J. Gerner, P. Zott. Introduction to the graduate level to theory and empirical research on household demand, consumption, and savings. Particular attention is paid to problems associated with the demand for consumer durables, with applications to housing.


605 (628) Information and Regulation Spring. 3 credits. Prerequisite: CEH 603. W 12–2. G. S. Whetten, S. White. A survey of the problems and policies accompanying informational failures and other market failures with regard to consumer well-being. Governmental regulation of products, of producers, of consumers, and of prices is examined. Antitrust activity, disclosure requirements, advertising restrictions, and regulatory agencies are examined in terms of their ability to serve the public interest or to serve special interests. Economic analysis, rather than institutional structure, is emphasized.

640 Fundamentals of Housing Fall. 3 credits. Prerequisite: graduate standing or permission of instructor. S-U grades optional. M W 2:30–3:45. P. Chi. An introductory survey of housing as a field of graduate study. Consideration of the spatial context and institutional setting of housing, the structure and performance of the housing market, housing finance, the house-building industry, the nature and impact of government programs, and the social and economic effects of housing regulations.

648 Household and Family Demography Spring. 3 credits. Prerequisite: graduate standing or permission of instructor. S-U grades optional. Offered alternate years. M W F 2:30. Staff. This course is concerned with the size and composition of households and families; their variation among nations and between subgroups within the nation; changes over time, including both secular trends and change over life cycle; the determinants of change and variation; and the economic consequences of household variation and change, such as influences on residential mobility and housing adjustments, impacts of family structure on fertility, implications of family composition for female labor-force participation, and effects of household and family structure on economic behavior.

714 (614) Readings in Family Decision Making Fall or spring. 3 credits. Recommended: a course in family management (preferably CEH 602) and a course in family sociology. S-U grades only. M W F 10:10. J. Reschovsky. Family decision making is studied from the perspective of decision processes, behavior of decision makers, and decision context. The relationship of decision making to family management is also explored.

715 (615) Family Financial Management Spring. 3 credits. Prerequisites: introductory statistics course, CEH 316 or equivalent, and CEH 602. S-U grades optional. Offered alternate years. Not offered 1986–87; next offered 1987–88. W 2–4:25. R. Heck. The study of management theory applied to the financial dimension of the household. Resource use is examined, emphasizing financial resources such as income, expenditures, savings, credit, and investments. A critical examination of current theories in the area of management and a survey of literature in the fields are included.


727 Family Economics Fall. 3 credits. Prerequisite: permission of instructor. Recommended but not required. CEH 411. S-U grades optional. Offered alternate years. M W 11:10. J. Gerner. This course examines the public sector policies that influence family time-allocation decisions. Particular attention will be given to the time allocated by female family members to non-household activities and how these activities are influenced by outside economic forces and by internal family characteristics. Family demography is also examined.

742 (642) Housing in an Urban Context Spring. 3 credits. Prerequisite: Economics 311 or equivalent. S-U grades optional. Offered alternate years. M W F 10:10. J. Reschovsky. An examination of housing issues from a micro-economic perspective. The course first establishes a context for the study of housing by briefly exploring economic theories of the structure of urban environments. The supply, demand, and market equilibrium of housing are then considered along with special topics on rent control, filtering, and discrimination. The local government perspective is introduced by considering the issues of zoning and land-use controls, suburbanization sprawl, and property taxation.

Design and Environmental Analysis Courses

W. R. Sims, chairman; F. D. Becker, graduate faculty representative; M. Boyd, undergraduate advising coordinator; R. Beckman, A. Bushnell, S. Danko, P. Ehstelman, C. E. Garner, A. Hedge, J. LaQuatra, G. C. Millican, E. R. Ostrander.

101 Design I: Fundamentals Fall or spring. 3 credits. Each section limited to 18 students. Priority given to DEA majors. Option I majors should take DEA 101 in fall. Approximate cost of materials, $60. Fall: M W F 10:10–1:10; spring: M W 1:25–4:25. M. Boyd. A studio course introducing the fundamental vocabulary and principles of design. Students experiment with the development of form through problem-solving approaches.

102 Design II: Fundamentals Spring. 3 credits. Each section limited to 18 students. Priority given to interior design majors. Prerequisite: DEA 101. Option I majors should take DEA 102 and DEA 115 concurrently in spring. Approximate cost of materials, $50; shop fee, $10.

M W 1:25–4:25. M. Boyd, A. Bushnell. A studio course in three-dimensional design with an interior design emphasis. Problems in spatial organization are explored through drawings and models.

111 Introduction to Design Spring. 3 credits. M W F 11:15. R. Beckman. Introduction to the field of design for the student in any academic area. The course reviews the spectrum of design activities, examining various movements in the visual arts and differences among designers in philosophical premises, social and functional roles, and cultural positions. Also examined are requirements in the man-made environment as affected by the interaction of people, design, and materials. Lectures and visual material are presented by DEA faculty members and visiting design professionals.

115 Drawing Fall or spring. 3 credits. Each section limited to 18 students. Fall section offered for nonmajors; priority given to DEA majors in the spring. Option I majors strongly encouraged to take DEA 102 and DEA 115 concurrently in spring. Minimum cost of materials, $50. T R 10:10–1:10. Staff. A studio drawing course for designers. Discussion groups on the drawing techniques are held to develop a
visual understanding and vocabulary. The student is introduced to the functions of line, shape, and value. Perspective, spatial, and conceptual drawing are emphasized.

117 Drawing the Clothed Figure  Spring. 3 credits. Enrollment limited to 18 students. S-U grades optional. Approximate cost of textbook: $32; minimum cost of supplies: $40.
To improve the student's ability to illustrate two-dimensionally the interaction of draped fabric and the human form and to develop awareness of the design medium. Emphasis is on the development of techniques and skills in selected media necessary for the communication of design ideas.

150 Introduction to Human-Environment Relations Fall. 3 credits.
Introduction to influence of physical environment on human behavior. Topics include environmental influences on crowding, community, crime, and friendship; environmental needs associated with characteristics such as stages in life cycle, life styles, social classes, and handicaps; person-environment fit for lighting, acoustics, and thermal comfort, introduction to human factors and systems analysis; effects of environment on perception-cognition; user-responsive design; participatory design programming; and postoccupancy evaluation.

201 Design III: Basic Interior Design Fall. 5 credits. Each section limited to 18 students.
Prerequisites: DEA 101 and 102 and a 3-credit drawing course (DEA 115 strongly recommended).
Coregistration in DEA 203 is required. Recommended: DEA 111 and 150. Minimum cost of materials, $120; shop fee, $10; optional field trip, approximately $60; diazo machine fee, $8.
A. Bushnell, P. Eshelman.
Beginning interior design studio. Focus is on development of basic proficiency in design skills. The course is structured around a series of elementary interior and interior-product design problems of 3 to 5 weeks in length.

202 Design IV: Basic Interior Design Spring. 5 credits. Each section limited to 18 students.
Prerequisites: DEA 201 and 203. Prerequisite or corequisite: DEA 111, 150, and 304. Minimum cost of materials, $120, diazo machine fee, $8.
A. Bushnell, P. Eshelman.
Second interior design studio. Emphasis of the course is on continued development of basic proficiency in design skills through exposure to a selected set of interior and interior-product design problems of limited complexity. Each problem of 3 to 5 weeks duration is structured to emphasize different aspects of the design process.

203 Design Communications Fall. 1 credit.
Enrollment limited to 40 students. Priority given to DEA Option 1 majors.
Communication to the interior designer. Focus is on a selected set of representational techniques useful to designers in understanding and developing design proposals during the design process, and on communicating interior design proposals to clients and users. Plans, sections, perspectives, isometrics, rendering techniques, models and model photography, and techniques for presentations of design proposals to audiences will be covered.

204 Introduction to Building Technology Spring. 1 credit.
Introduction to building technology for interior designers and facility managers. Emphasis is placed on developing basic understanding of buildings and building systems and their implications for interior design and facility management. Covers basic building types; structural systems; construction materials and methods; HVAC systems; plumbing, electrical, lighting, fire, and security systems; computer, and other communication systems.

250 The Environment and Social Behavior Fall. 3 credits. Prerequisite: DEA 150 or permission of instructor.
M W 10:10-12:05. F. Becker.
A combination seminar and lecture course for students interested in the social aspects of design. Exercises study environmental form influences on social behaviors such as aggression, cooperation, community, and crime. Also covered are the influence of stage in life cycle, family structure, and social class on environmental needs and purposes. Implications for the planning, design, and management of complex environments such as offices, hospitals, schools, and housing are emphasized.

251 Historic Design I: Furniture and Interior Design Fall. 3 credits. Prerequisites: DEA 101 and 111. Recommended sequence: DEA 115, 252, and 353.
A study of the patterns of historical development and change in architecture, furniture, and interiors from man's earliest expressions to the present as they reflect the changing cultural framework of Western civilization, excluding America.

261 Fundamentals of Interior Design Fall. 3 credits. Enrollment limited to 20 students. Intended for nonmajors but open to DEA majors. Minimum cost of materials, $30.
A studio course that emphasizes the fundamental principles of design applied to the planning of residential interiors and coordinated with family and individual needs. Studio problems explore choices of materials, space planning, and selection and arrangement of furniture, lighting, and color, illustrated lectures, readings, and introductory drafting and rendering techniques are presented.

300 Special Studies for Undergraduates Fall or spring. Credit to be arranged.
Hours to be arranged. Department faculty Special arrangement for course work to establish equivalency for courses not transferred from a previous institution or students in study abroad and to earn specific credits. May be repeated for credit up to 12 credits.

301 Design V: Intermediate Interior Design Fall. 5 credits. Prerequisites: DEA 111, 150, 201, 202, 203, and 204. Corequisite: DEA 303. Recommended: DEA 459. Minimum cost of materials, $120; shop fee, $10; optional field trip, approximately $60; diazo machine fee, $6.
S. Danko.
Intermediate-level interior design studio. The course is organized around a series of interior and interior-product design problems of intermediate-level complexity, 3 to 5 weeks in duration. Focus is on development of design skills and on understanding of a selected set of generic problem types.

302 Design VI: Intermediate Interior Design Spring. 5 credits. Prerequisites: DEA 301 and 303. Corequisite: DEA 304. Minimum cost of materials, $120; shop fee, $10; diazo machine fee, $8.
R. Beckman.
Second-semester, intermediate-level interior design studio. Continued emphasis on development of design skills and an exposure to generic problem types.

303 Introduction to Furnishings, Materials, and Finishes Fall. 1 credit.
Basic understanding of furniture types and systems; interior products and equipment such as work-stations; window, wall, and floor coverings; ceiling and lighting systems; and materials and finishes. Emphasis is placed on criteria for selection of furnishings, materials, and finishes for typical interior design and facility management problems.

304 Introduction to Professional Practice of Interior Design Spring. 1 credit.
Introduction to organizational and management principles for delivery of interior design and facility management services. Covers basic organizational structures and basic management functions within interior design and facility management organizations, work flow and scheduling, legal responsibilities and concerns, contracts, basic contract documents such as drawings and specifications, supervision of construction and installation, and cost estimation.

325 Human Factors: Ergonomics-Anthropometrics Spring. 3 credits. Prerequisite: 3-credit statistics course. Recommended: DEA 150.
A studio course dealing with the functional and decorative aspects of environmental graphics. Includes projects in interior and exterior graphics, signing, and directional systems.

348 Environmental Graphics and Signing Spring. 3 credits. Enrollment limited to 20 students. Priority given to DEA majors. Approximate cost of materials, $50.
A studio course dealing with the functional and decorative aspects of environmental graphics. Includes projects in interior and exterior graphics, signing, and directional systems.

349 Graphic Design Spring. 3 credits. Enrollment limited to 20 students. Priority given to DEA majors. Approximate cost of materials, $50.
The fundamentals of lettering, typography, layout, and production techniques. Printing processes and the application of photography and illustration are also covered. A series of projects explore problems typical to the graphic design field.

350 Human Factors: The Ambient Environment Fall. 3 credits. Recommended: DEA 150.
An introduction to human-factor considerations in lighting, acoustics, noise control, and the thermal environment. The ambient environment is viewed as a support system that should promote human efficiency, productivity, health, and safety. Attention is given to the needs of special populations such as the elderly. Emphasis is placed on the implications for planning, design, and management of settings and facilities.

353 Historic Design III: Contemporary Design Spring. 3 credits. Recommended sequence: DEA 251, 252, and 353.
A historical study of the emergence and development of contemporary design, 1885 to the present. Examines the social, economic, technical, and stylistic forces that shape the design forms of contemporary design and includes a critical analysis of selected works of furniture, fabrics, and interiors.

361 Residential Design Spring. 3 credits. Approximate cost of materials, $30.
An introduction to residential architectural design. While designing a solution for specific occupant needs, students consider site, orientation, climate, and materials. Drafting work consists of plans, elevations, perspectives, and presentation of solutions. Lectures, discussions, and required readings.

400-401-402 Directed Study

11 Special Studies for Undergraduates

Fall or spring. Credits to be arranged. S-U grades optional.

Hours to be arranged. Department faculty.

For advanced independent study by an individual student or for study on an experimental basis with a group of students in a field of DEA not otherwise provided through course work in the department or elsewhere at the University. Students prepare a multiplicity description of the study they want to undertake, on a form available from the Counseling Office. This form must be signed by the instructor directing the study and the department chairman and filed at course registration or within the change-of-registration period after registration. To ensure review before the close of the course registration or change-of-registration period, early submission of the special-studies form to the department chairman is necessary. Students, in consultation with their supervisor, should register for one of the following subdivisions of independent study:

400 Directed Readings

For study that predominantly involves library research and independent reading.

401 Empirical Research

For study that predominantly involves data collection and analysis, or laboratory or studio projects.

402 Supervised Fieldwork

For study that involves both responsible participation in a community setting and reflection on that experience through discussion, reading, and writing. Academic credit is awarded for this integration of theory and practice.

403 Teaching Apprenticeship

For study that includes teaching methods in the field and responsibilities associated with instruction. Students must have demonstrated a high level of performance in the subject to be taught and in the overall academic program.

455 Research Methods in Human-Environment Relations

Fall. 3 credits. Prerequisite: DEA 150 or permission of instructor, and a statistics course. M W F 9:05. E. Ostrander.

The course develops students' understanding and competence in the use of research and analytical tools to study the relationship between the physical environment and human behavior. Emphasis is placed on selection of appropriate methods for specific problems and the policy implications derived from research. Topics include research design, unobtrusive and obtrusive data-collecting tools, the processing of qualitative and quantitative data, and effective communication of empirical research findings.

459 Programming Methods in Design

Spring. 3 credits. T R 10:10–11:30. E. Ostrander.

Introduction to environmental programming. Emphasis on formulation of system requirements from user characteristics and limitations. Different methods for determining characteristics required of a particular environmental setting (in order that it support desired behaviors of users and operators) include systems analysis, behavior circuits, behavior settings, and user characteristics. Selection of appropriate methods to suit problems or creation of new methods or techniques is emphasized.

468 Design Theory Seminar

Fall. 3 credits. T R 10:10–11:30. R. Beckman.

Directed toward advanced undergraduate and graduate students with interest in the theory of design. The purpose is to provide an understanding of major theoretical ideas underlying design movements of the twentieth century. Explores these ideas through readings, lectures by faculty and visitors, student presentations of research papers, and seminar discussions.

499 Design VII: Advanced Interior Design

Fall and spring. 1 credit. A student enrolled in DEA 499 must be for a minimum of 4 credits. Students may elect to take 4 additional credits, to be taken concurrently or in a subsequent semester. Students are strongly encouraged to satisfy the basic 4-hour DEA 499 requirement in the fall semester and to continue with an additional 4-hour studio in the spring semester. Prerequisites: DEA 301, 302, 303, and 304. DEA 302 and 499 may not be taken concurrently. DEA 640 cannot be taken for 499. Minimum cost of materials, $120; diazo machine fee, $8 per semester.


A comprehensive design-problem-solving experience involving completion of an advanced interior design problem selected by the student and approved by the instructor. The course consists of four phases of three to five weeks each: programming, schematic design and evaluation, design development, including material and finish selection; design detailing, and in-process documentation and the preparation of a professional-quality final presentation.

600 Special Problems for Graduate Students

Fall or spring. Credit to be arranged. S-U grades optional.

Hours to be arranged. Department faculty.

Independent advanced work by graduate students recommended by their chairperson and approved by the head of the department and instructor.

645 Design Process and Methods

Spring. 3 credits. Enrollment limited to 15 students. M W F 8:30–9:55. S. Danko.

Will focus on thinking processes and techniques that support creative problem solving. Design methodologies for specific designers will be examined through discussions and applications to short studio problems by the students. Topics include a historical overview of the design process and methods in both professional practice and education. The effect of technology on design thinking and the inherent merits and pitfalls in the four realms of thinking (analytical, intuitive, synthetic, and evaluative) will be discussed.

650 Programming Methods in Design


A course intended for graduate student who wants a more thorough introduction to environmental programming methods than is provided by DEA 459. Each student is required to attend DEA 459 lectures, meet with the instructor and other graduate students for an additional class each week, and do additional readings and projects.

653 Psychology and Office Design

Spring. 3 credits. Prerequisite: DEA 250 or permission of instructor. M W F 8:30–9:55. F. Becker.

Intended for students interested in the planning, design, and management of complex organizations. The purpose is to explore how characteristics of the office, including furniture and equipment and policies governing their use and allocation, affect individual and organizational effectiveness. Special topics, such as the human implications of new information technologies and work at home, are also covered.

654 Facility Planning and Management Studio

Spring. 4 credits. Prerequisite: permission of instructor. Letter grades only. Minimum cost of materials, $100. M W 2:30–5:30. W. Ostrander.

For graduates and advanced undergraduates interested in facility planning and management. Purpose is to provide basic tools, techniques, and concepts useful in the planning, design, and management of complex facilities. Covers development and implementation of space standards, space allocation policies, space forecasting, facility change, space planning and design, furniture specifications, and moves. Social-psychological, organizational, financial, architectural, and legal factors are considered.

656 Research Methods in Human-Environment Relations

Fall. 4 credits. Prerequisites: DEA 150 or permission of instructor, and a statistics course. Letter grades only. M W F 9-9:50, plus hour to be arranged. E. Ostrander.

The course develops the graduate student's understanding and competence in the use of research and analytical tools to study the relationship between the physical environment and human behavior. Students attend DEA 455 lectures but have more extensive readings and projects and meet an additional hour each week.

659 Seminar on Facility Planning and Management

Fall. 3 credits. Prerequisite: DEA 150 or permission of instructor. M W 10:10–12:05, plus hour to be arranged. F. Becker.

A combination seminar and lecture course for graduate students with interests in social sciences or design. Graduate students attend DEA 250 lectures but have more-extensive readings and meet an additional hour each week.

899 Master's Thesis and Research

Fall or spring. Credits to be arranged. Prerequisite: permission of the chairperson of the graduate committee and the instructor. S-U grades optional. Hours to be arranged. Department graduate faculty.

Human Development and Family Studies Courses


111 Observation


An overview of methods of observing people and the situations in which they behave, in order to develop observational skills, increase understanding of behavior and its development, and acquaint students with basic conceptual methods underlying the scientific study of human behavior. A week of field observation in applying observational methods in laboratory and real-life settings is emphasized. Discussion groups accompany the observation experience.

115 Human Development: Infancy and Childhood

Fall or summer. 3 credits. S-U grades only. M W F 11:15-12:05. S. Ceci.

Provides a broad overview of theories, research methods, and the status of scientific knowledge about human development from infancy through childhood.
Attention is focused on the interplay of psychological factors, in changing behavior and shaping the individual's perceptual, linguistic, neurophysiological, social, and cognitive development.

150 Families in Modern Society Spring or summer. 3 credits. S-U grades optional. Students cannot receive credit for both HDFS 150 and Sociology 243. M W F 1:25. M. Thorn. Contemporary family roles and functions are considered as they appear in United States history, as they change in the life course, and as they are influenced by cultural and economic forces that impinge on them.

216 Adolescence and Youth: Biological and Cognitive Development Spring, weeks 1–7, or summer. 2 credits. Prerequisite: psychology or sociology course. S-U grades optional. M W F 10:10–10:55. J. Birth. A course giving an overview of basic research and theory on pubescence and cognitive development during adolescence and youth and how they affect an individual's personality and social development. Major issues discussed include the psychosocial significance of pubescence, the nature of adolescence as a point in the life course, and adolescent identity.

217 Adolescence and Youth: Personality and Social Development Spring, weeks 8–15, or summer. 2 credits. Prerequisite: psychology or sociology course. S-U grades optional. M W F 11:00–11:55. S. Byth. A course giving an overview of basic research and theory on an individual's personality and social development during adolescence and youth. The role of family, peers, school, and work contexts during adolescence is emphasized. Major issues discussed include autonomy, intimacy, achievement, and problem behavior.

218 Adulthood and Aging: Personality and Social Development Fall, weeks 1–7, Spring, weeks 8–15. 2 credits. Prerequisite: psychology or sociology course. S-U grades optional. M W F 12:00–12:55. S. Corneliussen. This course provides a general introduction to theories and research on adult development and aging. Change and continuity in personality from youth through late adulthood are discussed. Transitions in familial and occupational roles and interpersonal relationships are examined from a life-course perspective.

219 Adulthood and Aging: Biological and Cognitive Development Fall, weeks 1–7, Spring, weeks 8–15. 2 credits. Prerequisite: psychology or sociology course. S-U grades optional. M W F 2:30–3:20. S. Corneliussen. This course provides a general introduction to theories and research on adult development and aging. The course emphasizes biological and cognitive changes during adulthood. Topics examined include physical health, disease, and longevity; issues in long-term care and institutionalization; and changes in cognitive processes involving sensation, perception, memory, thinking, and intelligence.

243 Participation with Groups of Children Ages Six through Twelve Fall or spring. 4 credits (3 credits with permission of instructor). Limited to 20 students (limit depends on availability of placements and of supervision). Prerequisite: HDFS 115. Recommended: HDFS 111 or ID 100. S-U grades optional. M W 10:10–12:05, plus two half-days of fieldwork (for 4 credits) or one half-day of fieldwork (for 3 credits). S. West. A field-based course designed to combine experience in child-care centers with theory and supervision, intended to develop the student's ability to understand and relate effectively to young children. Course structure integrates lectures and discussions, workshops, films, projects, reading, writing, and sharing of field experiences. Students are placed in local nursery schools, day-care centers, Head Start programs, and kindergartens.

258 Historical Development of Women as Professionals, 1500 to 1980 (also Women's Studies 238 and Sociology 238) Fall. 3 credits. S-U grades optional. Human ecology students must register for HDFS 258. T R 10:10–11:40. J. Brumberg. The historical evolution of the female professions in America (midwifery, nursing, teaching, librarianship, prostitution, home economics, and social work) as well as women's struggles to gain access to medicine, law, the clergy, and the academy. Consideration of history of women in medicine and law as well. Lectures, reading, and discussion are geared to identifying the cultural patterns that fostered the conception of gender-specific work and the particular circumstances that created these different work opportunities. The evolution of "professionalism" and the consequences of professional organization for women, family structures, and American society is also discussed.

270 Abnormal Development Spring. 3 credits. Prerequisites: HDFS 115, Psychology 101, or Education 110. Not offered 1986–87. M W F 11:15, E. Walker, S. Ceci. An introduction to the cognitive, emotional, and biological aspects of abnormal development across the life span. The major mental illnesses will be covered including schizophrenia and affective disorders. The course also addresses problems in adjustment, such as delinquency, and abnormalities in intellectual development (e.g., mental retardation, attention deficit disorder, and learning disabilities). Emphasis will be placed on the developmental antecedents of maladaptation, current theories of etiology, and intervention strategies.

300 Special Studies for Undergraduates Fall or spring. Credit to be arranged. Hours to be arranged. Department faculty. Special arrangements are made for courses not offered which are in this field or for courses offered at the graduate level. Limited to 10 students. M W F 1:10–2:05. S. Cornell. This course provides a general introduction to theories and research on adult development and aging. The course emphasizes biological and cognitive changes during adulthood. Topics examined include physical health, disease, and longevity; issues in long-term care and institutionalization; and changes in cognitive processes involving sensation, perception, memory, thinking, and intelligence.

313 Problematic Behavior in Adolescence Fall. 3 credits. Prerequisites: HDFS 216 or 217. Students interested in adding related field experience should register for HDFS 410. M W F 9:05. R. Savin-Williams. This course focuses on (1) various biological, psychological, and sociological theories that attempt to explain deviant behavior among adolescents, (2) research that addresses issues of problematic behavior; and (3) presentations by human services personnel and agencies concerning their programs and policies toward problematic adolescents. These will be integrated during class discussions.

experience in the past, focusing on class, ethnicity, sex, and region as important variables. Analysis of the private world of the family deals with changing cultural conceptions of sexuality, sex roles, generational relationships, stages of life, and life events. Students are required to do a major research paper on the history of their family, covering at least two generations, and demonstrating their ability to integrate life-course development theory, data drawn from the social sciences, and historical circumstances.

360 Personality Development in Childhood
Spring. 3 credits. Prerequisites: HDFS 115 or Psychology 101, plus one other course in HDFS or psychology.

372 Typical and Atypical Intellectual Development
Spring. 3 credits. Prerequisites: HDFS 115, a course in statistics, and a course in biology.

380 Aging and Health
Fall. 3 credits. Prerequisites: HDFS 218 and 219 and Biological Sciences 109–110 or equivalent.

389 Experimental Child Psychology
Fall. 4 credits. Prerequisites: one course in statistics and permission of instructor. Intended primarily for students interested in entering graduate programs involving further research training. Not offered 1986–87.

397 Experimental Child Psychology
Fall. 4 credits. Prerequisites: HDFS 218 and 219 and Biological Sciences 109–110 or equivalent.

400–401–402–403 Special Studies for Undergraduates
Fall in spring. Credits to be arranged. S-U grades optional.

404 Projects in Public Policy (also Government 500)
Fall or spring. 4–6 credits. Limited to juniors, seniors, and graduate students. Enrollment by permission of instructor and HDFS faculty sponsor. Hours to be arranged. Chairman, Cornell-in- Washington Program, and staff.

403 Teaching Apprenticeship
Fall. 3 credits. Prerequisite: HDFS 115 or equivalent. Designed to provide student teachers with the opportunity to observe a full-year classroom situation under the direction of a qualified teacher.

414 Policies and Programs for Adolescents
Spring. 3 credits. Prerequisites: HDFS 218 and 219 and biological sciences 109–110 or equivalent.

420 Directed Readings
For study that predominantly involves library research and independent study.

424 Cognitive Development and Education
Spring. 3 credits. Prerequisite: HDFS 115 or equivalent.

425 Teaching Apprenticeship
Fall. 3 credits. Prerequisite: HDFS 115 or equivalent. This course involves assisting faculty with instruction.

429 Senior Honors Seminar
Fall. 3 credits. Prerequisites: HDFS 218 and 219 and Biological Sciences 109–110 or equivalent.

431 Learning in Children
Fall. 4 credits. Prerequisite: HDFS 115 or equivalent.

436 An Ecological Approach to the Study of Television
Spring. 3 credits. Prerequisite: a developmental or psychology course; HDFS 115 or Psychology 101 preferred. S-U grades optional. Offered alternate years.

437 The Development of Social Behavior
Spring. 3 credits. Limited to 100 students. Prerequisite: HDFS 115 or Psychology 128. Offered alternate years. Not offered 1986–87.

441 Field Experience in Adolescent Development: The Individual in Community Settings
Fall. 2–4 credits. Prerequisites: HDFS 218, 219, and 313 and permission of instructor. S-U grades only. Not offered 1986–87.

443 Principles of Public Policy
Fall. 2 credits. Prerequisite: HDFS 218 and 219 and Biological Sciences 109–110 or equivalent.

446 Directed Readings
For study that predominantly involves library research and independent study.

449 Supplemental Workshop
Fall. 2 credits. Prerequisite: HDFS 218 and 219 and Biological Sciences 109–110 or equivalent.

451 Research Methods in Psychology
Fall. 3 credits. Prerequisite: one course in psychology and permission of instructor. Intended primarily for students interested in entering graduate programs involving further research training. Not offered 1986–87.

452 Teaching Apprenticeship
Spring. 3 credits. Prerequisite: HDFS 115 or equivalent. Designed to provide student teachers with the opportunity to observe a full-year classroom situation under the direction of a qualified teacher.

459 Behavioral Disorders of Childhood
Fall. 3 credits. Prerequisites: Psychology 101 or Education 140, and a course in personality development (such as HDFS 270) and an equivalent. Not offered 1986–87.

460 Field Experience in Adolescent Development: The Individual in Community Settings
Fall. 2–4 credits. Prerequisites: HDFS 218, 219, and 313 and permission of instructor. S-U grades only. Offered alternate years.

463 Directed Readings
For study that predominantly involves library research and independent study.

465 Supervised Fieldwork
For study that involves both responsible participation in an evaluation or an execution of an agency or in a political campaign organization, or with a lobby or interest group. Students spend at least twenty-five hours each week in their placement and two hours biweekly in group seminar and have a weekly conference with the instructor, who is a member of the Cornell-in-Washington staff. Because enrollment is limited, students must apply to agencies with openings and be accepted by them, students desiring to participate in this program should contact the course instructor, indicating their interest by the middle of the semester preceding the semester of desired participation. Prior to enrollment in this course, students must also identify an HDFS faculty sponsor who is knowledgeable in the subject area in which they want to do the required research report.

466 Field Experience in Adolescent Development: The Individual in Community Settings
Fall. 2–4 credits. Prerequisites: HDFS 218, 219, and 313 and permission of instructor. S-U grades only. Not offered 1986–87.

470 Directed Readings
For study that predominantly involves library research and independent study.

473 Behavioral Disorders of Childhood
Fall. 3 credits. Prerequisites: Psychology 101 or Education 140, and a course in personality development (such as HDFS 270) and an equivalent. Not offered 1986–87.

474 Field Experience in Adolescent Development: The Individual in Community Settings
Fall. 2–4 credits. Prerequisites: HDFS 218, 219, and 313 and permission of instructor. S-U grades only. Offered alternate years.

476 Directed Readings
For study that predominantly involves library research and independent study.

478 Junior Honors Seminar
Fall. 2 credits. Permission of the coordinator of the honors program required for registration. Enrollment limited to students in the honors program.

498 Advanced Practice of Gerontology
Fall. 2 credits. Prerequisites: HDFS 218 and 219 and Biological Sciences 109–110 or equivalent.

499 Senior Honors Seminar
Fall. 2 credits. Prerequisites: HDFS 218 and 219 and Biological Sciences 109–110 or equivalent.

503 Teaching Apprenticeship
Fall. 3 credits. Prerequisite: HDFS 115 or equivalent. Designed to provide student teachers with the opportunity to observe a full-year classroom situation under the direction of a qualified teacher.

508 Directed Readings
For study that predominantly involves library research and independent study.

512 Cognitive Development and Education
Spring. 3 credits. Prerequisite: HDFS 115 or equivalent.

513 Teaching Apprenticeship
Fall. 3 credits. Prerequisite: HDFS 115 or equivalent. Designed to provide student teachers with the opportunity to observe a full-year classroom situation under the direction of a qualified teacher.

515 Research Methods in Psychology
Fall. 3 credits. Prerequisite: one course in psychology and permission of instructor. Intended primarily for students interested in entering graduate programs involving further research training. Not offered 1986–87.

518 Directed Readings
For study that predominantly involves library research and independent study.

520 Supervised Fieldwork
For study that involves both responsible participation in an evaluation or an execution of an agency or in a political campaign organization, or with a lobby or interest group. Students spend at least twenty-five hours each week in their placement and two hours biweekly in group seminar and have a weekly conference with the instructor, who is a member of the Cornell-in-Washington staff. Because enrollment is limited, students must apply to agencies with openings and be accepted by them, students desiring to participate in this program should contact the course instructor, indicating their interest by the middle of the semester preceding the semester of desired participation. Prior to enrollment in this course, students must also identify an HDFS faculty sponsor who is knowledgeable in the subject area in which they want to do the required research report.
434 Piaget's Theory of Cognitive Development
Spring. 4 credits. Open to undergraduate and graduate students. Prerequisite: HDFS 115 or equivalent. S-U grades optional. Offered alternate years. Not offered 1986–87.
LeCia, M. W. F 1:25. B. Lust.
This introduction to Piaget's theory of intellectual development is intended to provide students with a basic and critical knowledge of Piaget's theory of the development of intelligence. The course reviews Genevan research on development of object permanence, the development of logic, number, and scientific thinking. Research on representation, through mental imagery and language, for example, is also discussed, as are current attempts to extend Piagetian theory to educational practice. Related critical research in these areas is also considered throughout in a supplementary, contrastive manner. Laboratory (HDFS 435) may be possible.

436 Language Development (also Psychology 436 and Linguistics 436)
Spring. 4 credits. Prerequisite: at least one course in developmental psychology, cognitive psychology, cognitive development, or linguistics. S-U grades optional. Offered alternate years.
TR 10:30–12:00. B. Lust.
A survey of basic literature in language development. Major theoretical positions in the field are considered in the light of studies in first-language acquisition of phonology, semantics, and syntax in a sequence. The acquisition of communication systems in nonhuman species such as chimpanzees are addressed, but major emphasis is on the child. The fundamental issue of relationships between language and thought is also discussed.

437 Creative Expression and Growth
Fall. 4 credits. Limited to 25 students. May be added during first week only. Cannot be taken concurrently with HDFS 338.
TR 10:10–11:30. Saturday mornings should be free to provide time for participation with children.
W. L. Bratian.
Aimed at an appreciation and understanding of the creative process in art, music, dance, and drama in relation to the development of children.

438 Thinking and Reasoning
Fall. 3 credits. HDFS 115.
The course will examine the areas of logical thinking (in formal as well as real-world contexts), the process of making logical and "natural" inferences, causal reasoning, and scientific reasoning. Two general issues will run through the course: the extent to which children and adults develop theories of reasoning that are embedded in the models of the area of specialization in cognitive development, and the extent to which various models accurately describe the kind of thinking that is required by the types of problems and issues that arise and must be dealt with in the real world.

440 Internship in Cornell Nursery School
Fall or spring. 10–12 credits. Prerequisites: HDFS 115 and 242. Recommended: HDFS 346 and 348.
M–F 8–1 or 10:30–4:30. Staff.
Internship in Cornell Nursery School. Opportunity to integrate theory with practice and to develop understanding of preschool children and their families. Placement as assistant teacher in the morning or afternoon program and participation in curriculum planning, events, and meetings; home visits, parent conferences, and parent meetings. Supervision by head teacher and director.

456 Families and Social Policy
Fall–3–4 credits. On campus and in Washington. Prerequisite: one course in the area of family or in sociology. S-U grades optional.
TR 10:10–12:00. P. Moen.
An examination of the intended and unintended consequences of governmental policies, using case studies in areas such as social welfare, day care, and employment. The policy implications of changes in the structure and composition of families are also considered.

481 Introduction to Ecological Psychology
Spring. 3 credits. Limited to graduate and upper-division undergraduate students. Prerequisite: permission of instructor. Letter grades only.
This is a broad survey of the theory, concepts, methods, and empirical research in ecological psychology, the study of molar human behavior in relation to the naturally occurring molar environment of everyday life. The first part of the course examines the problem of observing, recording, and analyzing the continuous stream of individual behavior under natural conditions, with special concern for child behavior and development. The rest of the course is devoted to the study of behavior settings, the immediate environmental contexts of molar human behavior. We will be particularly concerned with the usefulness of behavior settings in empirical studies of person-environment interactions at all stages of the life course from infancy through old age. A course description with typical readings is available from the instructor.

485 (01) Human Development in Post-Industrialized Societies
Spring. 4 credits. Enrollment limited to 20 juniors and seniors from various schools and colleges. This is one of a series of Common Core Learning Courses specially designed to contribute to general education at the upperclass level. Each course focuses on a topic of significance to contemporary society and has been developed by a faculty team from different disciplines, with one instructor taking primary responsibility for the integration and teaching of the course.
The course analyzes the implications for human development of the profound economic, technological, and social changes that have been taking place in modern societies. Particular emphasis is placed on the effect of these changes on the family, health, child care, and social services; the school; the workplace; the community; and the relations between these domains as they influence processes of biological and psychological development throughout the life course. The topic will be treated from the perspective of several relevant disciplines, including economics (Robert H. Frank), developmental psychology (Steve Ceci), social anthropology (Robert J. Smith), human biology (Virginia Utermohlen), sociology (Phyllis Moen), and the law (Peter W. Martin).

488 Development in Context (also Psychology 488)
Fall. 4 credits. Open to juniors, seniors, and graduate students. Prerequisites: one course in statistics and two courses in social sciences, or one in human biology and one in social sciences.
The course presents a systematic examination of existing research on human development throughout the life course in the actual environments in which people live. Attention is focused on the interplay between biological and environmental influences. These influences derive both from the immediate settings containing the developing person and the larger cultural and historical context in which they are embedded. Implications are drawn for public policy and practice.

498 Senior Honors Seminar
Fall. 1 credit. Required for, and limited to, seniors in the HDFS honors program.
W 2:30. P. Schoggen.
This seminar is devoted to discussion and presentation of honors theses being completed by the senior students.

499 Senior Honors Thesis
Fall or spring. Credit to be arranged. Prerequisite: permission of thesis adviser and director of honors program. S-U grades optional. Department faculty.

Topics Courses
Fall or spring. 2–4 credits. Prerequisites and enrollment limits vary with topic being considered in any particular term. Permission of instructor required. Hours to be arranged. Department faculty. This series of courses provides an opportunity for advanced undergraduates to explore an issue, a theme, or research in the areas of departmental concentration. Topics vary each time the course is offered. Descriptions are available at the time of course registration. Although the courses are usually taught as seminars, a subject may occasionally lend itself to lecture, practicum, or other format.

415 Topics in Adolescent Development
435 Topics in Cognitive Development
445 Topics in Early-Childhood Education and Development
455 Topics in Family Studies
465 Topics in Social and Personality Development
475 Topics in Atypical Development
485 Topics in the Ecology of Human Development

The Graduate Program
Human development and family studies graduate courses are open to undergraduates only with instructor's permission.

General Courses
[617 Adolescence Fall. 3 credits. Not offered 1986–87. Hours to be arranged. Staff.
Critical examination of some seminal theoretical writings on adolescence development, along with recent work relevant to intellectual development, ego development, and social development during early and late adolescence. Empirical research on specific questions chosen by students is considered in the light of these approaches.]

631 Cognitive Development
Spring. 3 credits. Letter grade only.
R 10:30–12:30. M. W. L. Britain, S. Ceci, S. Cornellis, B. Kosowski, B. Lust, M. Potts, G. Suci.
Faculty members involved in the course will present their area of specialization in cognitive development. These areas will include perception, attention, memory, language, thinking and reasoning, learning, and creativity.

640 Infancy
Spring. 3 credits.
Critical review of major issues of contemporary concern in the field of infant behavior and development, based on readings of selected research papers and review articles. The overall intent is to develop an analytic understanding of where the field stands at present with respect to various topical issues and to identify directions for future research.

641 Early-Childhood Education
Fall. 3 credits. M 12:20–2:50. M. Potts.
Survey of major issues in the theoretical and research literature of early-childhood education.

650 Contemporary Family Theory and Research
Spring. 3 credits.
The use of sociological theories and research in the study of the family are studied with particular reference to the relationship between the family and society and between the family and its individual members.
Human Service Studies Courses


Human Ecology

651 Family Theory and Research 1865–1965: Sociological and Historical Perspectives  Spring. 3 credits. Offered alternate years. Hours to be arranged. E. Kain. This course provides a foundation in family theory and research from the inception of the scientific study of families in the nineteenth century through 1965. Students will read classic papers and major monographs in the field, drawing from the disciplines of anthropology, demography, history, psychology, social psychology, and sociology. The major emphasis is on work in sociology.

[660 Personality and Socialization  Spring. 3 credits. Hours to be arranged. J. Condry. Major issues in personality development and socialization, with special emphasis on theoretical models and empirical issues.]

670 Abnormal Development  Fall. 3 credits. Prerequisite: undergraduate course in abnormal psychology or psychopathology. Not offered 1986–87. W 1:25–4:25. E. Walker. Overview of current theories and empirical research on functional and organically based psychological disorders. Topic areas to be covered include autism, schizophrenia, neuroses, and personality disorders. Focus is on development aspects of abnormal behavior.

Topical Seminars Seminars offered irregularly, with changing topics and instructors. Content, hours, credit, and instructors to be announced. Seminars offer concentrated study of specific theoretical and research issues.

618 Seminar in Adolescence Topics include peer relations, parent-teen relationships, self-esteem, youth and history, work, and moral development.

633 Seminar on Language Development Topics include acquisition of meaning in infancy, precursors of language in early infancy, and atypical language development.

635 Seminar in Cognitive Development Topics include early attention, perception, memory, and communication. Assessment and intervention in relation to these processes will be considered when possible.

645 Seminar on Infancy Topics covered in depth include the role of emotions in early development, infant stimulation and early experience, and the assessment of infant developmental competencies.

646 Seminar in Early-Childhood Education Topics include analysis of models and settings, design of assessment techniques, program evaluation, and early childhood in a cross-cultural context.

655 Seminar in Family Studies Topics include the sociology of marital status, the single-parent family, work-family linkages, women and work, and families and social change.

665 Seminar in Personality and Social Development Focuses on selected issues related to personality and social development. The issues selected vary each year according to current importance in the field and student interests.

675 Seminar in Developmental Psychopathology Topics include learning disabilities, therapeutic interventions in atypical development, child abuse and maltreatment, family factors in the etiology of functional disorders, and cognitive characteristics of atypical groups.

685 Seminar in Human Development and Family Studies Topics include development of self-concept, sex-role identity, observational methods, and interviews in developmental research.

690 Seminar on Ecology of Human Development Topics include the institutional setting as a determinant of behavior, the poor family, and the identification and measurement of ecological variables.

Individualized Special Instruction

700–705 Special Studies for Graduate Students Fall or spring. Credits and hours to be arranged. S-U grades at discretion of instructor. Department faculty. Independent advanced work by graduate students recommended by the Special Committee chairperson with approval of the instructor.

700 Directed Readings For study that predominantly involves library research and independent study.

701 Empirical Research For study that predominantly involves collection and analysis of research data.

702 Practicum For study that predominantly involves field experience in community settings.

703 Teaching Assistantship For students assisting faculty with instruction. Does not apply to work for which students receive financial compensation.

704 Research Assistantship For students assisting faculty with research. Does not apply to work for which students receive financial compensation.

705 Extension Assistantship For students assisting faculty with extension activities. Does not apply to work for which students receive financial compensation.

706 Supervised Teaching For advanced students who assume major responsibility for teaching a course. Supervision by a faculty member is required.

899 Master's Thesis and Research Fall or spring. Credit to be arranged. S-U grades only. Prerequisite: permission of thesis adviser. Department graduate faculty.

999 Doctoral Thesis and Research Fall or spring. Credit to be arranged. S-U grades only. Prerequisite: permission of thesis adviser. Department graduate faculty.


202 Introduction to Program Planning and Planning Development  Spring. 3 credits. M.W.F 9:05. M. Minot. The course provides an introduction to program planning and development in the delivery of human services. Models of program planning, development, and delivery will be analyzed in relation to practice. The processes of conceptualizing a program and the context of planning and development (political, organizational, economic, and social) will be examined. Basic tools and techniques available to the planner will be identified and selected skills developed. Issues related to ethics, power/authority, confidentiality, and accountability will be included. Professional roles and competencies needed will be highlighted throughout the course. Students will apply the planning and development process to individual projects.

203 Groups and Organizations  Spring. 3 credits. M.W.F 10:10. B. Babcock. A basic course in the social psychology of small groups and human service organizations. Study of group processes includes self-perception and interpersonal perception of roles, communication, power, and leadership. Students apply what has been learned about small groups to the study of issues in human service organizations (for example, goal evaluation, structure, relationships between organizations and clients, environment, and change).

225 Education as a Human Service  Fall. 3 credits. M.W.F 11:15. M. Minot and staff. This course is concerned with the role of the educator as a professional provider of preventive and remedial intervention through knowledge that results in intentional changes in cognitive, affective, or psychomotor skills of individuals. The education, in collaboration with other human service professionals, facilitates human growth and development. The course includes an overview of educational programs that use human ecology content in selected human services delivery systems and settings. Emphasis is placed upon the competencies and responsibilities of the professional assuming the educative role.

246 Ecological Determinants of Behavior  Fall. 3 credits. Prerequisites: introductory sociology and psychology; a human development course. M.W.F 2:30. C. Shapiro. Compares conceptual models of human behavior, encouraging the student to incorporate an ecological model into his or her personal-professional framework. Introduces an ecological perspective on social problems and professional practice in human services and social work in particular. The ecological-systems approach embodies holistic philosophy and concern with interaction and "goodness of fit" between people and environment. Emphasis on biopsychosocial functioning of the person-in-situation and valuing human diversity.

280 Racism in American Society  Fall. 3 credits. W 7:30–10 p.m. J. Turner, D. Barr. The purpose of this course is to explore the historical, political, and sociological dimensions of racism in American society. A major goal will be to understand the presence and persistence of racial inequality and the relationship of human services to the problems of racism.

292 Research Design and Analysis  Fall. 3 credits. W 7:30–10 p.m. W. Troitch. Students should develop skill in analyzing and evaluating research reports. Readings and periodic assignments and exercises focus on stating hypotheses, designing studies to test hypotheses, measuring variables, and interpreting findings.
The relationship between a classed, racist, and sexist society and the human services will also be included by exploring the nature of empowerment. The course will focus systematically on both the micro- and macrolevels.

421 Social Planning for the Elderly
Fall, 3 credits. Prerequisite: HSS 331 or approved courses in human development, sociology, or psychology. S-U grades optional.
T R 2:30–4: H. Brown. Students will be based on the Older Americans Act and Amendments will be examined along with an overview of social gerontology. Opportunity will be provided to study a specific program for the elderly or programs for specific subpopulations of the elderly.

441 Preparation for Internship in Human Ecology Education
Fall, weeks 1–7. 2 credits. Limited to students completing human ecology education requirements. Prerequisites: HSS 331 and 202 (if taken prior to fall 1986, HSS 439 may be substituted for HSS 202). To be taken concurrently with HSS 442 and 443. May involve some expense for field visits.
T R 10:10–12:05, plus hours to be arranged during independent study week. M. Minot.
An orientation for the internship in education. Major topics interrelated are development and management of learning environments, evolution of the teaching-learning processes in relation to personal goals and unit objectives, philosophy, creativity and teaching techniques, professionalism, and networking. Selected materials for the internship will be developed.

442 Internship in Human Ecology Education
Fall school placement, weeks 8–14. Spring non-school placements will be scheduled on an individual basis. 4–6 credits. Prerequisites: HSS 339 and 202. To be taken concurrently with HSS 441 and 443. Transportation and off-campus living costs need to be planned for in advance. Arrangements are determined by the student; expenses may or may not be more than on campus, depending on choices made.
Staff.
A guided internship experience with students assigned to cooperating community agencies. Students and faculty work closely together in selecting internship placements appropriate to the various career clusters and individual student interests. Those students completing teacher certification requirements will have a 6-credit internship in a school setting. Internships are located in different types of communities, represent a variety of organizational structures, and have comprehensive programs. Students should indicate their intent as early as possible to facilitate communication and scheduling.

443 Critical Issues in Education
Fall, weeks 1–7. 3 credits. S-U grades optional except for HSS Option I students. No students are admitted to the class after the first session.
T R 12:20–2:15, plus one hour to be arranged.
D. Tobias.
An examination of current issues in education. Analysis of historical, philosophical, social, and political factors that affect these issues.

460 Human Service Planning Methods
Spring. 3 credits. Prerequisite: HSS 292.
The course is designed to bridge theory-oriented social planning courses and practicums. It is intended to introduce undergraduates to basic tools and techniques that social planners use. Five modules are included that explain and provide experience in how social planners collect, analyze, and organize information and data in planning and policy development in the human services and that take into account the political and social contexts of the process.

465 Community Decision Making (previously CEH 472)
Fall. 3 credits. S-U grades optional. Offered alternate years.
T R 8:30–9:55. A. Hahn.
Human Ecology

Identification and discussion of factors that influence the outcome of community issues. Topics include political participation, decision-making processes, the interests and resources of key decision makers, and community change. Concurrent participation in community activities is desirable but not required.

471-472 Social Work Practice I and II
Introduction to concepts and methods used in a generalist, task-centered model of social work practice. Examination of the values and ethics of professional practice, the generalist, task-centered model of social work practice, the interests and resources of key decision makers, and agencies in Tompkins, Tioga, Chemung, Cortland, and Schuyler counties. Students are encouraged to provide their own perspectives, but car pool will be arranged for those who cannot. The department reimburses transportation costs when funds are available, but students may have to pay their own expenses. A lab fee for field-related expenses will be charged to every student in the course. Each student must have a current driver's license.

471 Social Work Practice I
Fall. 9 credits. Limited to 25 social work students. Prerequisites: introductory psychology, introductory sociology, one course in human development, grades of C- or better in HSS 246 and 370, and permission of instructor before registration.
Lec, M W 10-12:05; fieldwork, T R for 8 hours each day C. Shapiro.

472 Social Work Practice II
Spring. 9 credits. Limited to 25 social work students. Prerequisites: grade of B- or better in HSS 471 and satisfactory performance in fieldwork.
Lec, M W 10-12:05; fieldwork, T R for 8 hours each day C. Shapiro.

473 Senior Seminar in Social Work
Spring. 3 credits. Limited to 25 social work students. Prerequisites: HSS 370 or Government 111 or Sociology 141 S-U grades optional. Students should have field or work experience in a human-service program before or while taking this course. Not offered 1986-87; next offered Fall 1987-88.

M W 9:05: Staff. An examination of the policy-making process and the significance of national policies as they affect the distribution of social services. Frameworks for analyzing social policy are used to evaluate existing social programs and service delivery systems. Implications for change in policies at the national, state, and local levels are discussed.

490 (previously 662) Introduction to Public Health
Fall. 4 credits. S-U grades optional. Offered alternate years. Not offered 1986-87; next offered 1987-88.
M W F 10: 10. J. Ford. Attraction is based on assumptions and concepts that underlie social responsibility for health. Reviews of human behavior in the social environment are presented in relation to health and disease and the rationale for various public health policies and programs. Case studies are used to apply principles and concepts from readings and lectures.

The Graduate Program
Human service studies graduate courses are open to undergraduates only with the instructor's permission.

The courses listed below will be taught regularly (annually or in alternate years).

600 Special Problems for Graduate Students
Fall or spring. Credits to be arranged. For students recommended by their chairperson and approved by the instructor in charge for independent advanced study. S-U grades optional. Department faculty.

622 Health-Services Management
Fall. 3 credits. T 11:30-1:55. D. Brown. Designed as a department seminar for students interested in hospital and health services administration and consulting, the course focuses on the management process and attempts to develop the students' problem-solving skills through the analysis of cases. A number of major themes are explored, such as the formulation of objectives, governance and corporate structure, medical staff relationships, organization change and leadership, motivation, group processes, and conflict management.

627 Legal Aspects of Health-Services Delivery
Spring. 3 credits. M W 10-11:30 J. Ogden. This course introduces principles of the law that are specifically applicable to health-services delivery. Topics considered include the liability of health professionals and their staff and personnel for injuries to patients; medical records and disclosure of information; consent to medical and surgical procedures; responsibility for the patient's personal property; collection of bills; medical staff privileges; and confidential communications.

628 Medical-Service Issues in Health Administration
Fall. 3 credits. M W F 2:30-3:30. V. Utermohlen. A survey of the issues that affect interactions between the health-care consumer and the medical team, including demographic factors affecting health-care service delivery, trends in the health-care industry, planning for the growth of the health-care industry, and the exercise of choice in the initiation of first-contact medical care. The organization of primary health-care services is described in part three. Some of the topics include hospital outpatient services, private group practice, and health maintenance organizations. The remainder of the course provides a critique of community power structure theory and popular models for managing social change.

632 Labor Relations in the Health Industry
Spring. 1 credit. W 4-6:30 (course meets for 5 sessions only). W. Abelow. This course provides an overview of the major topics and current issues of unionization in the health industry. It emphasizes a practical, direct approach to dealing with union organizing and elections, collective bargaining, strikes, and labor contract administration in the health industry. The history of unionization in the field and an analysis of applicable laws are covered. Particular emphasis is placed on the role of government and other regulatory agencies in the negotiation process. Students work with current actual cases and materials. Films are also used. Students have the option of taking a final examination or submitting a short research paper.

633 HMO Development and Management
Spring. 1 credit. W 4-6:30 (course meets for 5 sessions only). F. Yanni. The major goal of this course is to provide students with the conceptual framework for understanding the role of health maintenance organizations (HMOs) in today's health economy and to provide an introduction to the planning, development, and operation of HMOs.

635 Field Studies in Health Administration and Planning
Fall or spring. 1-4 credits. Hours to be arranged. D. Brown. Students interested in developing administrative and program-planning skills which are given special opportunity to evaluate an ongoing phase of health care agency activity in the light of sound administrative practice and principles of good medical care. In planning and carrying out the research, students work closely with a skilled practicing administrator and with members of the school's faculty.

636 Financial Management of Health and Human Service Organizations
Fall. 3 credits. Prerequisites: financial accounting course or permission of instructor. M W T 7-8:30 p.m. W. Corbin. The purpose of this course is to provide the student with a basic understanding of the financial aspects of managing health and other human service organizations. In 1986-87 the course will focus mainly on health-care organizations, but it is expected that much of the content will be applicable to other human service agencies. It begins with an overview of financial information in health care, rate setting, and capital management. The middle section of the course deals with pricing and inventory management, and the last part discusses problems and trends in hospital financing.

[650 Teaching Human Services in Higher Education
Fall. 3 credits. S-U grades optional. Offered alternate years. Not offered 1986-87; next offered 1987-88.
M W 11:15, plus 1 hour to be arranged. Staff. Basic strategies for planning and implementing instruction in human services in higher education—for example, in-service, training programs, and two- and four-year colleges. Types of issues examined by researchers include variables involved in modes of
learning, structure of content, and instructional settings. Emphasizes conceptualizing the teaching-learning process. Students are expected to develop instructional plans related to interests in the human services and to develop a repertoire of teaching skills through professional sequences in microteaching, classroom teaching, or both.)

651 Adult Development and the Provision of Human Services  Spring. 3 credits. S-U grades optional. Offered alternate years. W 7:30–10:30 p.m. H. Brown. Provides a survey of theories of adult development. Forces affecting the development of the self, age changes, role perceptions, life tasks, or roles related to the adult's life cycle are examined. Biological factors, interpersonal relationships, social and cultural influences, and historical events are considered. Offered with special emphasis on perspectives on adult development. Opportunity for an empirical investigation of an adult population is provided. Implications from theories and student-collected data are examined in relationship to the provision of human services programs.

652 Preparing Professionals in the Human Services  Spring. 3 credits. S-U grades optional. Offered alternate years. T R 10:10–11:25. M. Minot. The student analyzes the assumptions and concepts that underlie preprofessional and professional levels of practice in education, health, human services, community education. Students must register for both semesters. Offered alternate years.

653 Consulting and Supervisory Roles in Human Services  Fall. 3 credits. S-U grades optional. Offered alternate years. Not offered 1986–87; next offered 1987–88. Hours to be arranged. Staff. Analysis of theories and practices of consulting and supervisory roles in human service agencies. Issues of decision making, fiscal arrangements, and public and private sector interactions are explored as they are affected by intergovernmental relationships. The course provides students with an analytic framework for understanding the relationships within and between various governmental levels.

6590 Measurement for Program Evaluation and Research Fall. 3 credits. T R 10:10–11:25. J. Greene. This course reviews measurement theory and its application to the evaluation of human service programs. Topics include validity; reliability; scaling methods; basic principles of instrument design; and methods of data collection, including interviewing strategies, testing, self-report, observation and content analysis, and data coding. Attention is given to issues such as ethical and managerial concerns that arise in applied settings.

691 Program Evaluation and Research Design Spring. 3 credits. Prerequisite: introductory statistics course strongly recommended. T R 2:30–3:45. W. Trosch. Techniques and strategies for research design and its application to the evaluation of human service programs. Major topics include experimental, quasi-experimental, cross-sectional, and exploratory research design theories; and the use of qualitative and quantitative methods. Attention is given to issues that arise in the application of research designs to the evaluation of programs, including problems of randomization, causal inference, replication, and utilization of results. Skills covered include stating and testing hypothesis, critical analysis of research reports, computer simulation, and development of a research proposal.

692-693 Program Evaluation in Theory and Practice 692, Fall; 693, Spring. 4 credits each semester. Prerequisites for HSS 692: 690 and 691, or permission of instructor. Prerequisite for HSS 693: 692. Students must register for both semesters. Offered alternate years. Not offered 1986–87; next offered 1987–88. Hours to be arranged. Staff. A two-semester practicum in which the class designs and conducts a program evaluation in the human services. Students are involved in all phases of the evaluation from design through the production and dissemination of a final report. Emphasis is on research methods in the social sciences. Application of knowledge developed in prerequisite courses is stressed. For example, planning and managing the evaluation, ethics, methods of data collection, data processing, and strategies for analysis and feedback of results.

695 Strategies for Policy and Program Evaluation Fall. 3 credits. Prerequisites: HSS 690 and 691 or equivalent. Offered alternate years. T R 2:30–3:45. J. Greene. This course examines a wide range of approaches to the evaluation of policies and programs in the human services. Traditional social science methods are reviewed as well as investigative and evaluative methods from other disciplines (e.g., auditing, law, history, sociology, philosophy). Analysis of common and divergent tactics among different approaches to evaluation will be used to judge the appropriateness of a given strategy for a particular type of setting.

696 Qualitative Methods for Program Evaluation Spring. 3 credits. Prerequisites: HSS 690 and 691 or equivalent. Offered alternate years. T R 1:25–2:40. J. Greene. This course explores the issues related to qualitative research methodology and the evaluation of human service programs. Topics include the underlying epistemological assumptions, questions of entry into setting, data collection, data analysis, confidentiality of participants, and the ethics of qualitative research approaches. It is the aim of the course to identify those settings and researchable questions where such a methodology is most appropriate.

704–705 Internship in Human Service Studies Fall, spring, or summer. 1–5 credits. S-U grades optional. Hours to be arranged. Graduate faculty.

790 Advanced Seminar in Program Evaluation Spring. 3 credits. S-U grades optional. Prerequisite: permission of instructor. Hours to be arranged. C. McClintock. Intended for students with competence in program planning and program evaluation (equivalent to at least one course of the HSS 660 series and three of the HSS 690 series) plus statistics through multiple regression. The seminar focuses on current literature on program evaluation and evaluative research, with emphasis on the links between program evaluation and program planning and administration. Attention is given to two or more service areas (education, health, social welfare) and to applications across these areas.

899 Master's Thesis and Research  Fall and spring. Credit to be arranged. Prerequisite: permission of the chairperson of the graduate committee and the instructor. S-U grades optional. Hours to be arranged. Department graduate faculty.

999 Doctoral Thesis and Research  Fall and spring. Credit to be arranged. Prerequisite: permission of the chairperson of the graduate committee and the instructor. S-U grades optional. Hours to be arranged. Department graduate faculty.

Topical Seminars and Practicums

Seminars and practicums, offered irregularly, based on faculty and student interest, with changing topics and instructors. Content, time, credits, and instructors to be announced. Seminars and practicums offer concentrated study in a specific human service area or in the education, planning, or evaluation processes within human services.

610 Seminar in Adult and Community Education Topics include citizen participation, educational outreach for adults, postsecondary education, and cross-cultural programs.
611 Seminar in Home Economics Education
Topics include history, philosophy, legislation and policy, research, ecological approaches to programming, and secondary education programs.

612 Seminar in Social Welfare Services
Topics include services to children, aging, families, income-maintenance programs and reforms, and corrections.

613 Seminar in Health and Mental Health Services
Topics include alcohol and drug problems, developments in health and mental health policy and planning, and community mental health services.

658 Practicum in Higher Education in Human Services
Activities include college teaching, in-service education, and other efforts related to the preparation of professionals in the human services.

659 Seminar in Higher Education in Human Services
Topics include professional versus agency belief systems, teacher education, developments in higher education in the human services. Two or more human services are examined.

668 Practicum in Program Planning and Development
Spring. Hours to be arranged. Staff. Activities include preparing plans, organizational change, and developing resources and community support.

669 Seminar in Program Planning and Development
Fall. Topics include microlevel program planning, third-sector organizations, and intergovernmental influences on program planning, policy formation, program implementation, and mainstreaming. Two or more human services are examined.

698 Practicum in Program Evaluation and Evaluative Research
Activities include performing policy and agency evaluations, needs assessments, and research studies related to evaluation of programs.

699 Seminar in Program Evaluation and Evaluative Research
Topics include legislative planning; planning for evaluation, utilization, methodological and conceptual developments; social science; and public policy. Two or more human services are examined.

Continuing Education for Professionals
These courses are not a part of the department’s regular graduate offerings but are designed to provide continuing education for professionals through the extramural division.

503 Groups and Organizations
Spring. 3 credits. Registration through the Division of Extramural Courses only. Hours to be arranged. Staff. A course in the social psychology of small groups and human service organizations. Study of group processes includes self-perception and interpersonal perception roles, norms, communication, power, and leadership. Students apply what they have learned about small groups to the study of issues in human service organizations.

507–508 Professional Improvement I and II
Fall, spring, or summer, 3–6 credits. Enrollment is determined by various factors, including nature of content, funding, resources, facilities, and instructor. S-U grades optional. Intended for extramural (evening) and off-campus instruction. May be repeated with the permission of the instructor.

A series of special-problem seminars, clinics, and activities designed for in-service and continuing education of practitioners in helping professions, such as home economics teachers, social workers, public health planners, and adult educators. Specific content of each course varies with group being served but includes work and class time appropriate to number of credits.

529 Research Design and Analysis
Summer. 3 credits. Registration through the Division of Extramural Courses only. Hours to be arranged. Staff. Students should develop skill in analyzing and evaluating research reports. Readings, exercises, and periodic assignments focus on stating hypotheses, designing studies to test hypotheses, measuring variables, and interpreting findings.

537 Social Welfare as a Social Institution
Fall. 3 credits. Registration through the Division of Extramural Courses only. Hours to be arranged. Staff. A philosophical and historical introduction to social welfare services. The course reviews the social contexts from which programs and the profession of social work have evolved. It discusses the political and ideological processes through which public policy is formed and how policies are translated into social programs. Basic issues in welfare are discussed in the context of present program design, public concerns, and the interrelationships and support of services in the community.

546 Ecological Determinants of Behavior
Summer. 3 credits. Registration through the Division of Extramural Courses only. Hours to be arranged. Staff. An introductory course concerning the identification of some major determinants of human behavior and their interaction. Students examine (through readings, papers, and discussion) different ecological perspectives of behavior and attempt to integrate these perspectives into a human services framework. For example, the implications of an ecological perspective for the planning and delivery of services are emphasized.

574 Program Development in Social Services
Spring. 3 credits. Registration through the Division of Extramural Courses only. Hours to be arranged. Staff. Deals with program development in the fields in which students are or will be working.

575 Organization and Structure for Delivery of Social Services
Spring. 3 credits. Registration through the Division of Extramural Courses only. Hours to be arranged. Staff. A framework for assessing and understanding the range of issues posed in the current organization and delivery of various social services. Concepts of social policy analysis are used to evaluate different social service systems, new models of service delivery being developed, and proposals for change being made at national, state, and local levels. Students should have some form of field or work experience in human services prior to, or concurrent with, this course.

Related Courses in the Johnson Graduate School of Management
NBA 584 Health Services Organization and Financing
Fall. 3 credits. R. Battistella.

NBA 685 Social Policy and Economic Growth
Fall. 3 credits. R. Battistella.

NBA 688 Health and Social Services Delivery Systems: Long-Term Care and the Aged
Spring. 3 credits. R. Battistella.
sophomore year. Minimum cost of materials: $80; lab fee, $10.
This studio course examines two interrelated methods of apparel design. Through exercises, principles and processes of draping, fitting, and advanced flat pattern making are studied. Assigned problems require the students to make judgments regarding the design process, the nature of materials, body structure, function, and fashion.

300 Special Studies for Undergraduates Fall or spring. Credit to be arranged.
Hours to be arranged. Department faculty. Special arrangement for course work to establish equivalency for courses not transferred from a previous major or institution. Students prepare a multiplicity description of the study they want to undertake, on a form available from the Counseling Office. The form, signed by both the instructor directing the study and the head of the department, is filed at course registration or during the change-of-registration period.

331 The Textile and Apparel Industries Fall. 3 credits. Prerequisites: Economics 101 and 102 or CHE 110 and 111 and an upper-division course in either apparel textiles or draping. A study of textile and apparel management, marketing, and administration. MINITAB will be used. Prerequisites: TXA 335.
This course covers (1) how fabrics are made, (2) how the method of manufacture influences fabric properties, and (3) how the method of manufacture limits potential applications of fabrics. The technical aspects of textile fabrics are covered in detail. Available production technologies are reviewed. Properties of woven, knitted, and nonconventional fabrics, methods of producing structural designs, and means of designing fabrics to specifications are covered.

335 Formation and Structure of Textile Fabrics Fall. 3 credits. Prerequisite: TXA 135. Recommended: Education 115.
Lecs, M W F 1:25; P. Schwartz.
This course covers the practical applications of textiles. A study of the interrelationship of human physiology, cloth properties, consumer, including easy care, elasticity, durability, comfort, and aesthetics. Laboratory experimentation illustrates the important interrelationships among structures and properties of polymers, fibers, yarns, and fabrics.

400 Directed Readings For study that predominantly involves library research and independent reading.

401 Empirical Research For study that predominantly involves data collection and analysis, or laboratory or studio projects.

402 Supervised Fieldwork For study that involves both responsible participation in a community setting and reflection on that experience through discussion, reading, and writing. Academic credit is awarded for this integration of theory and practice.

403 Teaching Apprenticeships Fall or spring. 2-4 credits. Prerequisites: student must have upperclass standing, have a structure and a high level of performance in the subject to be taught and in the overall academic program, and have permission of the instructor and the department chairman. S-U grades only.
Apprenticeship includes both a study of teaching methods in the field and assisting the faculty with instruction.

431 The Textile and Apparel Industries—Field Experiences Spring. Special term break. 1 credit. Prerequisite: TXA 335 and statistics. Offered alternate years. Students are responsible for trip expenses, approximately $300. A one-week field experience in the textile regions of the South. Students have the opportunity to see various textile processes, including fiber production, knitting, weaving, dying, and finishing, and designing. In addition, seminars with executives of each participating firm relate theory to current practice.

432 Textile Testing and Evaluation Spring. 3 credits. Prerequisites: TXA 337 and statistics. Offered alternate years. Minimum cost per project: $125. A course to cover the theory and philosophy of textile testing methods related to fabrics and will include statistical procedures for the actual testing of test data. Students will use textile testing equipment in a laboratory setting. MINITAB will be used for the analysis of test data.

433 Textile Structure and Properties Spring. 4 credits. Prerequisites: TXA 436 and Physics 101, 112, or 207. Offered alternate years. Lab fee, $10.
Lecs, M W F 9:05; lab, C. C. Chu.
An in-depth study of the structure of textile materials and their component parts, from polymer molecules through fibers and yarns to fabrics; and the techniques of controlling structure to achieve desirable end-use properties. Emphasis is on properties important to the consumer, including easy care, elasticity, durability, comfort, and aesthetics. Laboratory experimentation illustrates the important interrelationships among structures and properties of polymers, fibers, yarns, and fabrics.

434 Care of Textiles Fall. 2 credits. Prerequisite: TXA 337 Not open to students who have taken DEA 445. Offered alternate years. Minimum cost of materials: $80; lab fee, $10.
Lecs, M W F 9:05; lab, W 8 M. Purchase.
The interaction of textiles with soils and stains, cleaning agents, and laundry equipment. Topics include characteristics of soils, mechanisms for bonding soils to substrates, textile properties and changes related to care processes, functional finishes, wet- and dry-cleaning processes, the supplies and techniques used in cleaning, and instructions for care.

436 Textile Chemistry Fall. 4 credits. Prerequisites: TXA 335, and Chemistry 253 and 251 or Chemistry 357-358 and 251. Offered alternate years. Lab fee, $10.
A study of the chemical interaction of organic polymers with the major classes of textile fibers. Laboratories include considerations of the reactions and properties of textile fibers and the application of instrumentation to the characterization of textile substrates.

438 Apparel Textiles Spring. 3 credits. Prerequisites: TXA 337 and 264, or permission of instructor. S-U grades optional.
T R 8:30-9:55. Field trips will be arranged when feasible. S. Watkins.
A study of the interrelationship of human physiology, apparel design, and textiles. Consideration of communication between the consumer, government, and the apparel-textile industries. Individual projects. Seminars and lectures will require readings.

439 Textile Materials for Biomedical Use Spring. 2 credits. S-U grades optional. Prerequisite:
TXA 432 or permission of instructor.
T 2:30-4:25; C. C. Chu.
Focuses on chemical, physical, and biological properties of textiles and the performance of textile materials (including structures for general hospital use and internal or external body use) clinically and in the laboratory. Typical materials include sutures, surgical dressings, elastic stockings, surgical apparel, and prosthetic materials. The impact of governmental regulations is also examined.

446 Apparel Design V: Intermediate Functional Clothing Design Spring. 3 credits. Prerequisites: minimum of three drawing or art courses and TXA 367 or permission of instructor. Offered alternate years. Minimum cost of materials: $80; lab fee, $10.
Through studio problems in apparel design, students will develop their interest in minimum cost of materials: $80; lab fee, $10.
Through studio problems in apparel design, students will develop their interest in available to students who have taken DEA 445. Offered alternate years; not offered fall 1986-87. 1 field trip, approximately $125; minimum cost of materials: $40; lab fee, $10.
Advanced practical theory concerned with the function of clothing. Special current topics in the field will be studied. Students will be engaged in individual or semester-long research projects that result in the design and development of an apparel item. A field trip to industry is planned.

465 Apparel Design V: Product Development and Presentation Spring. 3 credits. Prerequisites: minimum of three drawing or art courses and TXA 367 or permission of instructor. Offered alternate years. Minimum cost of materials: $80; lab fee, $10.
Basic principles of the design process. Students will develop their skills in the areas of design and the apparel-textile industries. Individual projects. Seminars and lectures will require readings.

600 Special Problems for Graduate Students Fall or spring. Credit to be arranged. S-U grades optional. Hours to be arranged. Department faculty. Independent advanced work by graduate students recommended by their chairperson and approved by the head of the department and instructor.

621 Textile-Fiber Evaluation Fall. 3 credits. Prerequisites: TXA 433 or 436 or permission of instructor. S-U grades optional. Offered alternate years. Not offered fall 1986-87.
M W 12:20-2:30; C. Lees.
Study of analytical methods, including electron spectroscopy, scanning and transmission electron microscopy, X-ray analysis, microspheres, X-ray diffraction and stress-strain analysis. Evaluation of the application of these techniques in textile and polymer science.

631 Textiles and Apparel: International Production and Trade Spring. 3 credits. Prerequisites: TXA 331, Econ 361, or permission of instructor. Offered alternate years.
T R 8:30-9:55. S. Hester.
The course will focus on worldwide patterns of production and trade of the textile and apparel industries. Reasons for international trade will be examined, as well as the international environment that
underlies trade in those commodities. Other topics include the international organizations and agreements relevant to textiles and apparel, and the resulting protective trade policies on the part of developed and developing nations.

635 Special Topics in Textiles
Fall or spring. 1–3 credits. Prerequisite: permission of instructor. May not be offered every semester. Hours to be arranged. Staff.

An in-depth study of one or more selected topics in fibers, polymers, or textiles, such as comfort, fabric formation, and flammability. The course content will vary; consult instructor for more details.

[636 Advanced Textile Structure and Properties]
Fall. 3 credits. Limited to first-year graduate students. Prerequisite: TXA 436 or permission of instructor. Offered alternate years; not offered 1986–87.

M W F 10:10 C. C. Chu.
The chemistry and physicochemical properties of natural and synthetic fibers, polyurethanes and other elastomeric materials, high-temperature polymers, and inorganic materials used as textile fibers, and the relationship between their chemistry and functional properties as textile materials. Other topics will include polymerization processes, textile-finishing processes, dyes and dyeing, and degradation of textile materials under environmental conditions.

637 Seminar: Frontiers in Textiles
Fall and spring. 1 credit each term. S-U grades optional. Required every semester of all graduate students in textiles. Open to advanced undergraduates who have permission of instructor.

T 4:30–5:45. Staff.

New developments, research, and topics of major concern to the field of textiles are discussed by faculty members, students, and speakers from industry, government, and academia. Students participate each semester by writing a paper or giving a public presentation related to their own research or based on published literature.

639 Mechanics of Fibrous Structures
Spring. 3 credits. Prerequisites: TXA 433 or permission of instructor. Offered alternate years.

M W F 10:10 P. Schwartz.

A study of the pioneering research in the mechanics of textile structures: creep phenomena and the dynamic properties of fibers and yarns; idealized yarn and fabric models; creep and stress relaxation data; physical relations in the deformation of yarns and fabrics in tensile, shear, and compression stress; fabric bending and buckling; and the mechanical behavior of nonwoven textile materials.

[648 Standards and the Quality of Life]
Spring. 3 credits. Prerequisites: TXA 346 or permission of instructor. Offered alternate years. Open to advanced undergraduates who have permission of instructor.


M W F 10:10 E. Scott, Ph.D., U. of Michigan.

Prerequisite: permission of instructor. May not be offered every term.

The chemistry and physics of textile materials. Other topics will include consumer protection and environmental aspects; protective trade policies on the part of developed and developing nations.

Anderson, Carol L., Ph.D., Iowa State U. Assoc. Prof., Human Development and Family Studies
Babcock, Robert J., Ed.D., Cornell U. Assoc. Prof., Human Service Studies
Barr, Donald J., Ph.D., Indiana U. Assoc. Prof., Human Service Studies
Battistella, Roger M., Ph.D., U. of Michigan. Prof., Human Service Studies
Bayer, Peter T., Ph.D., U. of Wisconsin. Assoc. Prof., Human Development and Family Studies
Becker, Franklin D., Ph.D., U. of California at Davis. Prof., Design and Environmental Analysis
Beckman, Ronald, Ph.D., Harvard Inst. Assoc. Prof., Design and Environmental Analysis
Biesdorf, Heinzi B., Ph.D., U. of Innsbruck (Austria). Prof., Consumer Economics and Housing
Blyth, Dale A., Ph.D., U. of Minnesota. Asst. Prof., Human Service Studies
Boegly, Carolyn O., M.S., U. of Wisconsin. Assoc. Prof., Cooperative Extension
Boyd, D. Michael, B.A., U. of North Iowa. Assoc. Prof., Design and Environmental Analysis
Brittain, W. Lamberti, Ed.D., Penn State U. Prof., Human Development and Family Studies
Broderw, Margaret J., Ed.D., Cornell U. Assoc. Prof., Consumer Economics and Housing
Bronfrenbrenner, Urie, Ph.D., U. of Michigan. Jacob Gould Schurman Professor, Human Development and Family Studies
Brown, Helen W., Ph.D., Iowa State U. Asst. Prof., Human Service Studies
Brumberg, Joan J., Ph.D., U. of Virginia. Asst. Prof., Human Development and Family Studies
Bryant, W. Keith, Ph.D., Michigan State U. Prof., Consumer Economics and Housing
Bushnell, Allen R., M.F.A., Cranbrook Acad. of Art. Assoc. Prof., Design and Environmental Analysis
Chi, Peter S., Ph.D., Brown U. Assoc. Prof., Consumer Economics and Housing
Chu, Chih-Chang, Ph.D., Florida State U. Assoc. Prof., Textiles and Apparel
Clemhout, Simone, Ph.D., Massachusetts Inst. of Technology. Prof., Consumer Economics and Housing
Cohen, Moncrieff, Ph.D., U. of Michigan. Assoc. Prof., Human Development and Family Studies
Condy, John C., Ph.D., U. of California at Los Angeles. Prof., Human Development and Family Studies
Correllus, Steven W., Ph.D., Pennsylvania State U. Asst. Prof., Human Development and Family Studies
Danko, Sheila, M.D., Rhode Island School of Design. Asst. Prof., Design and Environmental Analysis
Davey, Alice J., Ph.D., Michigan State U. Prof., Consumer Economics and Housing
Doris, John L., Ph.D., Yale U. Prof., Human Development and Family Studies
Eckenrode, John J., Ph.D., Tufts U. Asst. Prof., Human Development and Family Studies
Feldman, Harold, Ph.D., U. of Michigan. Prof. Emeritus, Human Development and Family Studies
Ford, John L., Ph.D., U. of Michigan. Assoc. Prof., Human Service Studies
Gerner, Jennifer, Ph.D., U. of Wisconsin. Assoc. Prof., Consumer Economics and Housing
Greene, Jennifer C., Ph.D., Stanford U. Asst. Prof., Human Service Studies
Hahn, Alan J., Ph.D., Indiana U. Assoc. Prof., Human Service Studies
Harding, John S., Ph.D., Pratt Inst. Prof., Human Development and Family Studies
Heck, Ramona K. Z., Ph.D., Purdue U. Assoc. Prof., Consumer Economics and Housing
Hester, Susan B., Ph.D., Virginia Polytechnic Institute and State U. Asst. Prof., Textiles and Apparel
Hogarth, Jeanne M., Ph.D., Ohio State U. Asst. Prof., Consumer Economics and Housing
Kramer, Carol S., Ph.D., Michigan State U. Asst. Prof., Consumer Economics and Housing
Lazar, Irving, Ph.D., Columbia U. Prof., Human Service Studies
Lee, Lee C., Ph.D., Ohio State U. Assoc. Prof., Human Development and Family Studies
Lemly, Ann T., Ph.D., Cornell U. Asst. Prof., Design and Environmental Analysis
Lust, Barbara C., Ph.D., City U. of New York. Assoc. Prof., Human Development and Family Studies
McClintock, John H., SUNY at Buffalo. Assoc. Prof., Human Service Studies
McLean, W. Jean, M.S., Michigan State U. Prof., Design and Environmental Analysis
McLennan, Claire A., Ph.D., Texas Tech U. Asst. Prof., Human Service Studies
Maynes, E. Scott, Ph.D., U. of Michigan. Prof., Consumer Economics and Housing
Minot, Marion E., Ph.D., Cornell U. Prof., Human Service Studies
Moen, Phyllis, Ph.D., U. of Minnesota. Assoc. Prof., Human Development and Family Studies
Moller, Mueller, Jeanne P., Ph.D., U. of Wisconsin. Prof., Human Service Studies
Noble, Lucinda A., Ph.D. U. of North Carolina. Prof., Human Service Studies
Obendorf, Sharon K., Ph.D., Cornell U. Prof., Design and Environmental Analysis
Ostrander, Edward R., Ph.D., U. of Illinois. Assoc. Prof., Design and Environmental Analysis
Polsak, Patricia B., Ph.D., Syracuse U. Assoc. Prof., Consumer Economics and Housing
Potts, Marion H., Ph.D., Penn State U. Prof., Human Development and Family Studies
Pursch, Emily M., Ph.D., Iowa State U. Prof., Textiles and Apparel
Reschovsky, James D., Ph.D., U. of Michigan. Asst. Prof., Consumer Economics and Housing
Rickel, Helen N., Ph.D., Cornell U. Assoc. Prof., Human Development and Family Studies
Robinson, Jean R., Ph.D., Radcliffe C. Prof., Consumer Economics and Housing
Saltford, Nancy C., Ph.D., Purdue U. Prof., Textiles and Apparel
Savin-Williams, Richard C., Ph.D., U. of Chicago. Assoc. Prof., Human Development and Family Studies
Schuggen, Phil, Ph.D., U. of Kansas. Prof., Human Development and Family Studies
Schwartz, Peter, Ph.D., North Carolina State U. Asst. Prof., Design and Environmental Analysis
Shapiro, Barbara L., Ph.D., Cornell U. Assoc. Prof., Human Service Studies
Sims, William R., Ph.D., Massachusetts Inst. of Technology. Prof., Design and Environmental Analysis
Street, Lloyd C., Ph.D., U. of California at Berkeley. Assoc. Prof., Human Service Studies
Suci, George J., Ph.D., U. of Illinois. Prof., Human Development and Family Studies
Thornton, Michael C., Ph.D., U. of Michigan. Asst. Prof., Human Development and Family Studies
Trochim, William M., Ph.D., Northwestern U. Assoc. Prof., Human Service Studies
Uttermohan-Lovin, Maire, M.D., Columbia U. Assoc. Prof., Human Service Studies
Walker, Elaine F., Ph.D., U. of Missouri. Assoc. Prof., Human Development and Family Studies
Walters, Susan M., M.S., Pennsylvania State U. Assoc. Prof., Human Development and Family Studies
White, M. Vivian, Ph.D., U. of Leeds (England). Prof., Design and Environmental Analysis
White, Leander, Ph.D., Northwestern U. Asst. Prof., Consumer Economics and Housing
Yerk, Betty L., Ph.D., Syracuse U. Assoc. Prof., Human Service Studies
Ziegler, Beate, B.A., U. of Toronto (Canada). Asst. Prof., Textiles and Apparel
Ziegler, Jerome M., M.A., U. of Chicago. Prof., Human Service Studies
Zorn, Peter M., Ph.D., U. of California at Davis. Asst. Prof., Textiles and Apparel
New York State School of Industrial and Labor Relations

Administration
Robert E. Doherty, dean
Lois S. Gray, associate dean, extension and public affairs
David B. Lipsky, associate dean for resident instruction
Jonathan Levy, assistant dean, school relations
James E. McPherson, assistant dean, Office of Student Services
Shirley H. Utter, librarian
Ronald G. Ehrenberg, director, research
Frances Benson, director, publications
Michael Abarbanell, director of budget
Lawrence K. Williams, graduate faculty representative
Donald E. Cullen, editor, Industrial and Labor Relations Review

Degree Program
Industrial and Labor Relations

The School
The School of Industrial and Labor Relations at Cornell (ILR) is a small school within a large university, and it tries to maintain the small-college atmosphere that would be expected of an institution that has about 630 undergraduates and approximately 100 graduate students.

The school is located in a unified complex of classroom buildings, library, and administrative and faculty offices clustered around two courtyards. Daily classroom activities and other school events provide opportunities for students and faculty to interact. ILR students are members of the larger Cornell community and participate fully in its programs.

Almost half of the school's typical freshman class comes from the greater New York City area. Another 30 percent live in other parts of New York State. Students from other states and a few from foreign countries make up the rest of the class. Women constitute about 50 percent of recent entering classes, and minority students comprise 15 percent of new freshmen and transfer students.

Students enrolled in the School of Industrial and Labor Relations at Cornell may take a substantial number of courses in the other six undergraduate colleges and schools of the University, including the College of Arts and Sciences. Cornell students have access to all of the libraries and other services of the University.

The school operates in four areas: (1) resident instruction, (2) extension and public service, (3) research, and (4) publications. It provides instruction to undergraduates and graduate students who are preparing for careers in the field, as well as to men and women already engaged in industrial relations activities and the general public through its Extension and Public Service Division.

The school's Conference Center, part of the extension division, initiates and hosts conferences covering the full scope of industrial and labor relations. The center provides continuing education and information to practitioners and scholars.

The Research Division develops materials for resident and extension teaching and originates studies in industrial and labor relations. The Publications Division publishes and distributes the research results.

Departments of Instruction
Courses in the school are organized into six departments:

- Collective Bargaining, Labor Law, and Labor History
- Industrial and Labor Relations
- Economics and Statistical Analysis
- International and Comparative Labor Relations
- Labor Economics
- Organizational Behavior

Economic and Social Statistics includes the principles of statistical reasoning, statistical methods, and the application of statistical tools of analysis.

International and Comparative Labor Relations is concerned with industrial and labor relations developments in other countries, both industrialized and less developed.

Labor Economics deals with analysis of the labor force, labor markets, wages and related terms of employment, income distribution, unemployment, health and safety in industry, and retirement.

Organizational Behavior investigates human behavior in organizations through psychology and sociology. Courses treat individual human behavior, organizations in society, and industrial society.

Personnel and Human Resource Studies examines the efforts of work organizations to recruit, train, compensate, and manage their members, as well as public policy and programs concerning employability, employment, and income of workers.

A full list of required and elective courses is available from the Office of Student Services, 101 Ives Hall.

Resident Instruction
This division conducts the on-campus programs leading to the degrees of Bachelor of Science, Master of Industrial and Labor Relations, Master of Science, and Doctor of Philosophy from Cornell.

Office of Student Services
Staff members from the Office of Student Services, 101 Ives Hall, work closely with faculty and faculty committees to administer degree programs for the school and many of the school's support services. The office's responsibilities include the admitting and orienting of new students, maintaining students' personal and academic records, and counseling students on personal and academic problems. The office also works closely with seniors who are planning graduate study.

Counseling and Advising
New students will be provided advising on orientation, academic procedures, and course registration by counselors in the Office of Student Services.

Each of the school's academic departments names one or more of its members to serve as advisers for students who wish to consult with them regarding course selection, career possibilities in the field, postgraduate programs, or similar matters. Questions or issues related to graduation requirements, course registration, and related academic procedures should be raised with counselors in the Office of Student Services.

Minority Students
Cornell University administers a variety of special opportunity programs designed to provide financial assistance and other forms of assistance to (1) minority students and (2) low-income students meeting program guidelines. The purpose of these programs is to open access to a Cornell education for capable students who otherwise might not secure the admissions consideration, financial assistance, or supportive services necessary for their success at the University. Participation is also available to those residing outside New York State. For details, prospective students should consult the section "Minority and Special Opportunity Programs" in Introducing Cornell or contact ILR Admissions.

Study Options
Several study options are open to ILR undergraduates, making it possible to tailor a program to fit special circumstances.

One such option is the five-year ILR master's degree. With early planning, some students may earn the M.S. degree in the fifth year. Using another option, some ILR students arrange for dual registration in the Johnson Graduate School of Management, earning their bachelor's degree in ILR and a master's degree in the Johnson Graduate School of Management after five years of study.

Some students elect to spend a semester in New York City, Army, or Washington, D.C., with a chance to observe actual labor problem solving as interns in congressional offices, labor organizations, personnel offices, and state and federal agencies. For more information, see "Special Academic Programs," which follows the next section.

A number of ILR courses deal directly with today's problems and involve fieldwork in the tri-area and elsewhere in New York State.

The ILR program allows juniors and seniors who want to conduct their own research to receive credit for individually directed studies if the program is supervised by a faculty member.

Study in Absentia
Registration in absentia enables a student to seek admission in another American institution for a semester or a year and transfer credit toward completion of the Cornell degree. This study option requires the development of a plan of study, a statement of appropriate reasons for study away from the University (e.g., availability of courses not offered at Cornell), good academic standing, approval of the plan by the director of student services, and payment of a special in absentia registration fee. Course work taken in absentia is usually not evaluated for transfer credit until the work has been completed and the student has returned to the school. Students then submit a course syllabus and other evidence of content to the chairman of the department that might have offered the respective course, or to a counselor in the Office of Student Services if the course is more appropriate as a general elective.

Leave of Absence or Withdrawal
If a student desires to withdraw or to take a leave of absence from the University, an interview should be scheduled with a counselor in the Office of Student Services. Counselors will assist students in petitioning for approval of a leave of absence.

Requirements for Graduation
To earn the Cornell Bachelor of Science degree in industrial and labor relations, the student needs to successfully complete 120 credits. Normally, this requires eight terms, although some students finish their studies in a shorter time.

Required Courses
(55 credits)

The curriculum prescribes the courses and subjects listed in the table below, to be taken in the terms
indicated during the freshman, sophomore, and junior years. In the senior year, all courses will be electives.

Course or Subject | Credits | Term
--- | --- | ---
Freshman Year
Freshman Seminars* | 6 | Fall and spring
Econ 101 – 102, Micro- | 6 | Fall and spring
Macroeconomics* | 3 | Fall
Psych 101, Introduction to Psychology* | 4 | Spring
ILR 100, History of Industrial Relations in the United States | 3 | Spring
ILR 120, Macro Organizational Behavior and Analysis | 3 | Spring
ILR 211, Statistics I | 4 | Spring
Any two of the following: ILR 101, Special Studies in the History of Industrial Relations in the United States | 3 | Spring
ILR 140, Development of Economic Institutions | 3 | Spring
ILR 121, Micro Organizational Behavior and Analysis | 3 | Spring
Physical education | 0 | Fall and spring
Sophomore Year
ILR 201, Labor Relations Law and Legislation | 3 | Fall
ILR 240, Economics of Wages and Employment | 3 | Fall
ILR 211, Statistics II | 3 | Fall
ILR 260, Personnel Management | 3 | Fall
ILR 200, Collective Bargaining | 3 | Spring
Ag Econ 221, Accounting and Financial Management | 3 | Spring
ILR 101 or ILR 140 or ILR 121 | 3 | Spring
Junior Year
ILR 340, Economic Security | 3 | Fall
*College of Arts and Sciences

Elective Courses
(65 credits)
From the courses offered by the school, students must select a minimum of 27 credits of ILR elective courses. No more than 8 of these credits may be satisfied by I&LR 497 - 498, Internships, or I&LR 495, Honors Program.

Undergraduates are expected to select one course in the humanities and one intensive writing course (each for a minimum of three credits) from a list of designated courses to be completed during the sophomore, junior, or senior years.

The remaining 33 credits may be selected from the courses of any other college at Cornell, but a student who takes more than 33 credits in the endowed colleges (College of Architecture, Art, and Planning; College of Arts and Sciences; Johnson Graduate School of Management; College of Engineering; and School of Hotel Administration) will be billed for the additional tuition at the current cost per credit.

The number of credits that may be taken in the endowed colleges at no additional cost to the student will be changed at any time by official action of the school.

Scheduling and Attendance

Schedule Changes
Occasionally it may be necessary for a student to request changes in his or her course schedule either before a term begins or during the semester. Such requests must be directed to the Office of Student Services in order to avoid possible loss of academic credit.

Class Attendance
It is each student’s responsibility to attend all scheduled classes unless approved excuses have been given by the faculty. In some courses an instructor may permit a maximum number of class absences without a grade penalty or dismissal from the course. An explanation for absence from class may occasionally be secured from the Office of Student Services in advance of the expected absence. An approved absence may be warranted by:
1) participation in authorized University activities such as athletic events, dramatic productions, or debates;
2) medical problems supported by a record of clinic or infirmary treatment;
3) serious illness or death in the immediate family;
4) other circumstances beyond the student’s control.

A request for explanation of an absence should, when possible, be made to the Office of Student Services before the date of expected absence. A reported and explained absence does not relieve a student from fulfillment of academic requirements during the period of absence. The course instructor has the authority to determine what work must be completed. The office can only confirm the explanation for absence. Students should inform the Office of Student Services of any problems they have meeting course requirements.

Academic Standing and Grades

Academic Integrity
In 1977 the faculty of the School of Industrial and Labor Relations approved a revised code of academic integrity. This code, while based on the Cornell University code, varies somewhat.

Absolute integrity is expected of all Cornell students in all academic undertakings. They must in no way misrepresent their work, fraudulently or unfairly, advance their academic status, or be a party to another student’s failure to maintain academic integrity. The code specifically prohibits:
1) knowingly representing the work of others as one’s own;
2) using or obtaining unauthorized assistance in any academic work;
3) fabricating data in laboratory or field work.

Full details on the applications of those prohibitions to course work, term papers, examinations, and other situations are listed in the code. Copies are available from the Office of Student Services, 101 Ives Hall.

Dean’s List
A Dean’s List is compiled for each of the four undergraduate classes each term on the seventh day following receipt of final grades from the registrar. Eligibility for the Dean’s List is determined by applying all of the following criteria:
1) achievement of a term average for freshmen of 3.3 or better; for sophomores of 3.4 or better; and for juniors and seniors of 3.6 or better;
2) a minimum course load for the term of 12 letter-graded credits;
3) completion of all courses registered for at the beginning of the term;
4) satisfaction of all good-standing requirements.

Academic Standing
Good standing requires that all of the following criteria be met at the end of each term:
1) an average of C - (1.7) for the semester’s work, including a minimum of 8 completed and graded credits;
2) no failing grades in any course, including physical education;
3) a cumulative average of C - (1.7) for all completed terms.

If at the end of any term a student fails to maintain good standing or if overall academic performance is so marginal as to endanger the possibility of meeting school and University degree requirements, his or her record is reviewed by the Committee on Academic Standards and Scholarships. The committee may issue a written warning to the student at that time.

Involuntary Separation from the School for Academic Reasons
A student may be denied permission to reregister at the end of any term when he or she has failed:
1) to establish good standing after a semester on warning;
2) to maintain an average of 1.7 in any term after a previous record of warning;
3) to achieve good standing after being on warning any two previous semesters;
4) two or more courses in one term or has a term average of 1.0 or below.

The Academic Standards and Scholarship Committee may decide to permit a student to remain on warning for more than one semester if there has been significant improvement even though the cumulative average is still below 1.7.

S-U Grading Policy
An undergraduate may register to receive a final grade of S (Satisfactory) or U (Unsatisfactory) in courses that offer this option—either in the school or in other divisions of the University—subject to the following conditions:
1) the S-U option may be used in ILR and in out-of-college course electives only, not in directed studies;
2) students are limited to registering in two S-U courses a term;
3) S-U registration is limited to 4 credits for each course;
4) students registering for S-U grades must be in good standing;
5) students must fulfill the graduation requirement of 105 letter-graded credits.

ILR faculty members assign a grade of U for any grade below C – and a grade of S for any grade of C – or better. A grade of U is considered equal to an F in determining a student’s academic standing, although it is not included in the cumulative average.

No change of grading (from letter to S-U or from S-U to letter) may be made after the first three weeks of classes. There are no exceptions to this restriction, and appeals will not be accepted.

Incomplete Grades
An Incomplete (INC) is a grade assigned when the course has not been completed for reasons that are acceptable to the instructor. It is understood that the work may be completed later and credit given. Instructors may grant an Incomplete grade for a limited number of clearly valid reasons, but only to students with substantial equity in a course. A firm and definite agreement on the conditions under which it may be made up must be made with the instructor. The school’s policy allows a maximum of two full terms of residence for removal of an Incomplete. An Incomplete grade not made up within this time automatically becomes an F.

Special Academic Programs
In order to meet the special academic objectives of some students, the school’s faculty has established several special academic programs. For additional information, students should contact a counselor in the
Office of Student Services. Counselors will explore the program with students to help them decide if it suits their interests.

Dual Registration in the Johnson Graduate School of Management
Dual informal registration in the Johnson Graduate School of Management leads to a Bachelor of Science degree in industrial and labor relations and a master’s degree in management after five years of study and is open to students who meet the requirements of the Johnson Graduate School of Management.

Early planning by each student, preferably in the sophomore year, is desirable to ensure that the expectations of the Johnson Graduate School of Management and ILR curriculum requirements are fulfilled. Students interested in the very limited and selective program of the Johnson Graduate School of Management should contact the Admissions Office, 319 Malott Hall, and a counselor at the Office of Student Services.

Five-Year Master of Science Degree Program
With early planning it is possible to earn the M.S. degree in a fifth year of study. This program is designed specifically for those who wish concentrated study in an area of specialization in the school for a Master of Science degree. Students considering this program should consult a counselor in the Office of Student Services after their freshman year.

Internships
The Credit Internship Program has provided students with a vivid understanding of problems in labor and industrial relations through observation and participation in "real-life" labor problem solving. A number of selected students spend a term of the junior year in Albany, New York City, or Washington, D.C., in close contact with practitioners. Their activities include independent research under direction of ILR faculty members and seminars drawing on fieldwork experience with employers, labor organizations, and government agencies. More information about this program is available from the Office of Student Services.

Study Abroad
Cornell students with strong academic records and the necessary preparation in required and elective courses are encouraged to consider study abroad. The University currently has agreements with universities in Germany, Israel, England, and the Scandinavian countries that permit undergraduates to register for courses while maintaining Cornell registration and financial aid for a semester or a year. Information about those opportunities may be requested from Cornell Abroad, in the Center for International Studies, 170 Uris Hall.

Some study abroad programs require the development of language proficiency and preparation in appropriate courses at Cornell. Students should consult the Office of Student Services and Cornell Abroad in the freshman and sophomore years to be sure that they comply with the academic and procedural requirements for study abroad.

Collective Bargaining, Labor Law, and Labor History


100 History of Industrial Relations in the United States
Fall or spring. 3 credits. N. C. Daniel, T. Deviatt, G. H. Stavore. This review of American labor history emphasizes the twentieth century. The course concentrates on American workers, their labor movements, and the forces that have shaped industrial relations in the United States. Readings are selected from scholarly accounts and original sources.

101 Special Studies in the History of Industrial Relations in the United States
Fall or spring. 3 credits. Prerequisite: I&LR 100 for ILR students; no prerequisite for out-of-college students. C. Daniel, I. Deviatt, G. Korman, N. Salvatore. Several historians will offer undergraduate courses: Labor between the Wars, Labor and the Left, Immigrant Workers, Workers and Wars of the Twentieth Century, and about other periods and themes of American labor history.

200 Collective Bargaining
Fall or spring. 3 credits. J. Burton, D. Cullen, H. Katz, D. Lipsky, P. Ross, R. Seiber. A comprehensive study of collective bargaining; the negotiation and scope of contracts; the day-to-day administration of contracts; the major substantive issues in bargaining, including their implication for public policy, and the problem of dealing with industrial conflict.

201 Labor Relations Law and Legislation
Fall, spring, or summer. 3 credits. T. Crivens, M. Gold, J. Gross, R. Lieberwitz. A survey of the law governing labor relations. The legal framework in which the collective bargaining relationship is established and bargaining takes place is analyzed. Problems of the administration and enforcement of collective agreements are considered, as are problems of protecting individual employee rights in the collective labor relations context. Also serves as an introduction to the legal system and method and to legal and constitutional problems of governmental regulation of industrial and labor relations.

301 Labor Union Administration
Fall. 3 credits. Prerequisites: I&LR 100 and 201. G. Brooks, R. Seiber. Study and analysis of the structure and operations of American unions, including the complicated internal life of the organizations: the varied environments in which unions develop and grow or decline; the relationship of national unions, local unions, and members in the different aspects of internal union government; the ways in which unions are set up to handle organizing, collective bargaining, contract administration, and political activity; and the widespread movement toward merger and consolidation of unions that began in the sixties and continues today. All of these will involve a study of union constitutions and other primary documents, in addition to secondary readings. Attention will be given to relevant legislation, current problems of unions, and the eternal problems of attaining union democracy.

303 Research Seminar in the Social History of American Workers
Fall or spring. 4 credits. Limited to upperclass students who have demonstrated their ability to undertake independent work and who have received permission of the instructor. G. Korman. An examination of a different subject each year.

304 Seminar in the History, Administration, and Theories of Industrial Relations in the United States
Fall or spring. 4 credits. Prerequisite: permission of instructor. C. Daniel, K. Katz, N. Salvatore. Designed to explore the social, economic, and political background of industrial relations in the history of the United States. Examines a different subject each year.

305 Labor in Industrializing America: 1865–1920
Fall. 3 credits. Prerequisite: I&LR 100 and 101. G. Korman. Examines the experience of working people in the years between the Civil War and World War I. It will explore both the workers themselves—their organization, diverse cultures, ethnic and racial traditions, and political affiliations—and the dramatic changes in industry that restructured American life during this period.

381 Jewish Workers in Europe and America, 1789–1948
Spring. 4 credits. Open to sophomores, juniors, and seniors. G. Korman. This course in comparative history examines the complex experiences of the Yiddish-speaking immigrant workers and their families. A special subject of interest is the extraordinary history of the Jewish working classes between 1924 and 1948.

382 American Capitalists and Workers: 1840–1985
Fall. 4 credits. G. Korman. This social history of economic affairs and institutions examines the subjects of work and labor from the perspective of American business. In particular, the course focuses upon corporate capitalists in their capacities as profit seekers, employers of segmented workers, managers of production and distribution, and citizens of the republic.

400 Union Organizing
Spring, weeks 1–7. 2 credits. 2 meetings each week. D. Cullen, R. Donovan. This course explores various aspects of unions' attempts to organize workers: why some workers join unions and others do not; the techniques used by both unions and employers during organizing campaigns; and the present law of organizing and proposed amendments to that law. Includes an examination and a research paper.

404 Contract Administration
Fall, weeks 1–7. 2 credits. Prerequisites: undergraduates, I&LR 200 and 201; graduate students, I&LR 500 and 501. R. Seiber. This course bridges the gap between I&LR 200 (500), Collective Bargaining, and I&LR 602, Arbitration. It focuses on various aspects of the dispute resolution process prior to final resolution. The intent of the course is to expand the knowledge of students rather than to develop personal skills. It includes such topics as (1) the history and development of contractual grievance process, (2) the merits of various alternative processes that have been adopted by unions and management in the United States, (3) the impact of external law on the behavior of the parties in the adjustment process, (4) a comparison of the U.S. system with systems in other industrialized economies, (5) current issues and problems in the systems, (6) nonunion grievance processes, and (7) ongoing experimental alternatives to the standard systems.

406 History of the Black Worker in the United States
Fall. 3 credits. Prerequisite: I&LR 100. G. Gross. Intended to introduce the student to the history of the black worker in the United States through a review and analysis of the existing literature of black labor history and through source documents from the National Archives. Discussions will center around the black worker in agriculture, industry, and government; black worker migrations; black workers and organized labor; and black workers, discrimination, and the law.

407 Contemporary Trade Union Movement
Fall. 3 credits. Prerequisites: I&LR 100 or 502, upperclass standing. N. Salvatore. An examination of contemporary trade union issues in the context of labor’s history since World War II. Among the issues to be discussed are centralization of union power, union democracy, political action, and strategies.
of collective bargaining. A series of speakers from the union movement will address the class. Midterm, final, and term paper are required.

495 Honors Program Fall and spring (yearlong course). 3 credits each term. Admission to the ILR senior honors program is obtained under the following circumstances: (a) students must be in the upper 20 percent of their class at the end of their junior year; (b) an honors project, entailing research leading to completion of a book, must be proposed to an ILR faculty member who agrees to act as thesis supervisor; and (c) the project, endorsed by the proposed faculty sponsor, is submitted to the Committee on Academic Standards and Scholarships. Accepted students embark on a two-semester sequence. Their responsibilities consist of determining a research design, familiarization with German socialist literature, and preliminary data collection. The second semester involves completion of the data collection and preparation of the honors thesis. At the end of the second semester, the candidate is examined orally on the completed thesis by a committee consisting of the thesis supervisor, a second faculty member designated by the operating department chairman, and a representative of the Academic Standards Committee.

497-498 Internship Fall or spring. 497, 3 credits; 498, 6 credits.

Staff

All requests for permission to register for an internship must be approved by the faculty member who will supervise the project and the chairman of the faculty member's department before submission for approval by the Committee on Academic Standards and Scholarship. Upon approval of the internship, the Office of Student Services will register each student for 497, for 3 credits graded A+ to F for individual research, and for 498, for 6 credits graded S-U, for completion of a professionally appropriate learning experience, which is graded by the faculty sponsor.

499 Directed Studies Fall or spring. 3 credits.

For individual research, conducted under the direction of a member of the faculty, in a special area of labor relations not covered by regular course offerings. Registration is normally limited to seniors who have demonstrated ability to undertake independent work. Eligible students should consult a counselor in the Office of Student Services at the time of course registration to arrange for formal submission of their projects for approval by the Academic Standards Committee.

500 Collective Bargaining Fall or spring. 3 credits. Open only to graduate students. Recommended: ILR 501 taken previously or concurrently.

D. Cullinan, H. Katz, D. Lipsky, H. Seeger.

A comprehensive study of collective bargaining, with special emphasis on philosophy, structures, process of negotiations, and administration of agreements. Attention is also given to problems of handling and settling industrial controversy, the various substantive issues, and important developments and trends in collective bargaining.

501 Labor Relations Law and Legislation Fall, spring, or summer. 3 credits.

T. Crivens, M. Gold, J. Gross, R. Lieberwitz.

A survey and analysis of the labor relations law that examines the extent to which the law protects and regulates concerted action by employees in the labor market. The legal framework within which the collective bargaining takes place is considered and analyzed. Problems of the administration and enforcement of the collective agreement are considered, as are problems of protecting the individual member-employee rights with the union.

502 History of Industrial Relations in the United States since 1865 Fall or spring. 3 credits.

C. Daniel, G. Korman, N. Salvatore.

This introductory survey course emphasizes events in the twentieth century. Special studies include labor union struggles over organizational alternatives and such other topics as industrial conflicts, working-class life styles, radicalism, welfare capitalism, unions, democracy, and the expanding authority of the federal government.

600 Advanced Seminar in Labor Arbitration Spring. 3 credits. Limited to juniors, seniors, and graduate students. Prerequisite: ILR 602 or equivalent and permission of instructor.

J. Gross.

An advanced seminar in labor arbitration emphasizing the practical aspects of current labor arbitration techniques and problems. Subjects considered range from the preparation of labor arbitration, the preparation of prehearing and posthearing briefs, and the writing of an arbitration opinion and award, to the investigation and evaluation of the experience of labor arbitrators, with selected case problems arising in state and federal employment and public education as well as in the private sector.

601 The Bargaining Process: Theory and Practice Fall. 3 credits. Prerequisite: ILR 200 or 500.

D. Lipsky.

Focus is on theories of the bargaining process, including economic, behavioral, game-theoretic, political, and social-psychological approaches to the bargaining problem. Will consider union wage policy, particularly the formulation of union goals in bargaining. Union and management preparation for negotiations, bargaining strategies and tactics, and bargaining power are some of the facets of the bargaining process that will be discussed. Attempts at empirical verification of various bargaining theories will also be considered. Theoretical and analytical principles will be developed in assigned readings and class discussions. The application and practical relevance of these principles will be explored through mock negotiations and other exercises.

602 Arbitration Fall or spring. 4 credits. Limited to 21 students. Prerequisites: undergraduates, ILR 200, graduate students, ILR 500, permission of instructor. J. Gross.

A study of the role and function of arbitration in the field of labor-management relations, including an analysis of principles and practices, the law of arbitration, the handling of materials in briefs or oral presentation, the conduct of an arbitration hearing, and the preparation of an arbitration opinion.

603 Governmental Adjustment of Labor Disputes Fall or spring. 3 or 4 credits. Prerequisites: undergraduates, ILR 200; graduate students, ILR 500.

D. Cullinan.

An examination of the various governmental techniques for dealing with labor disputes in both the private and public sectors, including mediation, fact-finding arbitration (both voluntary and compulsory), the use of injunctions, and seizure. The course also examines the application of these techniques under the Railway Labor Act, Taft-Hartley Act, and various state acts.

604 Readings in the Literature of American Radicalism and Dissent Fall or spring. 3 credits. Prerequisites: undergraduates, ILR 200; graduate students, ILR 500.

J. Gross.

Each term, concentration is on a different historical aspect of American radicalism and dissent.

605 Readings in the History of Industrial Relations in the United States Fall. 3 credits. Limited to seniors and graduate students.

C. Daniel, G. Korman, N. Salvatore.

A seminar covering, intensively, original printed sources and scholarly accounts for different periods in American history.

606 Theories of Industrial Relations Systems Fall or spring. 3 credits. Limited to seniors and graduate students. Prerequisites: seniors, ILR 100 and 101; graduate students, ILR 502.

C. Daniel, H. Katz, G. Korman.

An examination of the leading theories concerning the course, forms, causes, and consequences of labor relations, including the functional, behavioral, game-theoretic, political, and social-psychological approaches to the bargaining problem. Will consider union wage policy, particularly the formation of union goals in bargaining. Union and management preparation for negotiations, bargaining strategies and tactics, and bargaining power are some of the facets of the bargaining process that will be discussed. Attempts at empirical verification of various bargaining theories will also be considered. Theoretical and analytical principles will be developed in assigned readings and class discussions. The application and practical relevance of these principles will be explored through mock negotiations and other exercises.

607 Arbitration and Public Policy Spring. 3 credits. Limited to 10 ILR students and 10 law students. Prerequisite: ILR 201 and permission of instructor. J. Gross.

Labor arbitration in the public and private sectors. Students will write research memoranda, briefs, and arbitration opinions on various substantive and procedural topics. Forty to fifty pages of written work will be expected. There will also be opportunity to participate in simulated arbitration proceedings.

608 Special Topics in Collective Bargaining, Labor Law, and Legislation Fall or spring. 3 credits. Prerequisites: undergraduates, ILR 201; graduate students, ILR 502.

Staff.

The areas of study are determined each semester by the instructor offering the seminar.

609 Law of Workers' Compensation Fall or spring. 4 credits. Prerequisite: ILR 201 or 501 or permission of instructor.

J. Burton.

An examination of the legal aspects of workers' compensation, the program that provides cash benefits, medical care, and rehabilitation services to workers disabled by work-related injuries and diseases. Includes a brief introduction to the disability benefits provided by the Social Security program and to negligence suits by injured workers.

651 Industrial Relations in Transition Spring. 3 credits. Limited to seniors and graduate students. H. Katz.

Students will write research memoranda, briefs, and arbitration opinions on various substantive and procedural topics. Forty to fifty pages of written work will be expected. There will also be opportunity to participate in simulated arbitration proceedings.

655 Employment Law Spring. 3 credits. Prerequisite: undergraduates, ILR 201; graduate students, ILR 501.

M. Gold, C. Gramm, J. Burton.

This course will examine a number of major federal and state laws designed to protect workers in their employment relationships. The historical and theoretical rational for the Social Security program and to negligence suits by injured workers.

656 Employment Law Spring. 3 credits. Prerequisite: undergraduates, ILR 501; graduate students, ILR 501.

M. Gold, C. Gramm, J. Burton.

This course will examine a number of major federal and state laws designed to protect workers in their employment relationships. The historical and theoretical rational for the Social Security program and to negligence suits by injured workers.

660 Problems in Union Democracy Fall or spring. 3 credits.

M. Gold, R. Ross.

Students will write research memoranda, briefs, and arbitration opinions on various substantive and procedural topics. Forty to fifty pages of written work will be expected. There will also be opportunity to participate in simulated arbitration proceedings.

661 Industrial Relations in Transition Spring. 3 credits. Limited to seniors and graduate students. H. Katz.

Consider whether recent developments such as concession bargaining, worker participation programs, and the growth of nonunion firms represent a fundamental transformation in industrial relations practice. Will review recent research and new theories arguing that such a transformation is occurring, including the work of Piore and Sabel, Bluestone and Harrison, and Kochan, McKie, and Katz. Will also review the counterarguments and evidence put forth by those who believe no such transformation is under way. Course material will focus on industrial relations practice in the private sector in the United States, although some attention will be paid to developments in the Western Europe, the United Kingdom, and Japan.

665 Employment Law Spring. 3 credits. Prerequisite: undergraduates, ILR 201; graduate students, ILR 501.

M. Gold, C. Gramm, J. Burton.

This course will examine a number of major federal and state laws designed to protect workers in their employment relationships. The historical and theoretical rational for the Social Security program and to negligence suits by injured workers.

666 Problems in Union Democracy Fall or spring. 3 credits.

M. Gold, R. Ross.

Students will write research memoranda, briefs, and arbitration opinions on various substantive and procedural topics. Forty to fifty pages of written work will be expected. There will also be opportunity to participate in simulated arbitration proceedings.
Unions are considered as an example of private government, and union democracy is examined by standards and customary practices in both public and private governments. Included are such elements as elections, self-government by majority, and rights of minorities; the judicial process, including impartial review; local-national relationships; and the resolution of negotiating impasses. Individual and group research projects will be required.

681 Labor Relations Law  Spring. 3 credits. Prerequisites: l&LR 201 or 501 or equivalent. M. Gold, R. Lieberwitz.
An advanced course in labor law, concentrating on problems of administering the National Labor Relations Act; the Landrum-Griffin Act; Title VII of the Civil Rights Act of 1964 as amended; the Fair Labor Standards Act, as amended; the Equal Pay Act; the Age Discrimination in Employment Act; the Occupational Safety and Health Act; and state workers' compensation and unemployment insurance systems.

682 Seminar in Labor Relations Law and Legislation  Fall or spring. 3 credits. Limited enrollment. Prerequisite: permission of instructor. R. Lieberwitz.
Legal problems in public employment and other areas of labor relations affecting the public interest.

683 Research Seminar in the History of Industrial Relations  Fall or spring. 3 credits. Prerequisites: undergraduates, l&LR 100 and 101; graduate students, l&LR 502.
G. Brooks, C. Daniel, G. Korman, N. Salvatore. The areas of study are determined each semester by the instructor offering the seminar.

684 Employment Discrimination and the Law  Fall or spring. 4 credits. Prerequisites: l&LR 201 or 501 or equivalent. T. Crivens, M. Gold.
An examination of legal problems involving employment discrimination based on race, color, religion, sex, national origin, or age. The impact of developing principles of law on preemployment inquiries and testing, seniority and promotions, and other personnel policies, practices, and procedures are discussed. The requirements of affirmative action under Executive Order 11246, as amended, are analyzed. Special attention is given to the role of law in resolving employment disputes and the procedural framework for raising and adjudicating such claims before administrative agencies and the courts.

685 Collective Bargaining in Public Education  Spring. 3 credits. Limited enrollment. Prerequisite: permission of instructor. R. Doherty.
The seminar consists of a study of the legal, financial, administrative, and educational problems raised by collective bargaining in the public schools. Major attention will be directed at existing statutes covering the employment arrangement for public school employees, the content and the administration of collective agreements, the ideological postures of teacher organizations, and the resolution of negotiating impasses. Individual and group research projects will be required.

686 Collective Bargaining in the Public Sector  Fall or spring. 3 credits. Prerequisites: undergraduates, l&LR 200 and 201; graduate students, l&LR 500 and 501.
An examination of the development, practice, and extent of collective bargaining between federal, state, and local governments and their employees. The variety of legislative approaches to such matters as representation rights, unfair practices, scope of bargaining, procedures, and the strike against government are considered along with implications of collective bargaining for public policy and its formulation.

687 Current Issues in Collective Bargaining  Fall or spring. 3 or 4 credits. Limited to 25 students. Prerequisite: l&LR 200 or 500, and permission of instructor. D. Colen, D. Lipsky, P. Ross.
An intensive study of the most significant current issues and problems facing employers and unions in their relations with each other, with particular emphasis on the theoretical analyses in contract negotiations and administration of the provisions of collective bargaining agreements. A major research paper is usually required.

688 The Political Economy of Collective Bargaining  Fall. 3 credits. Prerequisites: undergraduates, l&LR 200 and 240; graduate students, l&LR 500 and 540, or permission of instructor. Focuses on both the economic analysis of unions and collective bargaining in our economy and on the economic forces that affect collective bargaining. The method is to identify and conceptualize the structural determinants of relative bargaining power. Examines both the economic outcomes of collective bargaining and current bargaining trends in a variety of industries. Topics include neoclassical and structural-institutionalist analyses of union power; the effect of unions on compensation, productivity, prices, and income inequality; union growth and strikes; pattern setting and bargaining structures; multinational and complementarities of collective bargaining; the decline of union bargaining power; unions and inflation; and concession bargaining. Approximately half the course is spent on case studies of collective bargaining in various industries (auto, steel, construction, etc.) in the private sector. A term paper is required. Topics are covered in a nonstatistical fashion.

689 Constitutional Aspects of Labor Law  Spring. 3 credits. Prerequisite: l&LR 201 or 501 or equivalent. T. Crivens, M. Gold.
In-depth analysis of the Supreme Court decisions that interpret the United States Constitution as it applies in the workplace. This study will focus on the First Amendment, Fifth Amendment, Fourteenth Amendment, and Commerce Clause, with issues including freedom of speech and association, equal protection, due process, and other issues in the area of political and civil rights. The course entails a high level of student participation in class discussion, and assignments include a research paper.

703 Theory and Research in Collective Bargaining  Spring. 3 credits. Open to graduate students who have had l&LR 500 and 723 or their equivalents. Recommended: a statistics course beyond the level of l&LR 510.
1. D. Lipsky, R. Sebeer.
This is a second-level course in collective bargaining that builds on the institutional research covered in l&LR 500. The existing literature in the area of collective bargaining is appraised for its theoretical and empirical content. Efforts are made to explore the appropriate role for theory and empirical analysis in moving research in collective bargaining toward a more analytical perspective and to identify and appraise the underlying paradigms used to study collective bargaining-related issues.

705 The Economics of Collective Bargaining  Spring. 3 credits. Prerequisites: undergraduates, l&LR 500; graduate students, l&LR 540 (or their equivalents) and an understanding of multiple regression analysis, or permission of instructor. H. Katz, D. Lipsky.
Focuses on both the economic analysis of unions and collective bargaining in our economy and on the economic forces that affect collective bargaining. The method is to identify and conceptualize the structural determinants of relative bargaining power. On this basis, the course examines both the economic outcomes of collective bargaining and current bargaining trends in a variety of industries. Tentative theoretical analyses of unionism (neoclassical, institutionalist) are compared. The statistical techniques and empirical results of research on the union effect on economic outcomes (wages, prices, inflation, profits, productivity, earnings inequality) are also evaluated. The effects of technology, corporate structures, and public policy on union bargaining power is outlined, and a number of case studies of collective bargaining in the private sector are reviewed. A term paper is required.

798 Internship  Fall or spring. 1-3 credits.
Designed to grant credit for individual research under the direction of a faculty member. Graduate students who have completed a specified internship are required to register for 798 in the semester of their internship. All requests for permission to register for I & LR 798 must be approved by the faculty member who will supervise the project.

799 Directed Studies  Fall or spring. Credit to be arranged.
For individual research conducted under the direction of a member of the faculty.

980 Workshop in Collective Bargaining, Labor Law, and Labor History  Fall and spring. 2 credits. Enrollment limited to M.S. and Ph.D. candidates in the department. S-U grades only.
Staff.
This workshop is designed to provide a forum for the presentation of current research being undertaken by faculty members and graduate students and invitations to guest lectures. Department of Collective Bargaining and by invited guests. All M.S. and Ph.D. candidates in the department who are at work on their theses are strongly urged to enroll. Each student in the course will be expected to make at least one presentation during the year, focusing on the formulation, design, execution, and results of that student's thesis research.

Economic and Social Statistics

P. McCarthy, chairman; I. Blumen, A. Hadi, P. Velleman

210 Statistics (Statistical Reasoning)  Fall or spring. 4 credits. Not open to engineering or graduate students. Attendance at the first discussion section of the term is essential.
An introduction to the basic concepts of statistics: measures of location and dispersion, estimation and confidence intervals, hypothesis tests, regression and correlation. Students are taught to use a computer at the beginning of the term and use it for weekly assignments.

211 Economic and Social Statistics  Fall. 3 credits. Prerequisite: l&LR 210 or suitable introductory statistics course. Attendance at the first discussion section of the term is essential.
A continuation of l&LR 210. Application of statistical techniques to the social sciences. Topics include statistical inference, simple and multiple regression and correlation, applications of regression, elements of time series analysis, and the design of sample surveys. A computer is used throughout the course. (Students who have taken an introductory course in statistics without a computer will be expected to obtain remedial instruction during the first few weeks of the semester.)

310 Design of Sample Surveys  Spring. 3 credits. Prerequisite: one term of statistics.
Application of statistical methods to the sampling of human populations. A thorough treatment of the concepts and problems of sample design with respect to cost, procedures of estimation, and measurement of sampling error. Analysis of nonsampling errors and their effects on survey results (for example, interviewer bias and response error). Illustrative materials are drawn from such fields as marketing research and attitude and opinion research.

311 Statistics II  Fall. 4 credits. Prerequisite: l&LR 210 or permission of instructor.
An intermediate, nonmathematical statistics course
emphasizing the concepts associated with statistical methods. Includes a treatment of estimation and tests of hypotheses with reasons for choice of various methods and models. Application to problems involving parameters, estimators, and test statistics; correlation coefficients, with an introduction to nonparametric methods, analysis of variance, and multiple regression and correlation.

312 Applied Regression Methods Fall. 3 credits. Prerequisite: 1&LR 211 or equivalent. The course starts with a review of those parts of matrix algebra that provide the vocabulary and skill necessary to construct and manipulate linear regression models. The standard least-squares theory is then developed, and regression analysis techniques are applied to problems arising in economics, industry, government, and the social sciences. Computer packages are used as an aid to obtain problem solutions. Additional topics are deviation from assumptions, multicolinearity, variable selection methods, and analysis of variance.

410 Techniques of Multivariate Analysis Fall. 3 credits. Prerequisite: 1&LR 311. The techniques of multivariate statistical analysis, the associated theories, the rationale for choices among techniques, and illustrative applications. Some matrix algebra and related mathematics are introduced. Includes regression, correlation, principle components, multivariate tests on means, variances and covariances, relations between sets of variables, and discriminant analysis.

411 Statistical Analysis of Qualitative Data Spring. 3 credits. Prerequisite: 1&LR 311. L. Blumen. An advanced undergraduate and beginning graduate course. Includes treatment of association between qualitative variables, paired comparisons, rank-order methods, and other nonparametric statistical techniques, including those related to chi-squared.

499 Directed Studies For description, see the section on Collective Bargaining, Labor Law, and Labor History.

510 Introductory Statistics for the Social Sciences Fall or summer. 4 credits. A nonmathematical course for graduate students in the social sciences without previous training in statistical methods. Emphasis is on discussion of technical aspects of statistical analysis and on initiative in selecting and applying statistical methods to research problems. The subjects are designed to cover analysis of frequency distributions, regression and correlation, and selected topics from the area of statistical inference. Students are taught to use a computer at the beginning of the term and use it for weekly assignments.

511 Statistical Methods for the Social Sciences Spring. 3 credits. Prerequisite: 1&LR 510 or an equivalent introductory statistics course. This is a second course in statistics for graduate students that emphasizes applications in the social sciences. Topics include review of simple linear regression, multiple regression (theory, model building, model violations), and analysis of variance. Statistical computing packages are used extensively. Students who have taken an introductory course in statistics without a computer course will be expected to do extensive analysis of real-life data sets as an aid to obtain problem solutions. Additional topics are deviation from assumptions, multicolinearity, variable selection methods, and analysis of variance.

710 Statistical Theory of Measurement-Error Models Fall. 3 credits. Prerequisite: course work in mathematical statistics and regression theory and familiarity with large-sample theory. A survey of the theory and methods dealing with the analysis of measurement-error (errors-in-variables) models. Outside readings cover past and recent work. Topics include functional and structural linear models, the use of matrix algebra and related mathematics are among techniques, and illustrative applications. Some matrix algebra and related mathematics are introduced. Includes regression, correlation, principle components, multivariate tests on means, variances and covariances, relations between sets of variables, and discriminant analysis.

711 Advanced Topics in Linear Regression Spring. 3 credits. Prerequisite: 1&LR 312 or equivalent. This course is an attempt to narrow the gap between the theory and practical application of the linear regression model. Classical and recently developed statistical procedures are discussed. Students will be expected to do extensive analysis of real-life data sets using computer-packaged programs. Topics include regression diagnostics (outliers, leverage points, influential observations), generalized linear models, and multicolinearity.

712 Theory of Sampling Fall. 3 credits. Prerequisite: calculus and at least one semester of mathematical statistics. A companion course to 1&LR 310, Design of Sample Surveys, stressing the development of the fundamentals of sampling theory. Attention is paid to recent progress in the field. Occasional illustrative material is given to indicate the application of the theory.

799 Directed Studies For description see the section on Collective Bargaining, Labor Law, and Labor History.

International and Comparative Labor Relations J. Windmuller, chairman; M. G. Clark, G. Fields, W. Galenson

330 Comparative Industrial Relations Systems: Western Europe Fall. 3 credits (1 additional credit may be arranged with the instructor). Open to juniors and seniors. J. Windmuller. An introduction to contemporary industrial relations in several Western industrialized countries, including Britain, France, West Germany, and Sweden. The emphasis will be on trade unions, employers and their associations, collective bargaining, the role of government, and current policy issues.

331 Comparative Industrial Relations Systems: Non-Western Countries Spring. 3 credits (1 additional credit may be arranged with the instructor). Open to juniors and seniors. J. Windmuller. A study of the industrial relations systems of less-developed countries and internationalized non-Western countries, including Japan, the Soviet Union, Yugoslavia, India, and several others. Emphasis is on government labor policies, trade unions, and collective bargaining. Also included is a review of international organizations concerned with labor problems.

332 Labor in Developing Economies Spring. 3 credits. G. Fields. The economic problems of labor in less-developed nations. Among the subjects included are determinants of income and wage structures in less-developed countries; labor demand and unemployment; labor supply and migration; human resource policy; and development strategy and employment growth.

430 European Labor History Fall. 3 credits. J. Windmuller. The development of trade unions in Great Britain, France, and Germany between 1850 and 1950. Patterns of union organization, political party—trade union links, the growth of industrial relations systems, and the evolution of public policies toward labor are emphasized.

499 Directed Studies For description see the section on Collective Bargaining, Labor Law, and Labor History.

530 Comparative Industrial Relations Systems: Western Europe Fall. 3 credits. For graduate students. J. Windmuller. Students in this course attend the lectures in 1&LR 330 (see description for 1&LR 330). If enrollment warrants, they will also meet separately at a time to be arranged for discussion of topics in 1&LR 330 and related topics.

531 Comparative Industrial Relations Systems: Non-Western Countries Spring. 3 credits. For graduate students. J. Windmuller. Students in this course will attend the lectures in 1&LR 331 (see description for 1&LR 331). If enrollment warrants, they will also meet separately at a time to be arranged for discussion of topics in 1&LR 331 and related topics.

630 Seminar in International and Comparative Labor Problems Spring. 3 credits. J. Windmuller. This seminar will be concerned with international aspects of labor organizations and industrial relations. Specific topics will include an examination of international labor movements, the role of the International Labor Organization, the international-affairs interests of unions in the United States and other countries, and the labor relations policies of multinational corporations.

799 Directed Studies For description see the section on Collective Bargaining, Labor Law, and Labor History.


140 Development of Economic Institutions Spring. 3 credits. Prerequisite for non--LR students: permission of instructor. G. Boyer. Provides students with an understanding of the historical roots of the economic system currently dominant in Western Europe and the United States. The course will focus on (a) the process of European economic growth prior to 1814, (b) the effect of industrialization on labor in Great Britain, and (c) the historical evolution of economic thought from Adam Smith to J. M. Keynes.

240 Economics of Wages and Employment Fall, spring, or summer. 3 credits. Prerequisites: Economics 101--102 or equivalent.

This course analyzes the characteristics and problems of the labor market by applying to them the theory and elementary tools of economics. Behavior on both the demand and supply sides of the labor market is analyzed to gain a deeper understanding of the effects of various government programs targeted at
340 Economic Security Fall or spring. 3 credits. 
Staff.

History, philosophies, and the economic and social effects of social security measures. Analysis of programs offering protection against economic loss due to industrial accident, temporary and permanent disability, illness, old age, premature death, and unemployment, as well as private and voluntary efforts to provide security, and the problems of integrating public and private programs. An examination is made of proposals for amending or modifying economic security measures.

640 The Economics of Employee Benefits Spring. 3 credits. Open to juniors, seniors, and graduate students.
O. Mitchell.

An analysis and appraisal of private, public, and governmental benefits. The institutional and economic effects of various government programs targeted at demand (employer) and supply (employee) sides of the labor market. The specific content and emphasis varies in response to the interests of the faculty member teaching the course.

344 Comparative Economic Systems: Soviet Russia Fall. 4 credits. 
G. Clark.

A comparative analysis of the principles, structure, and performance of the economy of Soviet Russia. Special attention is devoted to industry and labor.

441 Income Distribution Fall. 3 credits. Open to upperclass and graduate students.
R. Hutchins.

Explores income distribution in the United States and the world. Topics to be covered include functional and size distributions of income, wage structure, income-generating functions and theories, discrimination, poverty, public policy and income distribution, international comparisons, and changing income distribution and growth.

495 Honors Program Fall and spring (yearlong course). 3 credits each term.
For description see the section on Collective Bargaining, Labor Law, and Labor History.

497–498 Internship Fall or spring. 3 and 6 credits.
For description see the section on Collective Bargaining, Labor Law, and Labor History.

499 Directed Studies For description see the section on Collective Bargaining, Labor Law, and Labor History.

540 Labor Economics Fall or summer. 3 credits. 
Prerequisites: Economics 101–102 or equivalent. Required of graduate students majoring or minoring in labor economics and M.I.L.R. candidates.
R. Smith.

This course analyzes the characteristics and problems of the labor market by applying to them the theory and elementary tools of economics. Behavior on both the demand (employer) and supply (employee) sides of the market is analyzed to gain a deeper understanding of the effects of various government programs targeted at the labor market. Topics covered include education and training, fringe benefits and the structure of compensation, labor-force participation and its relationship to household production, issues regarding occupational choice, an analysis of migration, labor-market discrimination, and the effects of unions.

541 Social Security and Protective Labor Legislation Spring. 3 credits. Normally required of graduate students majoring or minoring in labor economics and required of M.I.L.R. candidates.
Staff.

History, philosophies, and the economic and social effects of social security measures. Analysis of programs offering protection against economic loss due to industrial accident, temporary and permanent disability, illness, old age, premature death, and unemployment, as well as private and voluntary efforts to provide security, and the problems of integrating public and private programs. An examination is made of proposals for amending or modifying economic security measures.

R. Hutchins.

Emphasizes policy issues in analyzing the relationship between the labor market and cash-transfer programs such as social security, public assistance, and unemployment and wages in determining the level and distribution of cash transfers. Investigates the connection between cash transfers and labor supply. Topics include determinants of cash-transfer demand and supply, the negative income tax experiments, and program incentives for withdrawal from the labor force (for example, incentives for early retirement implicit in old-age insurance). A paper on a specific program is required.

644 The Economics of Occupational Safety and Health Spring. 3 credits.
R. Smith.

The course analyzes the problem of occupational injuries and illnesses in the United States. The first section concentrates on legal requirements, judicial interpretations, and legal implications of the Occupational Safety and Health Act, then shifts to such questions as the need for, and appropriate goals of, the act; the stringency of safety standards considered in a benefit-cost framework; the difficulties in enforcing the act; and estimates of the impact of the act.

645 Politics and Markets I Fall. 4 credits.
Prerequisite: Economics 311 or 313 or permission of instructor.
R. Frank.

Focuses on applied microeconomic policy issues as a vehicle for studying the strengths and weaknesses of the market system. Topics covered include externalities, public goods, monopoly, economic regulation, and health and safety regulation.

646 Economics of Discrimination Fall or spring. 3 credits.
O. Mitchell.

This course examines differences in labor market rewards by gender, race, age, and other worker characteristics from both a theoretical and an empirical perspective. Economic modeling and statistical methodology (including computer analysis) are stressed. The course is aimed at advanced undergraduates and graduate students with some background in microeconomics and data analysis.

647 Evaluation of Social Programs Fall. 4 credits.
R. Ehrenberg.

An introduction to the methodologies used by economists to evaluate the impacts of social-action programs and legislation. General evaluation methodology, cost-benefit analysis, and econometrics are discussed. Case studies are considered to illustrate the uses of these techniques, to acquaint the student with major current government programs and legislation, and to estimate these programs' economic impacts. Throughout, the primary analytic framework used by the instructor is microeconomics.

744 Seminar in Labor Economics Fall. 3 credits.
I&LR 744 and 745 constitute the Ph.D. level sequence in labor economics.
R. Ehrenberg.

Reading and discussion of selected topics in labor economics. Applications of economic theory and econometrics to the labor market and human resource areas.

745 Seminar in Labor Economics Spring.
R. Ehrenberg.

Reading and discussion of selected topics in labor economics in the fields of theory, institutions, and policy.

789 Internship For description see the section on Collective Bargaining, Labor Law, and Labor History.

799 Directed Studies For description see the section on Collective Bargaining, Labor Law, and Labor History.

940 Workshop in Labor Economics Fall or spring. 3 credits. Intended for Ph.D. students who have started to write their dissertations. Focus is on the formulation, design, and execution of dissertations. Preliminary plans and portions of completed work are presented for discussion.

Organizational Behavior

R. Stern, chairman; S. Bacharach, S. Barley.
L. Gruenfeld, T. Hammer, P. Tolbert, H. Trice, L. Williams

120 Introduction to Macro Organizational Behavior and Analysis Fall. 3 credits.
Staff.

The relationship between industry and the economy as a whole and its implications for other social institutions in American society (including stratification, politics, and American values) is discussed. The nature of industrial organizations and of complex organizations in general, emphasizing authority relations, goals, the division of labor, and bureaucracy.

121 Introduction to Micro Organizational Behavior and Analysis Spring or summer. 3 credits.
Staff.

Deals with the relationship between the individual and the organization and such basic psychological processes as need satisfaction, perception, attitude formation, and decision making. The individual is described and examined as a formal and informal group member. Within this area, particular emphasis is placed on leadership, problem solving, and conflict resolution.

222 Studies in Organizational Behavior: Regulating the Corporation Fall or summer.
R. Stern.

The course will examine public and private power from an organizational perspective. The resource-dependence approach to organization-environment relations provides a framework for interpreting government attempts at the regulation of corporate behavior. Topics cover the structure and functioning of government regulatory agencies and corporate responses to regulation, including corporate strategy, change, and political influence. The role of interest groups such as consumer or citizens organizations is also considered. Research and case materials focus on the implementation of environmental protection, occupational health and safety, equal opportunity, antitrust, and rate-setting regulations.

321 The Psychology of Industrial Engineering Fall. 4 credits.
T. Hammer.

A study of the human factors in the industrial engineering of work, workplaces, tools, and machinery.
The course examines the aspects of individual and social psychology that operate in the work setting and that should be taken into account in the design of jobs. These include limitations of the human sensory system, individual differences in skills, abilities, motives, and needs; group dynamics; intrinsic motivation, job satisfaction, conflict.

322 Comparative Theories of Organizational Behavior and Social Character Fall. 3 credits. L. Gruenfeld.

A comparative social-psychological approach is used to examine theories of work, authority, conflict, and change in employment organization.

323 Introduction to the Study of Attitudes Fall. 4 credits. Open to juniors and seniors. Staff.

Designed to acquaint the student with what is known about (1) origins of human attitudes, (2) the determinants of attitude change, and (3) the measurement of attitude differences. Studies employing clinical, experimental, and survey techniques are discussed. Each student designs, executes, and analyzes his or her own research study.

324 Work Organizations, Troubled Employees, and Employee Assistance Programs Spring. 3 credits. Limited to 40 students. Prerequisite: one or more courses in sociology and psychology and permission of instructor. H. Trice.

Focus is on the relationship between organizational life and psychiatric-criminal behaviors. Covers (1) the nature and etiology of psychiatric disorders such as alcoholism, other drug and substance abuse, and the major neuroses; (2) corporate and white-collar criminal behavior; (3) the role of occupational and organizational risk factors in etiology; (4) various types of criminal responses to troubled employees—mental hospitals, prisons, jails, halfway houses, shelter workshops, and self-help groups such as Alcoholics Anonymous. Puts differential emphasis on programs within work organizations that attempt to deal with troubled employees, job-based alcoholism, and employee assistance programs. Field format divides class into small groups for application in local relevant organizations. The development, strategies, and management of employee assistance programs will receive special attention.

325 Organizations and Social Inequality Spring. 4 credits.

Examines the central role that organizations in industrial societies play in allocating income, status, and other resources to individuals. Marxist conceptions of class and Weberian conceptions of job authority will be examined to see what additional power they add to the explanation of social inequality, particularly in regard to income attainment. As the central unit of analysis in the course will be organizations, a historical section will be included that deals with the evolution of current control and compensation structures in large-scale organizations.

326 Sociology of Occupations Fall or spring. 3 credits. Limited to 45 students. Prerequisite: one or more courses in sociology and permission of instructor. H. Trice.

Focuses on (1) the societal characteristics of occupations; division of labor, social stratification, mandate and license, occupational ideologies, stories, and tradition; (2) nature and expression of professionalization of occupations; (3) occupational characteristics of occupations: accommodation to formal organizations, occupational associations, and occupational norms; (4) social psychological characteristics of occupations: temperamental and intellectual role demands, occupational attraction, identity, and commitment, and occupational self-images; (5) relationships of occupational structure and organizational structure. Field format divides class into small groups for application among local occupational groups.

327 Psychology of Industrial Conflict Fall. 4 credits. Staff.

An application of frustration theory to the analysis of conflict and stress in organizations and society. Comparisons are made between industrial relations, race relations, international relations, and other settings. Readings include behavioral research findings from a variety of studies in industry. Relevant contributions from experimental, social, and clinical psychology are also considered.

328 Cooperation, Competition, and Conflict Resolution Fall or spring. 3 credits. Limited to 45 students. Prerequisite: one or more courses in social psychology and permission of instructor. H. Trice.

This course reviews the concept of culture as it has evolved in sociology and anthropology, applying it to formal organizations in workplaces such as corporations and unions. The course first examines the nature of ideologies as sense-making definitions of behavior concentrating on the cultural forms that carry these cultural messages, rituals, symbols, myths, sagas, legends, and organizational stories. Considerable attention will be given to rites and ceremonies as they evolve in organizational life that consolidate many of these expressive forms into one. The course will examine types of ceremonial behavior such as rites of passage, rites of enhancement, and rites of degradation, including the role of language-gestures, physical settings, and artifacts in ceremonial behavior. The presence of subcultures and countercultures in organizational behavior will also receive attention, through a case study of the part played by occupational subcultures in formal organizations. Emphasis will be placed on empirical examples from both the organizational behavior literature and the profession’s field research. Field format divides class into small groups for application in local relevant organizations.

370 The Study of Work Motivation Fall. 4 credits. Open to juniors and seniors with permission of instructor. Staff.

Designed to acquaint the student with the basic concepts and theories of human motivation, with implications for organizational change and job design. Focus is on theories of worker motivation and on research approaches and results as they apply to individuals and groups in formal organizations. Readings are predominantly from the field of organizational psychology, supplemented by relevant contributions from experimental, social, and clinical psychology. Each student designs, conducts, and analyzes a research study of his or her own.

371 Individual Differences and Organizational Behavior Fall or spring. 4 credits. Recommended: some acquaintance with the substance and methods of behavioral or social science. L. Gruenfeld.

This course examines personality types from both a sociological analysis of organizations. Traces organizational theory from Max Weber to the most recent research. Among the themes to be discussed are internal structure of organizations, communication in organizations, decision making, change, organizational technology, and organizational environment.

372 Sociological Models of Organizations Spring. 3 credits. Prerequisites: I&LR 120 and 121 or equivalent. P. Tolbert.

Introduces students to the basic issues involved in the sociological analysis of organizations. Traces organizational theory from Max Weber to the most recent research. Among the themes to be discussed are internal structure of organizations, communication in organizations, decision making, change, organizational technology, and organizational environment.

373 Organizational Behavior Simulations Fall. 3 credits. Prerequisite: I&LR 120 and 121 or equivalent. R. Stern.

Basic principles of organizational behavior are studied through readings and participation in three simulation games: (1) The Organizational Game: Design, Change, and Development, by Miles and Snow, simulates traditional organization, while the second, The Fuzzy Game, by Paton and Lockett, simulates a cooperative. A third game models executive decision making. Organizational design, decision making, and conflict are the central topics of discussion. The contrasting bases of power in the organizations permit an examination of the assumptions underlying organization structure and process.

374 Technology and the Worker Fall. 3 credits. S. Barley.

Examines theory and research pertaining to the social implications of technology and technological change for the work worlds of blue-collar, white-collar, and professional workers. At issue is the adaptation of technology as a social phenomenon, approaches to the study of technology in the workplace, the reactions of individuals and groups to technological change, the construction of a technology’s social meaning, and the management of technological change. A broad range of technologies will be considered, but particular emphasis will be given to automation, electronic data processing, and sophisticated microelectronic technologies, including CAD-CAM systems, telecommunication networks, medical imaging technologies, artificial intelligence, and personal computers.

420 Group Processes Fall. 4 credits. L. Gruenfeld.

Several conceptual and methodological approaches are applied to the obstable of group processes in open and ongoing groups. Emphasis is on the systematic observation of interpersonal behavior in open field groups rather than contrived experimental groups.

423 Evaluation of Social Action Programs Fall or spring. 3 credits. H. Trice.

A consideration of the principles and strategies involved in evaluation research, experimental research designs, process evaluation, and adaptations of cost benefits and cost efficiency to determine the extent to which intervention programs in fields such as training and therapy accomplish their goals. The adaptation of these strategies to large social contexts such as child guidance clinics, mental health clinics, and programs in the poverty areas, such as Head Start, is considered. Includes fieldwork and emphasizes assessment of program implementation.

424 Study of Public Sector Bureaucracy Spring. 3 credits. Prerequisite: permission of instructor. S. Bacharach.

Field research in public sector organization such as a school bureaucracy or a social welfare bureaucracy. Students conduct a major study into which they integrate themes from organizational theory. Theoretical issues as well as decentralization, participation, and communication are discussed in the seminar.
425 Sociology of Industrial Conflict  Spring 4 credits. R. Steinhauer. The focus is on the variety of theoretical and empirical evidence available concerning social, economic, and political causes of industrial conflict. The manifest and latent causes of conflict are reflected in labor turnover, absenteeism, and sabotage, and the influence of the environment in which they occur is emphasized.

426 Theories of Industrial Society  Fall 4 credits. Prerequisite: I&LR 120 and permission of instructor. S. Bacharach. Concentrates primarily on the works of Weber and Marx and will consist of readings in the original texts.

427 The Professions: Organization and Control  Fall 4 credits. P. Tolbert. Focus is on the sources of power and control exercised by professional groups in contemporary society. A number of issues will be examined in this context, including the role of professions in society, processes through which an occupational group becomes defined as a profession, sources of control that professional associations have over their members, relations between professionals and nonprofessionals in organizations, and the relationship between unionization and professional organization.

471 Organizational Analysis of Trade Unions  Fall. 3 credits. Prerequisite: I&LR 120 and 121 plus one additional course in organizational behavior. R. Stern, T. Hammer. The course is designed to use organizational theory and research in the examination of trade unions. Studying trade unions as organizations includes discussion of the role of unions in contemporary society and the meaning of unions to individual members. Unions will be the unit of analysis in considering unions as agents of social change, unions in interorganizational relationships, and union political activity. Union members will be the focus in considering why people join unions, commitment to unions, dual allegiance problems, and leadership. The course will also address the issues of how effective unions are as a mechanism of worker participation in management decision-making. Course material focuses on current research on unions and on strategies for further research.

472 Applied Organizational Behavior  Fall. 3 credits. Prerequisites: I&LR 120 and 121. S. Bacharach. Introduces students to intermediate theory of organizational behavior. It will specifically concentrate on teaching students to use organizational theories for analytical and applied purposes. Among the issues to be addressed are organizational structure, work processes, organizational politics, organizational design, job design, incentive systems, and quality-of-work-life programs.

475 Organizational and Political Behavior in School Districts  Fall. 4 credits. Enrollment limited. Prerequisite: permission of instructor. T. S. Bacharach. This course is intended to provide students with research experience through the study of the administrative and governance processes in school districts. The students will be required to work with school district and union personnel while investigating the following areas: (a) structure and process of decision making in urban and rural school districts, (b) organizational conflict as reflected in school board meetings, (c) the variations in, and effect of, leadership style, as evidenced by different superintendents' advisory techniques, (d) the collective bargaining process as reflected in labor contracts and actual negotiations, (e) the effect of the Taylor Law on the structure and process of decision making in school districts, and (f) the effects of administrative law on conflict in school districts. Students will be responsible for the collection of data and the presentation of a final report of their project.

476 Unions and Public Policy in School Districts  Spring. 4 credits. Enrollment limited. Prerequisite: permission of instructor. S. Bacharach. A continuation of I&LR 475, but 475 is not a prerequisite. This course is strictly a research seminar. Students will be expected to work with school districts and union personnel while investigating the following areas: (a) labor contracts with school districts, (b) relations between teachers' unions, school boards, and superintendents, (c) teachers' unions' involvement with school district policies.

478 Applied Topics in Organizational Behavior  Fall. 4 credits. Prerequisite: two courses in organizational behavior beyond the 100 level. L. Williams. Reading and classroom discussion will be devoted to each of three topics. The topics are industrial gerontology, with a particular focus on retirement, technology and the office; and gender and personality as organizational variables. Readings will be primarily from journal articles. Students will have a research task for each topic.

495 Honors Program  Fall and spring (yearlong course). 3 credits each term. For description see the section on Collective Bargaining, Labor Law, and Labor History.

497–498 Internship  Fall or spring. 3 and 6 credits. For description see the section on Collective Bargaining, Labor Law, and Labor History.

499 Directed Studies  For description see the section on Collective Bargaining, Labor Law, and Labor History.

520 Micro Organizational Behavior and Analysis  Fall or summer. 3 credits. Staff. Survey of concepts, theories, and research from the fields of organizational and social psychology as these relate to the behavior of crisis teams and groups in organizations. Job attitudes, motivation, performance, leadership and power, group formation, perception, and organizational climate. A preliminary course for advanced work in organizational behavior.

521 Macro Organizational Behavior and Analysis  Spring. 3 credits. Staff. Formal organizations are studied from the perspectives of classical organization theory, human relations theory, and comparative and cross-cultural analysis. Contemporary theories and quantitative approaches to organizational structure are also considered in some detail. Intended to be preliminary to more intensive work in organizational behavior.

620 Theories of Organizational Change, Innovation, and Evaluation  Spring. 4 credits. Prerequisite: two organizational behavior courses at the 300 level or advanced courses in sociology or psychology. H. Tice. This seminar examines the dynamics of individual, structural, and environmental factors operating in organizational change in general, and in the implementation and use of innovations within formal organizations in particular. The role of evaluative research in assessing the effectiveness of the implementation of innovations and in determining organizational effectiveness are analyzed. Several case studies of organizational change in government, unions, and private industry are examined. The emphasis is on conceptual frameworks for analyzing organizational change and mounting evaluative research on innovations. Readings are interdisciplinary and include sociology, psychology, and political science.

621 Organizational Diagnosis and Development  Spring. 4 credits. Prerequisites: undergraduate, I&LR 520 and 521; graduate students, I&LR 520 and 521 or equivalent; and permission of instructor. L. Gruenfeld. This applied course considers theories and techniques for the identification and improvement of organizational problems at the behavioral (micro) level. Methods for the implementing of change are evaluated in the light of several alternative and descriptive theories of individual and group development and effectiveness. The course emphasizes both qualitative and quantitative data processing procedures.

622 Organizations and Environments  Spring. 3 credits. P. Tolbert. This course will survey the literature on organization-environment relationships and work on organizational dependence and power, management of uncertainty, and other aspects of interorganizational cooperation and conflict. The objective of the course is to provide students with a general theoretical understanding of the way in which organizations can shape their environment and in which the environment constrains and shapes organizations.

624 Groups in Work Organizations  Fall. 4 credits. Enrollment limited. Prerequisite: Senior standing, and I&LR 371 or I&LR 629 or equivalent, or permission of instructor. L. Gruenfeld. This is an applied social psychology course that emphasizes the building, maintenance, and renewal of purposive groups working in formal organizations. The course deals with models and variables that interact with group cohesion and performance. Structural, environmental, task, motivational, and interpersonal variables are considered. This course work includes observation and analysis of decision making and negotiating behavior in a group.

625 Labor and Monopoly Capital: The Growth of Large United States Firms in the Past Century  Spring, 7 weeks only. 2 credits. Staff. A critical review of two recent books with very different explanations for the rise of large, hierarchically differentiated corporations in the United States: Harry Braverman, Labor and Monopoly Capital, and Alfred D. Chandler, The Visible Hand. These books are supplemented by articles on patterns of industrial union and internal structural transformation of large firms in the United States economy.

627 Leadership in Organizations  Spring. 3 credits. Prerequisites: two organizational behavior courses at the 300 level or advanced courses in sociology or psychology. L. Gruenfeld. An examination of theories and research findings from the behavioral sciences that are relevant to leadership and the influence process in groups and organizations. Personality, situational factors, intergroup processes, interpersonal perception, as well as motivation to lead and to follow will be discussed. The implications for leadership training, organization development, and action research are explored.

628 Cross-Cultural Studies of Organizational Behavior  Fall or spring. 3 credits. Designed for graduate students interested in research and sociopsychological theory at the workplace. Undergraduates with permission of instructor. L. Gruenfeld. How organizational behavior is affected by age (generational), sex, social class, and cultural variables. Both theoretical and research-related issues pertaining to these variables are explored to illustrate the social, psychological, and cultural explanations for age differences in job satisfaction and performance. What can be inferred from studies that ignore age (sex, social class, and cultural) differences? What are the causes and patterns, both subjective and objective, for age and other kinds of discrimination?
678 Seminar in Field Research II

explored, including problems of gaining and sustaining
theories and concepts, and the possibility of actual field participation in an ongoing research project is explored.

720 Issues of Measurement in Research on Organizations

T. Hammer

Concerns the study of tests and measures used to assess central variables in organizational behavior and related fields. Students will learn where to find measures suitable for their research purposes and will examine the theories that define the constructs being measured; the empirical information available about different measures; construction, reliability, and validity; and the ways in which the instruments have been used in research and practice.

722 Theories of Organizational Behavior

A proseminar of current topics in organizational psychology. Discussions based on current research and theoretical innovations in the field.

723 Behavioral Research Theory, Strategy, and Methods I

Course: 4 credits. Designed to meet the needs of M.S. and Ph.D. candidates majoring in organizational behavior, but other graduate students may enroll.

Materials studied in I&LR 723 and 724 include (1) theoretical, conceptual, and ethical questions; (2) survey research and attitude-scaling procedures; (3) laboratory research methods; (4) participant observation and interview methods; (5) use of documents and qualitative data analysis. Provides students with important philosophical background for doing research and exposes them to a well-balanced, interdisciplinary set of quantitative and qualitative research tools.

724 Behavioral Research Theory, Strategy, and Methods II

Spring. 3 credits. Must be taken in sequence with I&LR 723, except by petition. Designed to meet the needs of M.S. and Ph.D. candidates majoring in organizational behavior, but other graduate students may enroll.

Students will review a series of published research papers in the field of organizational behavior and method as well as theory.

725 Analysis of Published Research in Organizational Behavior

Fall. 3 credits. Prerequisites: I&LR 520–521 and one year of statistics.

R. Stern

An advanced research methods course that critically examines published research papers in the field of organizational behavior in terms of research design and method as well as theory.

726 Organizational Behavior III

Fall. 3 credits. Prerequisites: I&LR 520 and 521 and permission of instructor.

S. Barley

An advanced proseminar that seeks to develop an interdisciplinary perspective on selected topics in organizational behavior. The topics themselves will change from year to year depending on participants’ interests. Course is designed to allow students and the instructor to jointly pursue significant scholarly inquiry into one or more arenas of organizational theory.

Emphasis will be placed on exploring the relevance of tradition in related disciplines (anthropology, linguistics, philosophy, sociology, etc.) that may enrich our understanding of organizational life.

727 Work and Industrial Conflict

Spring, weeks 7–14. 2 credits.

R. Stern

A concentrated examination of the sociology of industrial conflict. The seminar focuses on published research papers in the field of industrial conflict from a sociological perspective. Examples of topics covered include: (1) theories of conflict, their development and applications; (2) the role of conflict in the economic, political, and social functions of society; (3) the impact of conflict on the work process and the workplace; (4) the role of individuals and groups in the management of conflict; (5) the role of collective bargaining in the resolution of conflict; (6) the role of organizations in the resolution of conflict; and (7) the role of government in the resolution of conflict.

728 Seminar on Work Motivation

Spring. 2 or 4 credits. Prerequisite: I&LR 520–521.

T. Hammer

Two independent but sequence-connected minicourses.

(1) Theories of Work Motivation. 7 weeks. 2 credits.

Course will provide an introduction to basic concepts of human motivation in general, with particular emphasis on the theories that explain and predict work motivation. Students will examine the empirical research that tests the validity of the theories and shows how and under what conditions different motivation models can be used in practice in work organizations.

(2) Job Design. 7 weeks. 2 credits. In the seminar, students will examine job design and work tasks and explore the role of the job design and work tasks in the development of theories of work motivation. Students will examine the empirical research that tests the validity of the theories and shows how and under what conditions different motivation models can be used in practice in work organizations.

729 Organizational Change and Intervention

Fall. 3 credits. Graduate students only; no exceptions.

L. Williams

This seminar is concerned with planned and unplanned change in organizations. It is designed to analyze theory in practice. Particular attention will be paid to the role of internal and external change agents. Several applied research programs such as the Center for Creative Leadership, Tavistock, and SRC will also be examined.

798 Internship

For description see the section on Collective Bargaining, Labor Law, and Labor History.

799 Directed Studies

For description see the section on Collective Bargaining, Labor Law, and Labor History.

920 Organizational Behavior Workshop

Fall. 2 credits. Limited to M.S. and Ph.D. candidates in the department. S-U grades only.

R. Stern

This workshop is designed to provide a forum for the presentation of current research undertaken by faculty members and graduate students in the Department of Organizational Behavior and by invited guests. All M.S. and Ph.D. candidates in the department who are at work on their theses are strongly urged to enroll. Each student in the course will be expected to make at least one presentation during the year, focusing on the formulation, design, execution, and results of that student’s thesis research.

Personnel and Human Resource Studies

260 Personnel Management  
Fall or spring. 3 credits. Open only to ILR students. Non-ILR students may take ILR 151.
Staff.
An introductory overview of the management of human resources from an institutional perspective. Topics include human resource decisions dealing with staffing, employee development, work-system rewards, and employee relations. Emphasis is on (a) problem-solving and decision-making approaches; (b) operational methods, technologies, and practices; (c) application of relevant behavioral science theory and research; and (d) legislation and other environmental constraints having an important bearing on the effective utilization of human resources by an enterprise.

360 Human Resource Economics and Public Policy  
Fall or spring. 3 credits. Open to sophomores, juniors, and seniors. V. Briggs, J. Bishop.
A review of contemporary labor-market trends and theories pertaining to public efforts to develop the employment potential of the nation’s human resources. Changes in the “oiler” programs in apprenticeship, vocational education, and vocational rehabilitation, as well as the “new” training programs, are studied. Special problems pertaining to youth, rural workers, welfare reform, job creation, worker relocation, economic development, targeted tax credits, industrial policy, and “enterprise zone” proposals will be examined. Comparisons are made with European initiatives.

361 Effective Supervision  
Fall or summer. 3 credits. Limited to juniors and seniors. Prerequisite: ILR 260 or equivalent. W. Wasmuth.
This course covers twenty-five major topics that make a critical difference in the life of a newly appointed or experienced supervisor. Theoretical and real-life case examples are provided from office, factory, union, nonunion, large, and small organizations and cover technical, psychological, social, and political issues at the supervisory level.

365 New York State Human Resource and Employee Relations Issues and Policies  
Fall or spring. 3 credits. Open to ILR students participating in an Albany internship. J. Slocum.
This seminar will consider functions, current issues, and policy development in New York State human resource development and employee relations. The role of the state in protective labor law administration; human resource programs; its function as a neutral party in labor disputes in the public and private sector; and legislation affecting employee-employer relations and economic development will be reviewed. Students will be assigned individual research topics that will be discussed in the seminar and developed into a term paper.

366 Women at Work  
Fall or spring. Variable 3 or 4 credits. Prerequisite: ILR 260 or equivalent. F. Miller.
Various aspects of female occupational roles in twentieth-century United States. Historical, social, and legal factors that influence women’s choice of careers, work socialization and training, and subsequent labor-market experience are considered. Working women’s entry-level jobs, opportunities for advancement, and income are compared to men’s.

Fall or spring. 3 credits. Open to ILR students participating in Washington, D.C., internship. S. Levitan.
The seminar will examine labor-market developments and their measurement, with emphasis on current social strategies to ameliorate social problems. The systematic relationships between the elements of various programs and their purposes, the institutional structures designed to carry them out, and the clients they were designed to serve will be explored. Topics stressed will relate to current national issues and priorities. Students will engage in individual projects on topics approved by the instructor.

469 Immigration and the American Labor Force  
Spring 3 credits. V. Briggs.
The role that immigration continues to play as a source of human resource development in the United States. The primary focus is on developments since the Immigration Act of 1965 and the Refugee Act of 1980. In addition to legal immigration, border commuters, the topics of illegal immigration, refugees, asylees, and nonimmigrant workers are also examined. Comparisons are made with immigration systems of other nations. Public policy aspects are explored in depth.

495 Honors Program  
Fall and spring (yearlong course). 3 credits each term.
For description see the section on Collective Bargaining, Labor Law, and Labor History.

497–498 Internship  
Fall or spring. 3 and 6 credits.
For description see the section on Collective Bargaining, Labor Law, and Labor History.

499 Directed Studies  
For description see the section on Collective Bargaining, Labor Law, and Labor History.

560 Personnel Management  
Fall or spring. 3 credits. Grads only.
Staff.
A survey course covering the major areas of the management of human behavior in work organizations. Consideration is given to such aspects of personnel work as job analysis, motivation, human resource planning, recruitment and selection, training, management development, organization development, compensation, and employee and labor relations. Emphasis is on the application of theory and research to the solution of personnel problems.

563 Personnel and Human Resource Management: Policy and Practices  
Fall. 3 credits. Limited to 30 students, seniors and graduate students only. Prerequisites: ILR 260/560, electives in personnel and human resource management, and permission of instructor. R. Risley.
This seminar will be concerned with issues of current importance to leading practitioners and explore the policies and practices developed to meet organizational goals. Changing concepts of the P/HR function within organizations and new policy and programs to meet changing needs will receive special attention. Outstanding leaders from the practitioner area will serve as guest seminar leaders during the term. Students will be required to do background reading for each topic as well as read the advanced material prepared by the guest leader. Students should be prepared to be active participants in the seminar discussions.

659 Internal Staffing: Managing Careers in Organizations  
Spring or summer. 3 credits. Limited to 30 students. Prerequisite: ILR 260 or 560 and 210/211 (510/511) or equivalent, and permission of instructor. B. Gerhart, S. Rynes.
Analysis of the movements of people within organizations and the management of career development processes. Selected topics include job search and choice processes, career planning methods and techniques, career and life stages, mentorships, lifetime employment systems, middle career changes, career and family integration, criteria for internal promotions, and the role of performance evaluation and assessment centers in placement decisions.

660 Seminar in Personnel or Human Resource Management  
Fall and spring. 3 credits. J. Bishop.
A "floating" seminar designed to give faculty and students an opportunity to pursue specific topics in detail, with an emphasis on theory and research. Topics vary from semester to semester. Interested students should consult current course announcements for details.

661 Applied Personnel and Organizational Development Practice  
Spring. 3 credits. Prerequisite: undergraduates, ILR 260; graduate students, ILR 560 or equivalent. J. Slocum.
Deals with personnel development technique and organizational development intervention methodology. Students examine and practice group methods, feedback and processing technique, active listening, one-to-one counseling, behavior modeling, role playing, the case method, team building, survey-guided intervention, and other relevant methods, techniques, and issues. This course combines pertinent literature with the opportunity for hands-on practice in a workshop setting. Students have responsibility for developing and delivering scholarly papers that explore a specific method, technique, or critical issue. In addition, a final project requires a comprehensive proposal that describes an organizational development intervention.

662 Managing an Organization through Simulation Training  
Spring or summer. 3 credits. Limited to a total of 40 ILR and hotel administration students, seniors and graduate students only. Prerequisite: ILR 260 or 560 or equivalent, and permission of instructor. W. Wasmuth.
Techniques of simulation are applied to a hotel banquet facility to enable students working in a small group (task force) to accomplish the following objectives: (1) plan and develop strategies to solve a variety of realistic problems in a supportive low-risk simulated setting; (2) provide direct feedback to the participants and the effects of their decisions on ten organizational performance indicators, including morale, turnover, productivity, customer satisfaction, and profit/loss; (3) understand the interrelationships of the indicators and of various parts of an organization through an open systems approach; (4) develop an awareness of how group interaction affects the quality and timeliness of team decision making; (5) demonstrate communication skills in organizing and reporting significant results of team accomplishments. Also, each student will prepare an individual research project that focuses on some aspect of the simulation experience.

663 Job Matching: Job Search and Organizational Recruiting  
Spring. 3 credits. Limited to 35 students. Prerequisites: undergraduates, ILR 260 and 210/211; graduate students, ILR 560 and 510/511. B. Gerhart, S. Rynes.
Research-oriented treatment of employment hiring practices from both the job-seeker and organizational perspectives. Topics include individual job search and choice, organizational recruiting strategies and practices, and methods used to predict on-the-job success (e.g., tests, interviews).

664 Seminar in Organizational Communication  
Spring. 3 credits. Permission of instructor. W. Frank.
Seminar centers on selected issues and relevant research involved in the study of communication with formal organizations. Organizational structure and design, patterns of information flow, and individual and group determinants of communication effectiveness will be important concerns.

665 Case Studies in Personnel Administration  
Spring. 3 credits. Enrollment limited. Prerequisite: ILR 260 or 560 plus two other courses in personnel and human resource studies and permission of instructor. Staff.
This course is designed to introduce students to personnel information systems and to provide hands-on experience in using two such systems, one on a mainframe and the other on a micro computer. The first week introduces an introduction to basic concepts. The remaining weeks are taken up with exercises whose solutions involve data accessing, manipulation, and analysis. The purpose is to help students develop the computer analytical skills necessary to function effectively in modern personnel departments.

691 Human Resource Planning Spring, 4 credits. Limited to 35 students. Prerequisites: I&LR 560 or equivalent, two courses in statistics, and permission of instructor.
L. Dyer, C. Milkovich.
The process of human resource personnel planning as practiced by public and private employers. Included are topics such as forecasting human resource needs, programming, techniques to meet forecasted needs, and methods of controlling an organization’s supply of human resources. The seminar is organized around a computer simulation game in which students make policy and program decisions for a fictional organization. Decisions are evaluated on the basis of their contributions to the organization’s human resource and profit objectives.

693 Design and Administration of Training Programs Spring, 3 credits. Prerequisite: I&LR 560 or equivalent and permission of instructor.
W. Frank.
An analysis and exploration of the training and retraining function as applied in business, government, and industrial organizations. Consideration is given to learning theory as well as the conceptual framework and practical approaches with which learning activities are developed at the workplace at all levels.

694 Personal Computer Applications In Human Resource Management and Labor Relations Spring, 3 credits. Limited to 18 students. Prerequisites: I&LR 260 or 560 or equivalent; at least one upper-level PHR elective; basic statistics; and permission of instructor.
J. Boudreau, B. Gerhart.
Personal computers are gaining increasing use in organization decision making. This is true in human resource management and labor relations as well as in other areas. This course is designed to present students with current personal computer software packages and to show how they can be used to improve human resource decision making. The course involves hands-on personal computer cases designed to present modern human resource situations that can be analyzed using PC applications. In addition, students will have opportunities to design their own applications and present them to the class.

696 Personnel Administration and Government Regulations Fall, 3 credits. Prerequisite: I&LR 260 or equivalent.
R. Risley.
A survey and analysis of government regulations affecting personnel management in nongovernment organizations, examining the framework within which human resource decisions must be made. Government agencies’ methods of enforcement of such regulations and the firms’ responsibilities for failure to comply with these legal requirements are considered. This course will be on policy development and administration to meet legal requirements. Topics include FMLA, OSHA, EEOC, Employee Rights, Employment at Will, EAP, and Title VII.

760 HRM Seminar: Compensation Theory/Research Fall or spring, 3 credits. Prerequisites: I&LR 560, 510/511, and 669 and permission of instructor.
J. Boudreau.
Reviews theories and research on reward and compensation from economics, psychology, and sociology. The focus will be at the employer-employee level. Each theory or model will be examined to identify content and implications as well as to compare points of contradiction and/or consistency. Research related to executive compensation, strategic compensation issues, game theory, and comparable worth will also be examined.

A review of contemporary labor-market trends and theories as they relate to public policy efforts to develop the employment potential of the nation’s human resources. Changes in the “older” programs of apprenticeship, vocational education, and vocational rehabilitation as well as the “new” programs are studied. Special policy issues pertaining to youth, rural workers, welfare reform, job creation, industrial policy, wage subsidies, and worker relocation will be examined. The role of research to policy formulation and methods of evaluation of social programs will be reviewed. Comparison will also be made with related European initiatives.

798 Internship Fall or spring, 4 credits. Limited to 24 students. Prerequisite: I&LR 260 or equivalent.
J. Boudreau.
Individual research projects, with special emphasis on the responsibilities of the individual, are assigned to each student enrolled in the internship. These projects are conducted on the job and are reported in writing. Each student is required to write a critical analysis of his or her experiences and to present a seminar paper to the class. Research opportunities will be selected from the recommendations of the faculty. The internship is designed to acquaint students with research methods and to provide practical experience in the field.

Interdepartmental Courses

150 Labor Problems in American Society Fall or spring, 3 credits. J. Boudreau.
A survey for students in other divisions of the University. An analysis of the major problems in industrial and labor relations; labor union history, organization, and operation; labor-market analysis and employment practices; industrial and labor legislation and social security; personnel management and human relations in industry; collective bargaining and the settlement of industrial disputes; and the rights and responsibilities of employers and employees.

151 Personnel Management for Managers Fall or spring, 3 credits. Not open to I&LR students.
G. Milkovich.
A study of the personnel function in work organizations, with special emphasis on the responsibilities of managers and supervisors. After reviewing evidence from behavioral science research on factors affecting work behavior, such major personnel areas as recruitment, selection, and placement; training; compensation and benefits; and discipline are considered.

451 Science, Technology, and the American Economy Fall or spring, 4 credits. Common Learning Course.
V. Briggs.
Examines the influences of the growth of science and the spread of technology on the development of the
American economy. Although attention will be given to evolutionary influences, the primary focus will be upon the post-World War II experiences as a result of the introduction of automation, robotics, and computer technology. The vantage point will be the linkage of these developments with employment, unemployment, income, and productivity considerations. Public policy issues such as research and development policy; the role of national defense priorities; the development of the biotechnology industry; the agricultural revolution, savings and investment rates; retaining and education needs, etc., will be examined. The related experiences of other industrial nations will also be discussed.

ILR Extension

Metropolitan

The following courses are open only to participants in the Extension Division in New York City. These courses are not open to undergraduate or graduate students matriculated in the Ithaca ILR programs. ILR Credit and Certificate Program courses at the Labor College are offered for four credits. Course and course credits earned in Extension Division certificate programs are not automatically accepted as transfer credits or as a basis of admission to the resident ILR undergraduate and graduate programs in Ithaca. Student applications for course transfer are evaluated by the ILR school on an individual basis.

301 Labor Union Administration Fall or spring. 3 credits.
A review of the operations of American unions, including a general theoretical framework but with major emphasis on practical operating experience. The course will consider the formal government of unions, organizational structure, objectives and how these are achieved; underlying structure and relationship among members, locals, and national organizations; the performance of the primary function of organizing, negotiating, contract administration, and the effect of the Landrum-Griffin Act.

326 Sociology of Occupations Fall or spring. 3 credits.
Focuses on (1) the changing character of American occupations within the context of social change; (2) occupational status—differences in income, prestige, and power and the resultant general phenomenon of social stratification; (3) vertical and horizontal occupational mobility; (4) recruitment and socialization into occupational roles; (5) the process of professionalization; and (6) comparison of personnel occupations with the career and organizational patterns of other occupations. A major sociological theme is the relationship between occupational structure and workplace structure.

346 Economics of Collective Bargaining Fall or spring. 3 credits.
Economic aspects of the negotiation, terms, and effects of union-management agreements at the individual firm, industry regional, and national levels. Topics examined include forces influencing contract demands and terms, employer adaptation to higher wages and benefits, interindustry differences in competitiveness, firm size, and markets; regional location of industry, international competition; government regulations; labor supply; inflation, recession, and unemployment.

350 History of Industrial Relations in the United States Fall or spring. 3 credits.
This review of the history of industrial relations in the United States emphasizes developments in the twentieth century. The course concentrates on the American worker, both union and nonunion; labor movements; and the environmental forces that have shaped industrial relations in the United States. Readings are selected from scholarly accounts and original sources.

351 Collective Bargaining Fall or spring. 3 credits.
A comprehensive study of collective bargaining; the negotiation and scope of contracts; the day-to-day administration of contracts; the major substantive issues in bargaining, including their implication for public policy; and the problem of dealing with industrial conflict.

352 Labor Relations Law and Legislation Fall or spring. 3 credits.
A survey of the law governing labor relations. The legal framework in which the collective bargaining relationship is established and bargaining takes place is analyzed. Problems of the administration and enforcement of collective agreements are considered, as are problems of protecting individual employee rights in the collective labor relations context. Also surveyed is traditional labor law; the legal system and method and to legal and constitutional problems of governmental regulation of industrial and labor relations.

353 Statistics (Statistical Reasoning) Fall or spring. 3 credits.
An introduction to the basic concepts of statistics: description of frequency distribution (averages, dispersion, and simple correlation) and introduction to statistical inference. Prerequisite to certain specialized courses on applications of statistics offered in various departments.

354 Economics of Wages and Employment Fall or spring. 3 credits. Prerequisites: Economics 101-102 or equivalent.
An introduction to the characteristics of the labor market and to analysis of wage and employment problems. Among topics studied are the composition of the labor force, job-seeking and employment practices, methods of objective determinations, theories of wages, employment, economic effects of unions, the nature and causes of unemployment, and programs to combat joblessness and poverty.

355 Society, Industry, and the Individual I Fall. 3 credits.
The relationship between industry and the economy as a whole and its implications for other social institutions in American society (including stratification, politics, and American values) is discussed. The nature of industrial organizations and that of complex organizations in general, emphasizing authority relations, goals, the division of labor, and bureaucracy.

356 Society, Industry, and the Individual II Spring. 3 credits.
Deals with the relationship between the individual and the organization and such basic psychological processes as need satisfaction, perception, attitude formation, and decision making. The individual is discussed as related to the labor market and the informal group member. Within this area, particular emphasis is placed on leadership, problem solving, and conflict resolution.

420 Group Processes Fall or spring. 3 credits.
An advanced undergraduate and beginning graduate course emphasizing group development. Readings and discussions include interpersonal attraction, conformity, interaction process, leadership, group effectiveness, norms, etc. Laboratory experiences in group tasks are provided.
Development of dispute resolution methods in American labor relations; issues and practices in neutral, binding arbitration of grievances and mediation; conciliation, fact-finding procedures will be discussed. We will also look at exclusive labor-management mechanisms to settle industry disputes.

257 Personnel Administration Fall or spring. 3 credits. Designed to provide an overview of personnel practices in the modern organization. It will focus on manpower planning, employment, training and development, motivation and compensation, and performance appraisal and communication for students who are currently supervisors or personnel practitioners or for those aspiring to those positions.

258 Organizational Behavior Fall or spring. 3 credits. Focus is on the principles and practices of effective union administration. Students will study the dynamics of democratic organizations and the role of leadership in organizational development. The course explores alternative methods of decision making and lines of responsibility. The legal obligations of unions and union officials will be discussed and analyzed. The course will also examine the procedures and execution of relationships inside the labor movement.

261 Introduction to Audio-Video Production for Trade Unionists Fall or spring. 2 credits. Acquaints students with the powerful role that radio and other media play in carrying labor's message to the public. Students will learn basic writing, interviewing, and technical skills needed for the production of radio programs.

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Keeran, Roger R., Ph.D., U. of Wisconsin. Assoc. Prof., Extension
Korman, A. Gerd, Ph.D., U. of Wisconsin. Prof., Collective Bargaining, Labor Law, and Labor History
Lipsky, David B., Ph.D., Massachusetts Inst. of Technology. Prof., Collective Bargaining, Labor Law, and Labor History
McCarthy, Philip J., Ph.D., Princeton U. Prof., Economic and Social Statistics
Milkovich, George, Ph.D., U. of Minnesota. Prof., Personnel and Human Resource Studies
Miller, Frank B., Ph.D., Cornell U. Prof. Emeritus, Personnel and Human Resource Studies
Mitchell, Olivia S., Ph.D., U. of Wisconsin. Assoc. Prof., Labor Economics
Risley, Robert F., Ph.D., Cornell U. Prof., Personnel and Human Resource Studies/Extension
Ross, Philip, Ph.D., Brown U. Prof., Collective Bargaining, Labor Law, and Labor History
Salvatore, Nicholas, Ph.D., U. of California at Berkeley. Assoc. Prof., Collective Bargaining, Labor Law, and Labor History
Seeber, Ronald L., Ph.D., U. of Illinois. Asst. Prof., Extension
Smith, Robert S., Ph.D., Stanford U. Prof., Labor Economics
Stern, Robert N., Ph.D., Vanderbilt U. Assoc. Prof., Organizational Behavior
Tolbert, Pamela S., Ph.D., U. of California. Asst. Prof., Organizational Behavior
Trice, Harrison M., Ph.D., U. of Wisconsin. Prof., Organizational Behavior
Velleman, Paul F., Ph.D., Princeton U. Assoc. Prof., Economic and Social Statistics
Williams, Lawrence K., Ph.D., U. of Michigan. Prof., Organizational Behavior
Windmuller, John P., Ph.D., Cornell U. Prof., Collective Bargaining, Labor Law, and Labor History/International and Comparative Labor Relations
Law School

Administration

Peter W. Martin, dean of the law faculty and professor of law
Jane L. Hammond, law librarian and professor of law
Charles W. Wollfram, associate dean for academic affairs and Charles Frank Reavis Sr. Professor of Law
Anne Lukingbeal, associate dean for admissions and student affairs
Albert C. Nemeth, associate dean and director of alumni affairs and placement
John Lee Smith, dean of students
Frances M. Bullis, assistant dean for development and public affairs

Law School

The primary function of the Law School is to prepare attorneys for both public and private practice who are equipped to render skillful professional service and who are thoroughly conscious of the important role played by the law as a means of social control. The curriculum is designed to prepare students for admission to the bar in all American states and territories.

Ordinarily, a student who is admitted to the Law School must have a baccalaureate degree from an approved college or university. The course of study leading to the degree of Doctor of Law (J.D.) covers three academic years. A number of students will be admitted to a program of study leading to the degree of Doctor of Law "with specialization in international legal affairs." There are combined graduate degree programs with the Johnson Graduate School of Management, the College of Arts and Sciences, the Department of City and Regional Planning, the School of Industrial and Labor Relations, and the graduate divisions in economics, history, and philosophy, as well as a special opportunity for highly qualified undergraduates in the College of Arts and Sciences to register in the Law School during their senior year.

The graduate program of the Cornell Law School is a small one, to which only a few students are admitted each year. The LL.M. degree (Master of Laws, Legum Magister) and the J.S.D. degree (Doctor of the Science of Law, Jurisprudentiae Scientiae Doctor) are conferred. A small number of law graduates may also be admitted as special students, to pursue advanced legal studies without being degree candidates.

For further information, refer to the Announcement of the Law School, obtainable from the Director of Admissions, Myron Taylor Hall.

Upperclass Courses

500 Civil Procedure
502 Constitutional Law
504 Contracts
506 Criminal Justice
508 Practice Training I
509 Practice Training II
512 Property
514 Reason, and Law and Process
515 Torts
600 Accounting for Lawyers
602 Administrative Law
605 Advanced Civil Procedure
607 American Indian Law
608 Antitrust Law
616 Commercial Law
617 Commercial Paper and Banking Transactions
618 Comparative Law
620 Conflict of Laws
622 Corporations
623 Corporations and Partnerships
624 Criminal Procedure
626 Debtor-Creditor Law
628 The Early Development of Anglo-American Common Law
630 Economics for the Lawyer
632 Energy, Natural Resources, and Telecommunications Law
636 Environmental Law
637 Equitable Remedies
638 Estate Planning
639 European Economic Community
640 Evidence
641 Fact Investigation and Discovery
642 Family Law
644 Federal Courts
646 Federal Income Taxation
647 Freedom of Expression
650 International Law
656 Interviewing and Counseling
658 Labor Law
660 Land-Use Planning
662 Law and Corporate Finance
664 Law Practice Dynamics
666 Law, Society, and Morality
668 Negotiations for Lawyers
670 Lawyers and Clients
677 Products Liability
680 Real Estate Transfer and Finance
682 Securities Regulation
684 Soviet Law
688 Taxation of Corporations and Shareholders

508 Telecommunications Law
511 Labor Law and Practice
512 Property
514 Reason, and Law and Process
515 Torts
520 Conflict of Laws
522 Corporations
524 Criminal Procedure
526 Debtor-Creditor Law
528 The Early Development of Anglo-American Common Law
530 Economics for the Lawyer
532 Energy, Natural Resources, and Telecommunications Law
536 Environmental Law
537 Equitable Remedies
538 Estate Planning
539 European Economic Community
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541 Fact Investigation and Discovery
542 Family Law
544 Federal Courts
546 Federal Income Taxation
547 Freedom of Expression
550 International Law
556 Interviewing and Counseling
558 Labor Law
560 Land-Use Planning
562 Law and Corporate Finance
564 Law Practice Dynamics
566 Law, Society, and Morality
568 Negotiations for Lawyers
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577 Products Liability
580 Real Estate Transfer and Finance
582 Securities Regulation
584 Soviet Law
588 Taxation of Corporations and Shareholders

600 Accounting for Lawyers
602 Administrative Law
605 Advanced Civil Procedure
607 American Indian Law
608 Antitrust Law
616 Commercial Law
617 Commercial Paper and Banking Transactions
618 Comparative Law
620 Conflict of Laws
622 Corporations
623 Corporations and Partnerships
624 Criminal Procedure
626 Debtor-Creditor Law
628 The Early Development of Anglo-American Common Law
630 Economics for the Lawyer
632 Energy, Natural Resources, and Telecommunications Law
636 Environmental Law
637 Equitable Remedies
638 Estate Planning
639 European Economic Community
640 Evidence
641 Fact Investigation and Discovery
642 Family Law
644 Federal Courts
646 Federal Income Taxation
647 Freedom of Expression
650 International Law
656 Interviewing and Counseling
658 Labor Law
660 Land-Use Planning
662 Law and Corporate Finance
664 Law Practice Dynamics
666 Law, Society, and Morality
668 Negotiations for Lawyers
670 Lawyers and Clients
677 Products Liability
680 Real Estate Transfer and Finance
682 Securities Regulation
684 Soviet Law
688 Taxation of Corporations and Shareholders

Problem Courses and Seminars

700 Business Planning
702 Children's Rights
703 Church and State
704 Comparative Administrative Law
705 Comparative Antitrust Law
706 Computer Applications in Law Practice and Legal Education
708 Constitutional Theory
710 Contemporary Legal Theory
712 Copyright
716 Death Penalty Seminar
718 Equal Protection Seminar
720 Estate Planning Seminar
722 Ethics of Corporate Practice
730 International Business Transactions
734 International Human Rights
742 Lawyers and the Legal Profession
744 Law and Medicine
752 Legal Aid I
753 Legal Aid II
756 Legislation
764 Organized Crime Control
766 Regulation of Corporate Behavior
768 The Role of Communities
770 Social Security Law
772 Theories of Property
774 Topics in Advanced Civil Procedure

Faculty Roster

Alexander, Gregory S., J.D., Northwestern U. Prof.
Aman, Alfred C., Jr., U. of Chicago. Prof.
Barceló, John J. III, S.J.D., Harvard U. A. Robert Noll Professor of Law
Clermont, Kevin M., J.D., Harvard U. Prof.
Cramton, Roger C., J.D., U. of Chicago. Robert S. Stevens Professor of Law
Eisenberg, Theodore, J.D., U. of Pennsylvania. Prof.
Farina, Cynthia, J.D., Boston U. Asst. Prof.
Gunn, Alan, J.D., Cornell U. J. du Pratt White Professor of Law
Hammond, Jane L., J.D., Villanova U. Prof.
Hay, George A., Ph.D., Northwestern U. Prof., Law/Economics

Henderson, James A., Jr., LL.M., Harvard U. Frank B.
Ingersoll Professor of Law
Hillman, Robert A., J.D., Cornell U. Prof.
Johnson, Sheri L., J.D., Yale U. Assoc. Prof.
Kent, Robert B., LL.B., Boston U. Prof.
Lyons, David B., Ph.D., Harvard U. Prof., Law/Philosophy
Martin, Peter W., LL.B., Harvard U. Prof.
Osgood, Russell K., J.D., Yale U. Prof.
Palmer, Larry L., LL.B., Yale U. Prof.
Roberts, Ernest F., LL.B., Boston Coll. Edwin H.
Woodruff Professor of Law
Rossi, Faust F., J.D., Cornell U. Samuel S. Leibowitz Professor of Trial Techniques
Siliciano, John A., J.D., Columbia U. Asst. Prof.
Simson, Gary J., J.D., Yale U. Prof.
Thoron, Gray, LL.B., Harvard U. Prof.
Williams, David C., J.D., Harvard U. Asst. Prof.
Williams, Susan H., J.D., Harvard U. Asst. Prof.
Wolfram, Charles W., LL.B., U. of Texas. Charles Frank Reavis Sr. Professor of Law
Zacharias, Fred C., LL.M., Georgetown U. Law Center. Asst. Prof.
Johnson Graduate School of Management

Administration

Curtis W. Tarr, dean
Thomas R. Dyckman, associate dean for academic affairs
Dick R. Wiltink, director, doctoral program
James W. Schmotter, associate dean for administration and acting associate dean for placement
Ann L. Calkins, assistant dean for external relations
Frederick T. Bent, coordinator of international programs
Mariea Blackburn, director of admissions
Paul Brenner, director of corporate relations
Nancy A. Culligan, business manager and director of personnel
Laurie Foltman, director of career services
Daniel Mansoor, director of development
Linda Myers, publications coordinator
Betsy Ann Olive, librarian
Hannel Peters, director of advising and student activities, and registrar
Linda Pike, managing editor, Administrative Science Quarterly
C. Clinton Sidle, director of finance and business operations and executive director of continuing education
Susan Stone, director of financial aid
L. Joseph Thomas, director of the Executive Development Program
Eugene Ziegler, director of computing services

The Johnson Graduate School of Management prepares men and women for managerial careers in business. The school offers course work in many disciplines to provide potential managers with an understanding of the complexities of the professional world in which they will operate and of the organizations of which they will become a part.

A bachelor's degree or its equivalent is required for admission to the two-year program leading to the Master of Business Administration (M.B.A.) degree. Nearly half of the students have a background of undergraduate studies in arts and sciences, and about one-quarter in engineering. One-quarter of the students begin their graduate training immediately after receiving their bachelor's degrees and the remaining three-quarters following work experience.

Combined degree programs allow highly qualified Cornell students to register in the school during their senior year, thereby earning a master's degree in less than the usual time.

The doctoral program, administered through the Graduate School, provides an advanced level of education in business for those who seek careers in teaching and research at leading universities.

More-detailed information about these programs is available in the Cornell University Announcement. Johnson Graduate School of Management, obtainable from the Office of Admissions and Student Affairs, Johnson Graduate School of Management, Malott Hall.

Undergraduate Only

NBA 300 Entrepreneurship and Enterprise
Prerequisite: Introductory Accounting or equivalent, or permission of instructor.

This course provides a disciplined look at the entrepreneur and small business management. It deals with the formation and the acquisition of enterprises from the viewpoint of individuals who desire to become the principal owners. Reviews include legal and tax aspects, valuation techniques, organization forms, and venture-capital sources, as well as planning techniques necessary to launch a successful venture.

NCC Common Core Courses

NCC 500 Financial Accounting
NCC 501 Quantitative Methods for Management
NCC 502 Microeconomics for Management
NCC 503 Marketing Management
NCC 504 Organizational Theory and Behavior
NCC 505 Macroeconomics and International Trade
NCC 506 Managerial Finance
NCC 507 Management Information Systems
NCC 508 Production and Operations Management
NCC 510 Business-Government Interface
NCC 511 Business Strategy and Policy

NBA Management Elective Courses

Accounting
NBA 500 Intermediate Accounting
NBA 501 Advanced Accounting
NBA 502 Managerial Cost Accounting
NBA 504 Taxation Affecting Business and Personal Decision Making
NBA 505 Auditing
NBA 506 Financial Information and Evaluation
NBA 507 Federal Income Tax

Behavioral Science
NBA 660 Strategy Implementation: Process and Politics
[NBA 661 Strategic Management and Behavioral Science Not offered 1986–87]
NBA 662 Power and Interpersonal Influence
NBA 663 Behavioral Decision Theory
NBA 669 Organizational Theory

Economics
NBA 520 Pricing and Strategy
NBA 521 Regulation, Deregulation, and Antitrust: Government Regulation of Business
NBA 522 Topics in Managerial Economics
NBA 523 Business and Economic Forecasting
NBA 524 Competitive Industry Analysis

Finance
NBA 540 Financial Policy Decisions
NBA 541 Economic Evaluation of Capital Investment Projects
NBA 542 Investment Management and Security Analysis

NBA 543 Financial Markets and Institutions
[NBA 544 Seminar in Bank Management Not offered 1985–86.]
NBA 545 Finance Theory
NBA 546 Options, Bonds, and Commodities
[NBA 547 Investment Banking Not offered 1986–87]
NBA 548 Trading
NBA 549 Strategic Decision Making

General Management
NBA 560 Business Law
NBA 561 Advanced Business Law
NBA 562 An Introduction to Estate Planning
[NBA 563 Strategic Business Policy Issues Not offered 1986–87]
NBA 564 Entrepreneurship and Enterprise
NBA 565 Law of Business Associations
NBA 567 Management Writing
NBA 568 Oral Communication
NBA 569 Effective Management Consulting
NBA 570 Negotiations for Managers
NBA 571 Business and American Society, 1800–1986

572 Law of Mergers and Acquisitions
NBA 573 The Professional Manager at Work
NBA 575 The Ethics of Managerial Power
NBA 577 The External Environment of Business

International Management
NBA 580 Industrial Policy: Lessons for the United States from Japan and Europe
NBA 582 International Trade and Finance
[NBA 583 International Business in the Middle East Not offered 1986–87]
NBA 584 International Management
[NBA 585 Comparative International Management Not offered 1986–87]
NBA 589 Business in Japan

Management Information Systems
NBA 600 Data-Base Management
NBA 601 Information Systems in Manufacturing
NBA 603 Systems Analysis

Marketing
NBA 620 Marketing Research
[NBA 621 Advertising Management Not offered 1986–87]
NBA 622 Marketing Strategy
NBA 623 Models and Methods for New Products
NBA 624 Marketing Decision Analysis
NBA 626 Consumer Behavior
NBA 628 Marketing Planning
NBA 630 Marketing Research Project
NBA 631 Marketing Science

Operations Management
NBA 640 Production Management
NBA 641 Business Logistics Management
NBA 642 Applied Econometrics
NBA 643 Management Science

Public Management
NBA 683 Managing Governmental Systems
NBA 684 Health-Services Organization and Financing
NBA 685 Health and Welfare Policy Analysis

NMI and NRE Research
NMI 500–502 Directed Readings and Research
NRE 502 Marketing Workshop
NRE 503 Doctoral Seminar in Economics
NRE 504 Doctoral Seminar in Accounting Not offered in 1986–87
NRE 505 Finance Workshop
NRE 506 Doctoral Seminar in Banking and Financial Markets Not offered 1986–87
NRE 507 Doctoral Seminar in Corporate-Finance Theory Not offered 1986–87
NRE 508 Doctoral Seminar in Operations Management
NRE 509 Doctoral Seminar in Organizational Behavior Not offered 1986–87
NRE 510 Applied Economics Workshop
NRE 512 Accounting Workshop
NRE 513 Doctoral Seminar in Finance
NRE 514 Doctoral Seminar in Decision Aiding
NRE 515 Doctoral Seminar in Organizational Research

Faculty Roster

Abdalla, Mitchell, Ph.D., SUNY at Stony Brook. Asst. Prof., Organizational Behavior
Anderson, Philip, Ph.D., Columbia U. Asst. Prof., Organizational Behavior
Battista, Roger M., Ph.D., U. of Michigan. Prof., Health Policy and Management
BenDaniel, David J., Ph.D., Massachusetts Inst. of Technology. Don and Margi Berens Professor of Entrepreneurship
Bent, Fredrick T., Ph.D., U. of Chicago. Assoc. Prof., Public Management
Bierman, Harold, Jr., Ph.D., U. of Michigan. Nicholas H. Noyes Professor of Business Administration, Business Administration/Finance
Bogliari, Joseph B., J.D., Cornell U. Prof., Agricultural and Business Law
Chan, Louis, Ph.D., Rochester U. Asst. Prof., Finance
Conway, Richard W., Ph.D., Cornell U. Prof., Information Systems
DeGrafa, Patrick, Ph.D., U. of Pennsylvania. Asst. Prof., Economics
Dyckman, Thomas R., Ph.D., U. of Michigan. Ann Whitney Olin Professor of Accounting, Accounting
Elliott, John A., Ph.D., Cornell U. Assoc. Prof., Accounting
Flash, Edward S., Jr., Ph.D., Cornell U. Assoc. Prof., Public Management
Freeman, John, Ph.D., North Carolina at Chapel Hill. Prof., Organizational Behavior
Gass, Jerome E., Ph.D., Carnegie-Mellon U. Prof., Managerial Economics and Finance
Hilton, Ronald W., Ph.D., Ohio State U. Assoc. Prof., Accounting
Jarrow, Robert A., Ph.D., Massachusetts Inst. of Technology. Assoc. Prof., Economics and Finance
Krackhardt, David, Ph.D., U. of California at Irvine. Asst. Prof., Organizational Behavior
Lind, Robert C., Ph.D., Stanford U. Prof., Economics, Management, and Public Policy
McAdams, Alan K., Ph.D., Stanford U. Assoc. Prof., Managerial Economics
McClain, Oldfield, George S., Ph.D., U. of Pennsylvania. Prof., Economics and Finance
McIntosh, Robert A., Ph.D., Massachusetts Inst. of Technology. Assoc. Prof., Economics and Finance
McIntosh, Robert H., Ph.D., Stanford U. Prof., Economics
Pempel, T., Ph.D., Columbia U. Visiting Prof., Government
Smiidt, Seymour, Ph.D., U. of Chicago. Nicholas H. Noyes Professor of Economics and Finance, Managerial Economics
Smiley, Robert H., Ph.D., Stanford U. Prof., Economics and Policy
Thaler, Richard H., Ph.D., U. of Rochester. Prof., Economics
Thomas, L. Joseph, Ph.D., Yale U. Nicholas H. Noyes Professor of Manufacturing, Operations Management
Wiggins, James B., Ph.D., Massachusetts Inst. of Technology. Asst. Prof., Finance
Wittink, Dick R., Ph.D., Purdue U. Prof., Marketing and Quantitative Methods

Adjunct and Visiting Faculty

Burlingame, John F. Executive in Residence, 1986–87
Lakonishok, Josef, Ph.D., Cornell U. Visiting Prof., Finance
Pempel, T., Ph.D., Columbia U. Prof., Government

Lecturers

Pike, Alan, M.A., Cornell U. Lect., Management Communication
Rosen, Charlotte, Ph.D., Cornell U. Sr. Lect., Coordinator, Management Communication
**Division of Nutritional Sciences**

**Administration**
Malden C. Nesheim, director
Marjorie M. Devine, associate director for academic affairs
Lemuel D. Wright, graduate faculty representative, Field of Nutrition
David Levitsky, division honors chairperson

**The Division**
Nutritional science deals with the intricate relationship of food, nutrition, and health. At Cornell, the focal point for this broad field of study, which ranges from nutrient chemistry to world hunger, is the Division of Nutritional Sciences. The division is affiliated with both the College of Human Ecology and the College of Agriculture and Life Sciences and brings together specialists from many disciplines in the biological and social sciences. Their work covers undergraduate and graduate teaching, nutrition research, and public education, including cooperative extension services.

The faculty in the division are working toward two closely related goals: increasing our knowledge of nutrition and health, and applying what we know to people’s everyday problems. This approach carries over to undergraduate education. Students who major in nutritional sciences learn how to interpret basic research from the laboratory and from the social sciences. They also come to understand the practical implications of their studies. Many students have the chance to test out their ideas by conducting a research project or working in the community.

**Facilities**
Most of the faculty of the division work in Savage Hall and Martha Van Rensselaer Hall. In addition to housing offices, classrooms, and seminar rooms, these buildings contain animal-care and research facilities, specialized laboratories, a human metabolic research unit, and interactive terminals for the University’s computer system. Savage Hall also has a graduate reading room, and in Martha Van Rensselaer Hall the division has set up the Learning Resources Center, which many undergraduates use for individual study and small group discussions. The Learning Resources Center contains class materials, audiovisual aids, and supplementary books and periodicals for independent study and special projects in nutrition.

**The Major**
The B.S. degree program with a major in nutritional sciences (NS) offers five major options, but all of them give students a thorough foundation in the basic sciences, the field of nutrition, and communication skills. Graduates are qualified for a variety of entry-level positions in laboratory research, consumer affairs, nutrition education, and clinical and public-health services. All students are well prepared to pursue dietetic training or advanced study in fields such as nutrition, food science, biomedical sciences, and public policy.

Most undergraduates who major in nutritional sciences enroll in the College of Human Ecology. Students in the College of Agriculture and Life Sciences can also pursue a nutritional sciences option through the General Studies Program, and students in the College of Arts and Sciences can take a nutrition concentration as an independent option in the Division of Biological Sciences. Nutrition courses can be used to meet graduation requirements in all three colleges.

**Academic Advising**
Every student majoring in nutritional sciences is assigned a faculty adviser from the division. An effort is made to match interests, and students may change advisers at any time if their goals and interests change. Regular student-adviser conferences are required at least twice a year. The adviser not only helps students select courses but can often suggest opportunities for individual study or experience outside the classroom.

The specific course requirements for graduation and for each major option are listed in the Human Ecology Student Guide, available on request. Questions about undergraduate study should be addressed to Marjorie Devine, associate director for academic affairs, 334 Martha Van Rensselaer Hall.

**The Core Curriculum**
In their freshman and sophomore years, all undergraduates majoring in nutritional sciences follow a core curriculum that builds the foundation for any aspect of advanced study in nutrition. The core curriculum includes courses in food and nutrition, laboratory skills, humanities and communications, introductory social sciences, and basic sciences. There is some choice of science courses, but all nutrition students need a good background in general and organic chemistry, biochemistry, microbiology, physiology, and mathematics.

Transfer students need to pay particular attention to the core curriculum and may need to take an extra semester to fulfill all of the basic requirements, especially in the sciences. The course NS 300, Special Studies for Undergraduates, which allows students to take “pieces” of courses, helps transfer students integrate their previous training into the requirements for the nutritional sciences major without duplicating coursework.

By their junior year, students start taking the more specialized courses required for the nutritional sciences option they choose: experimental and consumer food studies, nutrition, nutritional biochemistry, clinical nutrition, or community nutrition. The core curriculum ensures that they can move into any option or change options.

**Options**

**Experimental and Consumer Food Studies**
Students electing this option concentrate on basic and applied science courses, including physicochemical aspects of food, experimental food methods, and nutrition. With their knowledge of how the composition and treatment of food affect food quality, safety, acceptability, and nutritive value, graduates find jobs in industry, food service, research and development and evaluation of food products, food and nutrition education, consumer service, and public policy. To support these career options, additional course work is recommended in areas such as dietetics, food-service administration, communications, economics, government, public policy, marketing, and management.

**Nutrition**
This option is designed for students who have interests in the scientific bases of nutritional and food sciences. The program of lectures and laboratories in biochemistry, physiology, and microbiology provides a basis for graduate study in either human nutrition or food. The option also offers the opportunity to plan a concentration of varied courses to meet specific career goals.

**Nutritional Biochemistry**
This basic science-oriented curriculum prepares students for advanced study in the nutritional and biomedical sciences. Students who wish to explore more broadly the scientific basis of food and nutrition may wish to concentrate in this area. Courses and laboratory work in chemistry, biochemistry, and physiology help develop a deeper understanding of nutrient action at the subcellular level.

**Clinical Nutrition**
This option builds on the basic science core to form a solid foundation in the biological aspects of human nutrition. Designed for students interested in pursuing advanced study in human nutrition or medicine, the program stresses courses and laboratory work in the natural and biological sciences with an emphasis on application to human problems.

**Community Nutrition**
This option gives students the skills to help people translate nutritional knowledge into action. It provides a strong background in basic and nutritional sciences but also includes supporting courses in the social sciences and communications. Practical experience through supervised field study is strongly recommended and is an asset to finding entry-level positions in nutrition education, community agencies, or field research.

**Dietetics**
Students interested in applied nutrition should consider planning their course work to meet the requirements for membership and registration in the American Dietetic Association (ADA). Courses and electives that will meet the requirements of all five nutritional sciences major options can fulfill the ADA’s basic and specialized academic requirements as well. Students are then eligible to pursue the remaining ADA requirements after graduation: the experience component or internship required for membership and for registration, and the national certifying examination required for a registered dietitian.

Advisers in the division will help students plan their course work to meet the ADA’s academic requirements and will counsel them on applying for internships. Additional information on the dietetics program at Cornell can be obtained from Rose Marie Holmes, 314 Martha Van Rensselaer Hall, and Joan M. L. Koch, 373 Martha Van Rensselaer Hall.

**Field Study Program**
Structured field experience in a community agency or health-care facility can be taken for credit in several ways: through an independent study course, as a class project, or as a summer study project. Interested students should consult Nancy Peckenpaugh, the division’s field-study coordinator.

**Independent Study Electives**
Independent study courses (NS 400, 401, 402) can be used to obtain credit for more diverse or intensive experience than the classroom can offer, whether this
involves laboratory work, library research, or field study. Any student interested in independent study should obtain the sponsorship of a faculty adviser and the approval of Dr. Devine or consider applying to the honors program.

Honors Program

The honors program, leading to a B.S. degree with honors in nutritional sciences, gives official recognition to students who have demonstrated excellence in their academic work and their capacity for independent study.

In addition to fulfilling the requirements for a major option in nutritional sciences, students in the honors program take courses on designing and evaluating research, complete an original piece of research, and prepare an honors thesis. The honors project may be laboratory or field research or deal with policy and program development.

For more information, students should contact David Levitsky, honors chairperson, 114 Savage Hall.

Exercise Science Concentration

Students interested in physical fitness and nutrition may pursue a concentration in exercise science through a special program with the School of Health, Physical Education, and Recreation at Ithaca College. This program includes elective courses in fitness measurements, exercise physiology, and biomechanics of human movement. For further information, contact M. M. Devine, associate director for academic affairs, 334 Martha Van Rensselaer Hall.

Courses Recommended for Nonmajors

Courses in nutritional sciences can strengthen programs of study in biological science, medicine, agriculture, food science, human services, and other fields.

Introductory courses in nutrition (NS 115) and food (NS 146) are open to all students, as are some special-interest courses (NS 222, Maternal and Child Nutrition; NS 325, Sociocultural Aspects of Food and Nutrition; and NS 457, National and International Food Economics).

Nonmajors who have taken college courses in chemistry, biological sciences, and nutritional sciences may elect advanced food and nutrition courses with the permission of the instructor.

Graduate Programs

Graduate study is administered by the Field of Nutrition, a group of more than forty faculty members from throughout the University who have a common interest in nutritional problems. In the M.S. and Ph.D. degree programs, students may major in animal nutrition, human nutrition, international nutrition, nutritional biochemistry, foods, or general nutrition. A Professional Master of Nutritional Science (M.N.S.) degree in clinical nutrition combines academic study and research on campus with clinical training at affiliated institutions in Upstate New York and New York City. Field experience is also a component of concentrations in community nutrition, public-health nutrition, and nutrition education.

The specialties and interests represented by faculty in the Field of Nutrition provide almost unlimited opportunity for graduate study. Cornell’s extensive laboratory and agricultural facilities ensure that students interested in experimental nutrition have exceptional choice and thorough training. As the largest faculty in the country devoted to the study of human nutrition, the field includes specialists in biochemical, metabolic, epidemiological, and sociocultural research. Opportunities to work with community and federal agencies are available, and students interested in applied nutrition and public policy, and students in international nutrition are expected to conduct their thesis research abroad.

For more information about the graduate program, interested persons may write for the brochure Graduate Study in Nutrition; available from the Graduate Faculty Representative, Field of Nutrition, Cornell University, Savage Hall, Ithaca, New York 14853-6301.

Courses

115 Ecology of Human Nutrition and Food 
Fall or spring. 3 credits. Prerequisites: fall, high school biology; juniors and seniors with advanced biological science background should check with the instructor; spring, a one-semester college biology course. S-U grades optional.

Fall: M W F 1:25; spring: M W F 11:15. Four discs scheduled in place of some lecs. Evening prelims: times to be arranged. M. Devine.

An introduction to the field of human nutrition and food. Includes study of human nutritional needs; problems encountered in providing food to meet nutritional needs; relationships among physiological needs, sociocultural systems, food, and the significance of these relationships to health and wellness. Discussion of current issues such as weight control, vegetarianism, diet, and cancer.

146 Introductory Foods 
Fall and spring. 3 credits. Each section limited to 16 students. Prerequisite: NS 115 or concurrent registration. Permission of instructor during course registration required (permission-of-instructor forms must be obtained from, and returned to, 335 Martha Van Rensselaer Hall).


Criteria for evaluating the practices of the science of food and nutrition. Laboratory includes an introduction to the physicochemical properties of foods and the relationship of these properties to preparation techniques and palatability characteristics of food. Medical problems of human nutritional needs and the management of money and time, is included.

222 Material and Child Nutrition 
Spring. 3 credits. Prerequisites: NS 115 and a college biology course. S-U grades optional.

M W F 11:15. Evening prelims to be announced. C. Olson.

Involves the study of nutritional requirements in pregnancy, lactation, infancy, and childhood growth through adolescence. Topics include the relationship between maternal diet and pregnancy outcome; analysis of different methods of infant feeding; and nutritional status of pregnant women, children, and adolescents in the United States and in developing countries.

246 Introduction to Physicochemical Aspects of Food 
Fall or spring. 4 credits. Each section limited to 18 students. Prerequisites: a college course in organic chemistry or biochemistry NS 146, and permission of instructor during course registration (permission-of-instructor forms must be obtained from, and returned to, 335 Martha Van Rensselaer Hall). S-U grades optional.


A study of (a) the colloigative properties of solutions; (b) colloidal systems and gels, foams, and emulsions; (c) physical and chemical properties of the major groups of foods, the effect of basic methods of food preparation and preservation on these properties, and their relation to food quality—especially color, flavor, and texture. Laboratories introduce the experimental study of food and illustrate the function of ingredients and effect of treatment on food quality.

300 Special Studies for Undergraduates 
Fall or spring.

Special arrangements to establish equivalency for courses not transferred from a previous major or institution. Students prepare a description of the study they want to undertake, on a form available from the Counseling Office, N105 Martha Van Rensselaer Hall. The form designed by both the instructor directing the study and the associate director for academic affairs, is filed at course registration or during the change-of-registration period.

301 Nutritional Aspects of Raw and Processed Foods (also Food Science 301) 
Spring. 3 credits. Prerequisites: NS 115 and organic chemistry or permission of instructor.


An evaluation of the nutritional qualities of human foods with emphasis on changes that occur during processing and storage. Methods and approaches for nutritional evaluations, including nutrient content, nutrient density, nutrient quality, and nutrient bioavailability measurements, are discussed. Other topics include nutrient stability, nutrient labeling, descriptions of the contribution of various commodities, food fortification, and food additives.

302 Field Study with Cooperative Extension 
Fall. 2 credits. Limited to 10 juniors and seniors.

Prerequisites: NS 115 and permission of instructor. S-U grades optional. Not offered 1986–87. Fall, F 12:20–4; field trips to nearby counties are arranged. Staff.

Upperclass students, working as a team, select a current nutrition issue and prepare and present a program to a regularly scheduled cooperative extension audience. The course stresses ways to present food and nutrition information to various types of lay audiences. Methods used may include small-group discussion, food demonstration, illustrated lecture, and radio and newspaper communication. The importance of accurate information and an awareness of knowledge audience needs and interests is stressed. Each student prepares a leaflet of information that is distributed during the group program. Students should reserve Friday afternoon for field trips and teaching experiences.

325 Sociocultural Aspects of Food and Nutrition 
Fall. 3 credits. Limited to juniors and seniors.

Prerequisites: NS 115 and a college course in anthropology or sociology.


The course offers a cross-cultural perspective for understanding the environmental and sociocultural parameters affecting the development of food consumption patterns. Emphasis is on theories on formation of food habits, dietary methodologies, ethnicity and food habits, and educational programs in nutrition, in national and international contexts.

331 Physiological and Biochemical Bases of Human Nutrition 
Spring. 3 credits. Prerequisites: Biological Sciences 330 or 331 and NS 115 or equivalent. S-U grades optional.


The biochemical and physiological bases for human nutrition requirements, including digestion and absorption, energy metabolism, food intake regulation, protein amino acids, minerals, vitamins, and determination of nutritional status.

332 Laboratory Methods in Nutritional Sciences 
Fall or spring. 3 credits. Each section limited to 18 students. Prerequisites: NS 331 or concurrent registration and permission of instructor during course registration (permission-of-instructor forms must be obtained from, and returned to, 335 Martha Van Rensselaer Hall).
358 Nutritional Sciences

347 Human Growth and Development: Biological and Social Paralogical Correlations (also Human Development and Family Studies 347) Spring. 3 credits. Prerequisites: Biological Sciences 101 or 105 or equivalent; Human Development and Family Studies 115 or Psychology 101 and NS 115 or equivalent. Offered alternate years. M.W.F. 1:25. J. Haas, H. Ricciuti.

A review of major patterns of physical growth from the fetal period to late adulthood, with consideration of biological and socioenvironmental determinants of growth, as well as physical and psychological consequences of variations in growth patterns. An examination of the normal pattern of growth followed by an analysis of major sources of variations (normal and atypical). Fall, spring.

361 Biochemistry and Human Behavior (also Psychology 361) Fall. 3 credits. Prerequisites: Biological Sciences 101—102, Chemistry 103—104, Psychology 123, or permission of instructor. A fundamental knowledge of human biology and chemistry is required. M.W.F. 11:15. D. Levitsky.

A survey on the scientific literature of the role of brain and body biochemical changes as determinants of human behavior. The topics covered include action and effects of psychopharmacologic agents, biochemical determinants of mental retardation, biochemical theories of psychosis, and effects of nutrition on behavior. Spring.

378 Management Principles in Foodservice Operation Spring. 4 credits. Prerequisites: NS 246 and Agriculture, or Hotel Administration 211 or Industrial and Labor Relations 121 or 151 or equivalent, or permission of instructor. S-U grades optional. T. 10:10—10:55. R. Holmes.

Application of management principles to foodservice operations involved in the production, distribution, and service of food products and job. Includes menu planning, foodservice layout and design, production and service controls, purchasing, food-cost control, personnel management, sanitation, and safety. Summer.

389 Honors in Nutritional Sciences Fall. 1 credit. Limited to students admitted to the division honors program. S-U grades only. T. 2:30—4. D. Levitsky.

Research design. Analysis of research papers on selected topics.

400—401—402—403 Special Studies for Undergraduates Fall or spring. Credits to be arranged. S-U grades optional.

Division faculty.

For advanced independent study by an individual student or for study on an experimental basis with a goal of preparing for a graduate degree in a field of nutritional sciences not otherwise provided through course work in the division or elsewhere at the University. Students prepare a description of the study they want to undertake, on a form to be signed by the instructor directing the study and the appropriate director of academic affairs. The form, available from the Counseling Office, is filed at course registration or within the change-of-registration period. To ensure review before the close of the course registration or change-of-registration period, students should submit the special-studies form to the appropriate director of academic affairs as early as possible.

400 Directed Readings Fall. For study that predominantly involves library research and independent reading.

401 Empirical Research Fall. For study that predominantly involves data collection and analysis or laboratory or studio projects.

402 Supervised Fieldwork Fall. For study that involves both research and teaching. Master's degree. S-U grades optional.

403 Teaching Apprenticeship Fall. For study that includes assisting faculty with instruction.

415 Field-based Learning in Nutrition Fall, spring or summer. 2—6 credits. S-U grades optional.

Prerequisites: junior, senior or graduate standing; 9 hours of course work in DNS; participation in preferred activities and a learning workshop; and permission of instructor. Obtaining application/questionnaire in DNS Undergraduate Office (335 Martha Van Rensselaer Hall).

Hours in placement arranged individually, biweekly seminar to be announced. N. J. Peckenpaugh.

Undergraduate and graduate students are placed, according to their interests and backgrounds, in community organizations and agencies that provide nutrition and food services. Students are individually designed to enable students to apply nutrition concepts learned in the classroom. A biweekly seminar provides a basis for sharing of experiences among students and for integration of theory and practice. Students may be required to provide their own transportation to placements.

441 Nutrition and Disease Fall. 4 credits. Prerequisites: NS 331 and a human physiology course. S-U grades optional. M.W.F. 10:10 and 8:50. V. Utterhohet.

Study of the physiologic and metabolic anomalies in chronic and acute illnesses and the principles of nutritional therapy and prevention. The topics covered include diabetes mellitus, starvation, obesity, nutritional assessment, nutritional pharmacology, severe injury, infection, cancer, gastrointestinal diseases, liver disorders, renal diseases, cardiovascular diseases, and pediatrics. Original research papers, books, review papers, and publications of professional organizations are used throughout the course.

442 Diet Formulation and Analysis Fall. 2 credits. Limited enrollment. Prerequisites: NS 146, concurrent registration in NS 441, or concurrent registration in both courses. Permission of instructor. In course registration and permission of instructor for course registration. Permission-of-instructor forms must be obtained from, and returned to, 335 Martha Van Rensselaer Hall. S-U grades optional.

Development of skills in formulation and analysis of therapeutic dietary regimens. Various sources of information on food composition, diet planning, and enteral and parenteral nutrition supplements are used.

445 Community Nutrition and Health Spring. 3 credits. Prerequisites: NS 331 or concurrent enrollment in 331. Recommended: NS 325. S-U grades optional.

The field component of this course may involve off-campus activity; students are responsible for their own transportation or bus fare.


Introduction to principles and procedures of experimental design, analytical techniques, and data analysis in human nutrition. Emphasis on methods of analysis of nutrients and metabolites in food, tissues, and body fluids. Application of these methods in assessing physiological and biochemical responses to alterations of nutrient intake in animal and human studies.

446 Physiochemical Aspects of Food Fall. 3 credits. Prerequisites: NS 246 and a college course in biochemistry, which may be taken concurrently. S-U grades optional. M.W.F. 9:05. G. Armbruster.

The relation of food quality to (a) rheological properties of food systems, (b) oxidation and reduction reactions, and (c) enzymatic and nonenzymatic browning. Covers physical and chemical factors accounting for the color, flavor, and texture of natural and processed foods.


Laboratory experiments designed to illustrate the effect of varying ingredients and treatment on the quality of food products. Objective testing methods are used to determine food quality characteristics.

458 Physiochemical Aspects of Food—Laboratory Fall. 1 credit. Limited to 16 students. Prerequisite: NS 446 or concurrent registration. S-U grades optional. M.W.F. 1:25—4:25. G. Armbruster.

Laboratory experiments designed to illustrate (a) the physiochemical behavior of colloidal systems, (b) chemical reactions of food components, and (c) effects of temperature, pH, moisture, inorganic salts, and enzymes on physiochemical changes in natural foods, food components, and food mixtures.

456 Experimental Foods Methods Spring. 3 credits. Limited to 16 students. Prerequisites: NS 446 and 448. Recommended: a course in statistics.

Application of the scientific method in the design and performance of experimental food problems and the interpretation and evaluation of results. Evaluation of the use of instruments and chemical and sensory methods in the measurement of food properties. Independent project.

457 National and International Food Economics Spring. 3 credits. Prerequisite: a college course in economics and junior standing or permission of instructor. S-U grades optional. M.W.F. 9:05. E. Thorbecke.

Examination of individual economists essential for an understanding of the United States and world food economies. Analysis of the world food economy. Review and analysis of (a) the major economic factors determining the demand for food, the composition of food consumption, and nutritional intake; and (b) the major economic factors affecting food production and supply. Examination and evaluation of the effectiveness of various food policies and programs in altering food consumption patterns. Principles of nutritional planning in developing countries within the context of the process of economic and social development.

488 Advanced Management in Foodservice Systems Fall or spring. 3 credits. Limited to 30 students. Prerequisites: NS 378, Microbiology 290 and 291, a course in learning theory, and permission of instructor during course registration. Permission-of-instructor forms must be obtained from, and returned to, 335 Martha Van Rensselaer Hall. S-U grades optional. Possible field trip. Uniform required.


Some laboratories will be arranged through Cornell Dining. Other experiences may be possible in community foodservice operations. Students will gain experience in care and use of institutional equipment,
job analysis, volume food production, applied sanitation, and in-service training, as well as other management skills required to operate a foodservice program.

498 Honors in Nutritional Sciences Spring. 1 credit. Limited to students admitted to the division honors program. Students may register in NS 499 concurrently.

T R 2:15-5:15. D. Levitsky, coordinator.
In course presentation and discussion of current topics in food and nutrition which all members participate. Written reports on topics discussed may be requested. Deliniation of honors research problems in consultation with faculty advisor.

499 Honors Problem Fall and spring. Credits to be arranged. Open only to students in the division honors program.

Disc. T 11:15 plus additional hours to be arranged. Division faculty. D. Levitsky, coordinator.
An independent literature, laboratory, or field investigation. Students should plan to spread the work over two semesters.

600 Special Problems for Graduate Students Fall or spring. Credit to be arranged. Limited to graduate students recommended by their chairperson and approved by the instructor in charge. S-U grades only.

Hours to be arranged. Division faculty.
Emphasis on independent advanced work. Experience in research laboratories in the division may be arranged.

601–604 Advanced Nutrition Series
A series of nutrition courses offered jointly by the Division of Nutritional Sciences and the Departments of Animal Science and Poultry Science. Prerequisites: courses in nutrition, physiology, and biochemistry, including intermediary metabolism, or permission of instructor.

601 Proteins and Amino Acid in Nutrition (also Animal Science 601) Fall. 2 credits.
Prerequisites: physiology, biochemistry, and nutrition or permission of instructors.

W F 11:15, R. E. Aujic, M. Morrison.
A course in amino acid and protein nutrition with emphasis on the dynamic aspects of protein digestion and amino acid absorption, protein and amino acid metabolism, nutrient interrelationships, assessment of protein quality, and amino acid availability and amino acid requirement in humans, other monogastrics, and ruminants.

602 Lipids Fall. 2 credits.

T R 11:15, A. B. Lewis.
A advanced course on biochemical, metabolic, and nutritional aspects of lipids. Emphasis is on critical analysis of current topics in lipid methodology, lipid absorption, lipoprotein secretion, structure, and catabolism; mechanisms of hormonal regulation of lipolysis and fatty acid synthesis; and cholesterol metabolism and atherosclerosis.

604 The Vitamins Fall. 2 credits.

T R 10:10, G. F. Combs, Jr.
Lectures on nutritional aspects of the vitamins, including recent developments in nutritional and biochemical interrelationships with other nutrients and metabolites.

607 Nitrogen Metabolism (also Biological Sciences 650) Spring. 2 credits.
Prerequisites: Chemistry 358 or 360 and Biological Sciences 330 or 331 or permission of instructor. Offered alternate years, alternating with NS/BS 635, Metabolic Regulation.

T R 10:25, M. Yaghjian.
The course will cover most aspects of nitrogen metabolism. The first section will consider nitrogen fixation and assimilation in bacteria and the metabolism and biological importance of purines, pyrimidines, porphyrins, alkaloids, and amines. This will be followed by discussion of the pathways of amino acid biosynthesis and degradation. The final section will include discussion of protein turnover and degradation, nitrogen excretion, and interorgan relationships in higher organisms. Emphasis throughout the course will be on hormonal, developmental, and molecular biological aspects of metabolic regulation and evolutionary differences.

611 Molecular Toxicology (also Toxicology 611) Spring. 2 credits.
Prerequisite: full-year 400-level course in biochemistry or equivalent. S-U grades optional. Offered alternate years.

T R 11:15, C. Wilkinson, C. Campbell, A. Aronson, and others.

612 Methods of Assessing Physical Growth in Children Spring. 3 credits. Limited to graduate students and students who have permission of the instructor. S-U grades optional. Offered alternate years.

T R 11:15, J. Brady, B. Lewis, R. Shallenberger.
A consideration of the chemistry of carbohydrates, including sugars and complex carbohydrates (starches, pectins, hemicelluloses, gums, cellulose, and conjugated carbohydrates). Emphasis is on the intrinsic chemistry, functionality in food systems, and the changes occurring during food processing and storage.

615 Obesity and the Regulation of Body Weight (also Psychology 513) Spring. 3 credits. Limited to 30 students.
Prerequisites: one course in psychology, one course in nutrition. Undergraduate students may register with permission of instructor. S-U grades optional. Offered alternate years.

T R 13:00–3:05. D. Levitsky.
This course is a multidisciplinary discussion of the causes, effects, and treatments of human obesity. Topics include the biopsychology of eating behavior, genetics of obesity, role of activity and energy metabolism, psychosocial determinants of obesity, anorexia nervosa, therapy and its effectiveness, and social discrimination.

614 Topics in Maternal and Child Nutrition Fall. 3 credits. Prerequisites: NS 331, and 222 or 347, Biological Sciences 311, and permission of instructor.

T R 9:05–10:30, K. Rasmussen.
Advanced course on the role of nutrition during pregnancy and lactation. Feeding and growth of infants and children in health and disease is considered. Critical evaluation of current literature is emphasized.

616 Readings in Food Fall. 2 credits. Prerequisite: organic chemistry. Recommended: biochemistry S-U grades optional. May be repeated for credit with permission of instructor.

T M 7:30–9:25 p.m. N. Mondy.
Critical review of selected topics in the current literature. Emphasis on experimental data and basic scientific principles underlying modern theories and practice relative to food quality. Training in oral and written presentations of scientific reports.

617 Teaching Seminar Fall or spring, first half of semester 1 credit. Limited to division graduate students and students who have permission of the instructor. S-U grades only.

T M 7:30–9:30 p.m. M. Devine, N. Yaghjian.
A series of workshops focusing on development of teaching skills for guiding classroom learning in lecture, discussion, and laboratory settings. Preparation of content, presentation, and interaction techniques and evaluative methods are emphasized in relation to the student's specific teaching assignment. Videotape simulations provide opportunity for practice and analysis of teaching behaviors.

618 Teaching Experience Fall or spring. No credit. Limited to division graduate students and students who have permission of instructor.

Hours to be arranged. Division faculty. M. Devine, coordinator.
Designed to provide experience in teaching nutritional sciences by direct involvement in college courses under supervision of a faculty member. Perspectives of teaching and the degree of involvement vary depending on the needs of the course and the experience of the student.

619 Field of Nutrition Seminar (also Animal Science 619) Fall or spring. No credit. S-U grades only.

M 4:30. Faculty and guest lecturers.
Lectures on current research in nutrition.

620 Food Carbohydrates (also Food Sciences 620) Spring. 2 credits. Prerequisites: Biological Sciences 330 or equivalent. Letter grades only. Offered alternate years.

T R 11:15, J. Brady, B. Lewis, R. Shallenberger.
A consideration of the chemistry of carbohydrates, including sugars and complex carbohydrates (starches, pectins, hemicelluloses, gums, cellulose, and conjugated carbohydrates). Emphasis is on the intrinsic chemistry, functionality in food systems, and the changes occurring during food processing and storage.

626 Special Topics in Food Fall. 2 credits.

Hours to be arranged. G. Ambruster, B. A. Lewis.
Current research related to food is reviewed in the context of basic principles and their application to the quality of food.

627 Special Topics in Food Spring. 2 credits.
Prerequisite: organic chemistry. Recommended: biochemistry S-U grades optional. May be repeated for credit with permission of instructor.

Current research related to food production and processing as well as toxicants in the food chain will be reviewed.

630–633 Advanced Nutrition Laboratory Fall or spring. 1–5 credits. Limited to 12 students.

Division faculty.
Laboratories on the anthropometric, dietary, clinical, and biochemical assessment of human nutritional status. The individual courses are taught in sequence over the entire semester. Any or all of the modules may be taken for credit.

630 Anthropometric Assessment Spring, weeks 1–3. 1 credit.
Prerequisites: NS 331 or equivalent and permission of instructor.

T 2:30–5:30, S 9–12. J. Haas.
Presentation of methods and procedures for anthropometric, radiographic, and energetic assessment of children and adults in clinical, research, and survey settings.

631 Dietary Assessment Fall. 1 credit.
Prerequisites: statistics and NS 331 or equivalent, and permission of instructor.

Study of methods and techniques for assessing dietary intakes at the individual and household levels.

632 Clinical Assessment Spring. 1 credit.
Prerequisites: NS 630, 631, and 441; Biological Sciences 330 or 331, and Biological Sciences 430; and permission of instructor.

T R 15:5–15:15. V. Utermohlen and division faculty.
Study of methods and techniques for clinical assessment of nutritional status and diagnosis of nutritional disorders.

633 Human Metabolic Studies Spring. 1 credit.
Prerequisite: NS 331. Limited to 20 students. S-U grades only.
360 Nutritional Sciences

Hours to be arranged. 6 meetings over a 3-week period. 2 ½ hours each. D. Roe. Instruction in the principles of human metabolic studies and how these are carried out. Includes how to plan and write a protocol for a study; how to select an appropriate experimental design; how to select subjects; how to design, prepare, and analyze diets; how to make collections of urine and feces; and how to examine data for subject period and treatment effects. Assigned readings which will be discussed in class, will be from selected recent papers in which techniques of human metabolic studies are described. Learning experiences will include participation in a six-day study.

[634 Vitamins and Coenzymes (also Biological Sciences 634)] Spring. 2 credits. Prerequisites: organic chemistry 253 or 357–358 and Biological Sciences 331 or 330, or their equivalents in biochemistry. Offered alternate years. Not offered 1986–87, next offered 1987–88. T R 10:10. M. N. Kaszanoff. The chemical, biochemical, and nutritional aspects of the vitamins and coenzymes.

[635 Mechanisms of Metabolic Regulation (also Biological Sciences 635)] Biweekly. 2½ hours each. D. Roe. Spring 2 credits. Prerequisites: Chemistry 358 or 360 and either Biological Sciences 330 or 331 or permission of instructor. Offered alternate years, alternating with NS 607/654. Nitrogen Metabolism. Not offered 1986–87, next offered 1987–88. T R 9:05. M. Watford. Lectures only. The identification and characterization of regulatory steps in metabolism is considered from both theoretical and practical aspects. The intracellular mechanisms of regulation are stressed, with specific examples examined in detail.

636 Integration and Coordination of Energy Metabolism (also Biological Sciences 637) Fall. 3 credits. Prerequisites: Biological Sciences 330 and 331, or equivalent. T R 12:20. B. Lewis; spring, R. Parker. The elements and dynamics of energy metabolism in higher animals are systematically developed through biochemical characterizations of the metabolic components and structure of major tissues and organs; stressing correlations with physiologic functions. Mechanisms that control energy metabolism within individual tissues and coordinate these processes in the intact animal are analyzed in the contexts of selected physiologic and pathologic stresses.

637 Epidemiology of Nutrition Spring. 3 credits. Limited to graduate students. Hours to be announced. J-P Habicht. Course covers basic principles of nutritional epidemiology, evaluation, and surveillance. The concept of nutrition as a determinant of health, the evidence required to support conclusions on causality, and confounding are examined. This provides a basis for describing the principles and practice of nutritional surveillance, with emphasis on its relation to planning decisions to alleviate malnutrition in developing countries.

638 Epidemiology of Nutrition Fall. 2–3 credits. Limited to graduate students. Prerequisites: Statistics and Biometry 602 or 604 and NS 331 or equivalent. Hours to be arranged. J-P Habicht. Teaches the principles underlying the evaluation of nutrition intervention programs and of nutritional assessment. Reviews the levels of evidence about nutrition and health for making decisions, indicators of nutritional status in populations, and design of nutritional evaluations. Teaches principles of using nutritional information for decision making.

645 Seminar on Community Nutrition Issues Spring. 2 credits. Limited to graduate students with a major or minor in human nutrition. S-U grades optional.

646 Seminar in Physiochemical Aspects of Food Fall or spring. 1–3 credits. Prerequisite: a college course in organic chemistry or biochemistry. S-U grades optional. T R 9:05; disc to be arranged. Fall: B. Lewis; spring, R. Parker. An introduction to physiochemical aspects of food, for graduate students who have had limited or no work in this area. The seminar uses the lectures of NS 246 as a basis for supplementary readings and critical review of research on selected topics.

649 Geriatric Nutrition Spring. 3 credits. Prerequisite: NS 331. Letter grade only. M W F 10:10, plus 20 hours during the semester working with elderly individuals in the Ithaca area. D. Roe. Emphasis is given to effects of aging, particularly as these change food habits, alter digestive processes, or decrease nutrient utilization. Causes of nutrient overload and nutritional deficiency are described. Nutritional assessment of elderly people is explained, together with precautions that must be taken in interpreting findings. Consideration is given to geriatric nutrition as an important responsibility of nutritionists working in hospitals, extended-care facilities, and community programs. Therapeutic aims considered are the provision of nutritional rehabilitation in acute-care hospitals and of specific diet therapy for chronic-disease patients. Community program objectives are discussed, including establishment and maintenance of feeding programs for the elderly.

650 Clinical and Public Health Nutrition Spring. 3 credits. For graduate students with a major or minor in nutrition and undergraduate nutrition majors in their senior year. Prerequisite: NS 331 or equivalent. M W F 9:05. D. Roe. Lectures cover social, environmental, and disease variables that influence the nutrition of infants, children, and adults. Endemic nutritional problems (such as obesity, dental caries, and anemias) of public health importance in the United States are discussed. Students are offered an off-campus activity. Students are responsible for their own transportation.

651 Nutrition and the Chemical Environment (also Toxicology 651) Fall. 3 credits. Prerequisite: NS 331 or equivalent. S-U grades optional. M W F 11:15. D. Roe. The relationship between nutrition and the effects of foreign chemicals. Students are offered an overall view of compounds to which we are exposed, including natural food toxicants, food additives, water pollutants, pesticide residues, and radioactive wastes, as well as medications and illegal drugs. A factual and scientific background is developed so students can interpret information and misinformation circulated in the news media.

652 Nutrition Counseling Spring. 2 credits. Limited to graduate students in the Clinical Nutrition Program. Prerequisites: NS 441 and 442 and permission of instructor. S-U grades only. 2 hours per week to be arranged. J. Koch. Principles and procedures of nutritional counseling in clinical practice. Emphasis on subject matter and process skills necessary to develop, implement, and evaluate nutritional care plans for individuals and groups. Includes workshops, simulation techniques, and work with clients in selected settings.

659 The Nutrition and Physiology of Mineral Elements (also Veterinary Medicine 759) Fall. 2 credits. Prerequisites: basic physiology, intermediate biochemistry, and general nutrition. Offered alternate years. T R 9:05. R. Schwartz, D. VanCampen, R. Wasserman. Lectures on nutritional aspects and physiological, biochemical, and hormonal relationships of the prominent macro- and microelements, with emphasis on recent developments. Included is information on methodologies of mineral research and the chemistry of ions and complexes, as well as essentiality, requirements, transport, functions, homeostasis, interrelationship, and toxicity of various mineral elements.

660 Special Topics in Nutrition Fall or spring. 3 credits maximum in each term. Registration by permission of the instructor. Hours to be arranged. Division faculty. Designed for the student who wants to become informed in any specific topic related directly or indirectly to nutrition. The course may include individual tutorial study, experience in research laboratories, a lecture series on a special topic selected by a professor or a group of students, and/or selected lectures of another course already offered.

669 Field Seminar January intersession or spring semester. 1 credit. Limited to 12 students. Required for graduate students in clinical nutrition. Open to other graduate students in nutrition with permission of instructor. V. Utermohlen, M. Devine, R. Holmes. Overview of policy decision making and implementation of nutrition programs at the state and national levels. Seminars alternate between Washington, D.C. (even years), and Albany, New York (odd years). Provides opportunities to meet and confer with staff members of selected governmental and private agencies. Upon return to campus an integrated summary report is required prior to group discussion.

670 Clinical Field Studies Fall, spring, or summer. 15 credits maximum. Limited to graduate students in clinical nutrition. Prerequisites: NS 441, 442, 652, 630, 631, 632, and 633. S-U grades only. Full-time study at off-campus clinical sites. R. Holmes, V. Utermohlen. The delivery of nutritional care in hospitals, outpatient clinics, and community settings.

680 International Nutrition Problems, Policy and Programs Spring. 3 credits. Prerequisite: permission of instructor. T R 11:15–12:30. M. Latham. Designed for graduate students who want to learn about the important nutritional problems of developing countries. The major forms of malnutrition related to poverty and their underlying causes are discussed. Emphasis is placed on programs and policies that can assist poor countries and communities to improve their nutritional and health status.

700 Special Topics in Toxicology (also Toxicology 699) Fall or spring. 1-3 credits. S-U grades optional. Hours to be arranged. Staff. A discussion of the most current developments in various areas of toxicological research and testing. Faculty and students will participate jointly in evaluating research findings and provide seminars and discussion of such material. For information regarding topic, instructor, and credit, contact the office of the Institute for Cooperative and Environmental Toxicology, N202 Martha Van Rensselaer Hall (telephone: 256-8112).

702 Seminar in Nutritional Toxicology (also Toxicology 702) Fall or spring. 1 credit. S-U grades only. F 12:20. Staff. The seminar program covers varied topics in biochemical, genetic, nutritional, veterinary, and regulatory toxicology. Included are presentations of basic research studies as well as fundamental concepts and research activities involving environmental problems of a toxicological nature. Presentations are given by Cornell and visiting speakers.

703 Seminar in Nutritional Science Fall or spring. 1 credit. S-U grades only. T 12:20 or W 12:20. Division faculty.

899 Master's Thesis and Research Fall or spring. Credit to be arranged. Prerequisite: permission of the chairperson of the graduate committee and the instructor. S-U grades optional. Hours to be arranged. Division graduate faculty.

999 Doctoral Thesis and Research Fall or spring. Credit to be arranged. Prerequisite: permission of the chairperson of the graduate committee and the instructor. S-U grades optional. Hours to be arranged. Division graduate faculty.

Faculty Roster

Arion, William J., Ph.D., U. of N. Dakota. Prof.
Armbruster, Gertrude, Ph.D., Washington State U. Assoc. Prof.
Bensadoun, Andre, Ph.D., Cornell U. Prof., Nutritional Science/Physiology.
Bisogni, Carole, Ph.D., Cornell U. Assoc. Prof.
Brink, Muriel S., M.S., Michigan State U. Assoc. Prof. Campbell, T. Colin, Ph.D., Cornell U. Prof.
Cowell, Catherine, M.S., U. of Connecticut. Adjunct Prof.
Devine, Marjorie M., Ph.D., Cornell U. Prof.
Gillespie, Ardyth, Ph.D., Iowa State U. Asst. Prof.
Haas, Jere D., Ph.D., Pennsylvania State U. Assoc. Prof.
Habicht, Jean-Pierre, Ph.D., Massachusetts Inst. of Technology. James Jamison Professor of Nutritional Epidemiology.
Kazarinoff, Michael N., Ph.D., Cornell U. Asst. Prof., Nutritional Sciences/Biochemistry, Molecular and Cell Biology.
Levitsky, David A., Ph.D., Rutgers U. Assoc. Prof.
Lewis, Brenda A., Ph.D., U. of Minnesota. Assoc. Prof.
Mondy, Nell I., Ph.D., Cornell U. Prof.
Morris, Mary A., Ph.D., U. of Wisconsin. Prof.
Nesheim, Malcolm C., Ph.D., Cornell U. Prof.
Olson, Christine M., Ph.D., U. of Wisconsin. Assoc. Prof.
Parker, Robert S., Ph.D., Oregon State University. Asst. Prof.
Rivlin, Richard S., M.D., Harvard U. Adjunct Prof.
Sanjur, Diva M., Ph.D., Cornell U. Prof.
Sowers, Mary F., Ph.D., U. of Iowa. Asst. Prof.
Stephenson, Lani, Ph.D., Cornell U. Asst. Prof.
Stilpanait, Martha H., Ph.D., U. of Wisconsin. Asst. Prof.
Thorbecke, Erik, Ph.D., U. of California. H. E. Babcock Professor of Economics and Food Economics.
Utermohlen, Virginia, M.D., Columbia U. Assoc. Prof., Nutritional Sciences/Biochemistry, Molecular and Cell Biology.
Wright, Leman D., Ph.D., Oregon State Coll. Prof. Emeritus.
Zilversmit, Donald B., Ph.D., U. of California. Prof., Nutritional Sciences/Biochemistry, Molecular and Cell Biology.

Joint Appointees

Clark, Larry C., Asst. Prof., New York State College of Veterinary Medicine/Nutritional Sciences.
Combs, Gerald F., Jr., Assoc. Prof., Poultry Science/Nutritional Sciences.
Krock, Lennart P., Prof., New York State College of Veterinary Medicine/Nutritional Sciences.
Miller, Dennis, Asst. Prof., Food Science/Nutritional Sciences.
VanCampen, Darrell R., Assoc. Prof., U.S. Plant, Soil, and Nutrition Laboratory/Nutritional Sciences.
VanSoest, Peter J., Prof., Animal Science/Nutritional Sciences.
Wasserman, Robert H., Prof., New York State College of Veterinary Medicine/Nutritional Sciences.

Faculty Roster 361
Lieutenant Colonel Clarence R. Buchwald, United States Army, Professor of Military Science and Commanding Officer, United States Army ROTC Instructor Group

Military Science

Lieutenant Colonel Clarence R. Buchwald, Field Artillery, United States Army, Professor of Military Science and Commanding Officer, U.S. Army ROTC Instructor Group

Major Ken C. Williams, Infantry, United States Army
Major John M. Graham, Medical Service Corps, United States Army Reserve
Captain Rodney O. Luce, Field Artillery, United States Army
Captain Vincent J. Scully, Infantry, United States Army
Captain Olin T. Parker, Adjutant General, United States Army

United States Army ROTC Program

The primary objective of the Army Officer Education Program at Cornell is to develop and commission men and women who have the qualifications and potential for service as officers in the United States Army. Important components of the United States Army. Intermediate objectives are to provide students with an understanding of the fundamentals of responsibility, integrity, self-discipline, as well as an appreciation of the citizen’s role in national defense. The application of the decision-making process to a variety of situations is given major emphasis as a valuable aid in developing leadership potential.

These objectives are achieved through a program normally covering four years. However, a two-year program is available and is discussed in a later section. The program includes specific courses in military science, more general academic subjects that assure a well-rounded education, practical training in leadership through participation in the Cadet Corps (including attendance at a one-week summer camp at an Army installation), and the opportunity to participate in a number of extracurricular activities.

The combination prepares the student for commissioning and effective performance in most of the many branches of the Army. The student’s academic major, academic performance, leadership ability, and personal desires and the needs of the Army determine the branch of the Army in which he or she is commissioned upon graduation.

Requirements for Enrolling

Applicants must be citizens of the United States. (Noncitizens may enroll and will receive certificates acknowledging completion of the course but do not receive commissions.)

An applicant’s vision must be correctable to a minimum of 20/20 in one eye and 20/400 in the other eye. Height must be at least sixty inches for men, fifty-eight inches for women, and no more than eighty inches for men and seventy-two inches for women, although exceptions will be considered. The weight requirement varies according to height and sex. Overall sound mental and physical condition is essential, and students are required to undergo periodic physical examinations.

Enrollment in the program is subject to the approval of the professor of military science. Enrollment in specific courses by students not formally enrolled in the program must be approved by course instructors.

Four-Year Program

The Four-Year Program is open to students in their freshman year or, with the approval of military and University authorities, to sophomores in a five-year degree program. Veterans of the Armed Forces of the United States and students entering Cornell with AROTC credit from secondary or military schools (Junior Division AROTC) may receive advanced standing.

Under the Four-Year Program students pursue the Basic Phase (Mil S I and II) during the first two years, and the Advanced Phase (Mil S III and IV) during the next two years. A total of twelve credits of military subjects is required. In addition, academic-enrichment courses are required in such fields as communication arts, psychology, management, political science, and foreign languages. Specific requirements are determined by the student and his or her adviser after initial enrollment. Throughout the four years, cadets spend an additional two hours each week in practical leadership training for which there is no academic credit. All cadets attend a six-week camp, with pay, between the junior and senior years.

Basic Phase (Mil S I and Mil S II)

Students in the first year of the Basic Phase take one classroom course in military science in the fall and spring semesters, for which they receive academic credit. These courses include study of the United States organization for defense, principles and techniques of leadership and management. Students also participate in leadership modules that include rappelling, orienteering, drill and ceremony, physical training, winter survival, and map and compass use. These modules are designed to promote personal development and enrichment. While these activities do not receive academic credit, students receive physical education credit. Typical freshman participation in Army officer education is 48% program-related hours.

During the fall of the second year, the student takes a three-credit class in military history, including the evolution of warfare and armed conflict in society. In the spring, the student takes a one-credit course in map reading and spends approximately two hours a week in practical leadership training, land navigation, and military skills.

Advanced Phase (Mil S III and Mil S IV)

The Advanced Phase of the Four-Year Program is open to students who have successfully completed the Basic Phase and are accepted by the professor of military science for further enrollment. It is also open to students who have gained appropriate advanced standing through either successful completion of basic summer programs (see the description of the Two-Year Program) or prior military training. Any student entering the Advanced Phase must have two years of academic work remaining at Cornell or another degree-granting institution. The student must pass such physical and aptitude tests as may be prescribed. In addition, the past performance and desire of each student is evaluated to determine if he or she has the potential for eventual commissioning.

When students are accepted for the Advanced Phase, they execute a written contract with the United States government. Under terms of the contract, they agree to complete the Advanced Phase and to accept a commission if tendered. Concurrently with the signing of the contract, students enlist in the United States Army Reserve for control purposes.

Classroom study in the Advanced Phase includes one military science course each semester on such subjects as leadership and management, small-unit tactics, and command and staff organization and functions. The two hours a week of practical leadership training continues, and between the junior and senior years all cadets attend a six-week advanced summer camp currently conducted at Fort Bragg, North Carolina.

Two-Year Program

The Two-Year Program consists of the last two years (the Advanced Phase) of the regular Four-Year Program. In order to qualify for the Two-Year Program, a student must successfully complete a basic six-week summer camp or receive placement credit for prior military service.

The Two-Year Program is open to selected students who have two years of academic study remaining at Cornell or another degree-granting institution. Applications are accepted October to April of the sophomore year. Selectees complete the basic six-week camp before registering in the Advanced Phase the following fall. They must also meet specified physical requirements and execute the same written contract as those students who enter the Advanced Phase after completing the regular Basic Phase.

Scholarships

Scholarships are awarded on the basis of merit and are available for one, two, three, or four years. AROTC scholarships are awarded each year to outstanding basic camp participants and students in the freshman and sophomore classes. Cadets who are awarded scholarships continue to receive support until graduation as long as they fulfill the requirements. The active duty requirement for all scholarship students is four years. Scholarship cadets receive funding for University tuition, required fees, required textbooks, and classroom materials for the duration of their scholarship. Scholarship cadets and advanced course cadets also receive $100 a month for up to ten months a year.

Commissioning

All students who successfully complete the Advanced Phase, including the advanced summer camp, are commissioned as second lieutenants in the United States Army Reserve or the Regular Army upon graduation.

Distinguished Military Graduates

Selected senior cadets with high academic achievement and outstanding military qualities are designated Distinguished Military Graduates (DMGs). All cadets, scholarship and nonscholarship, are eligible to compete. DMGs may be commissioned in the Regular Army rather than the Army Reserve, those who are so commissioned enter the Army on the same basis as graduates of the United States Military Academy at West Point.

Service Obligations

A variety of active duty and reserve combinations are available. Non-scholarship cadets must spend either three years on active duty and five more years in an inactive reserve status, or three to six months on active duty followed by membership in Reserve units for six years. The manpower requirements of the Army determine the proportion of officers who serve in each category.
An officer beginning three years active duty first attends the Basic Officer Course (normally eight to twelve weeks) of the assigned branch. Upon completion of the course the officer is assigned to a unit and location that is determined by the desires of the individual and the requirements of the Army. Those officers selected for three to six months attend the Basic Officer Course, after which they are released to reserve status.

Non-scholarship cadets accepting a Regular Army commission serve a minimum of three years on active duty followed by five years in an inactive reserve status. Scholarship cadets, whether commissioned in the Regular Army or the Reserve, generally serve four years on active duty and four years in reserve status; however, some may serve eight years on reserve duty.

Choice of Branch
Cadets in the second year of the Advanced Phase (normally the senior year) may specify the branch of the Army—such as Infantry, Corps of Engineers, Armor, Signal Corps, Artillery, Air Defense, Ordnance, Chemical, Adjutant General, Judge Advocate General, Finance, Medical Service, Military Intelligence, Military Police—in which they prefer to serve. They are notified in the spring, before commissioning, of the branch to which they are assigned. The likelihood of appointment in a chosen branch depends upon the student’s academic and officer education performance, degree area, and the needs of the Army at that time.

Graduate Study
Active duty deferments may be granted to individuals who want to attend graduate school at their own expense. Requests will be considered on the basis of needs of the service. Admission to graduate school is the student’s responsibility.

Benefits
Each cadet in the Advanced Phase (Mil S III and Mil S IV) receives $100 a month for up to four months a year. While attending the advanced summer camp (between the junior and senior years), each cadet receives approximately $600 and an allowance for travel to and from camp. Uniforms, textbooks, and supplies required for AROTC instruction are provided by the Army. A cadet in the Two-Year Program receives the same payments as cadets in the Advanced Phase and, in addition, receives approximately $450 and a travel allowance for basic summer camp attendance before entering the Advanced Phase.

Military Science Courses
All cadets take one course and a laboratory module each semester in military science. The number of hours a week spent in the classroom varies from semester to semester, as does the credit received for each course. Students in the Four-Year Program are required to take all of the courses listed for the junior and senior year and the military history course.

Freshman Year (Mil S I)

MIL S 101 United States Organization for Defense
Fall. 1 credit. Required.
Staff.
Students examine the United States defense apparatus in terms of organization, mission, personnel, and relationships among military forces and between the military forces and various branches and departments of the government. The United States Army force structure is examined at all levels. The complexities and magnitude of operating the defense organization are studied to provide a framework for subsequent instruction.

MIL S 102 Social and Organizational Psychology in the Military Environment
Spring. 1 credit. Required.
Staff.
This course allows the student to develop a basic understanding and appreciation of the theories of social and organizational psychology and behavior as they apply to the military setting. Attention is given to leader types, the source and exercise of authority, and the impact of varying styles of leadership on motivation and organization effectiveness. The student is introduced to the concepts of integrity, ethics, and professionalism.

Sophomore Year (Mil S II)

MIL S 211 Armed Conflict and Society
Fall. 3 credits. Required.
Staff.
This course provides practical knowledge of the various forms of topographic representation. Students interpret and use maps in terrain association and land navigation. Knowledge of topography is complemented by an orientation on significant environmental influences from physical, social, and climatic factors. Portions of the course offer practical experience in land navigation and orienteering.

Junior Year (Mil S III)

MIL S 332 Theory and Dynamics of the Military Team
Fall. 2 credits. Required.
Staff.
An initial introduction to techniques of presenting briefings, the student is provided with a broad understanding of the principles and application of teamwork in military organizations. Particular emphasis is given to leadership responsibilities of the commander as the team coordinator. Additionally, the student has an opportunity to develop an understanding of the roles and contributions of the various branches of the Army in support of the military team.

MIL S 332 Leadership in Small-Unit Operations
Spring. 2 credits. Required.
Staff.
This course provides an understanding of the nature of decision making and the tactical application of the military team. Through the use of conferences and extensive practical exercises, students develop familiarity with the factors influencing the leader’s decisions; the processes of planning, coordinating, and directing the operations of military units to include troop-leading procedures; and development of operation plans and orders.

Senior Year (Mil S IV)

MIL S 424 Contemporary Military Environment I
Fall. 2 credits. Required.
Staff.
An overview of the functions, responsibilities, and interrelationships between the small-unit leader, the commander, and the staff, using a combat arms battalion as a typical organizational structure. Detailed discussions focus on actions of the small-unit leader, communication skills, the military justice and legal system, the threat environment, and the logistical support of the army in the field.

MIL S 461 Contemporary Military Environment II
Spring. 2 credits. Required.
Staff.
A continuation of Mil S 424. Students examine the leadership environment of the Army officer. Conferences and seminars examine the techniques of effective military leadership with special attention given to professionalism and ethical considerations in the armed forces during peacetime and armed conflict.

Practical Leadership Training
All Army Officer-Education Students
In the leadership laboratory, all of these objectives are accomplished by emphasizing practical exercises and firsthand experience. Types of practical laboratory activities include an introduction to rifle marksmanship, mountaineering, physical training, land navigation and orienteering, signal communications, tactics, and orientation and training exercises at military installations.

As with many laboratory periods, no credit is given, and participation is required for successful completion of the AROTC program. Students will receive physical education credit for the laboratory. Students register as follows:

MIL S I Leadership Laboratory I
Fall. Spring.
MIL S 141 Spring.
MIL S 342
This cadet selects either rappelling-drill and physical training, or ranger training. In the spring, class choices are winter survival—land navigation or ranger training. These interesting and challenging activities do not provide academic credit but may be used for physical education credit if adequate hours have been accrued.

MIL S II Leadership Laboratory II
Fall. Spring.
MIL S 242
Not offered.
MIL S 243
Not offered.
MIL S 341 MIL S 342
Cadets meet for two hours each week as members of the cadet organization to participate in practical leadership exercises. Types of practical activities include familiarization in rifle marksmanship, orienteering, drill and ceremonies, signal communications, physical fitness training, and tactics and field exercises.

MIL S III Leadership Laboratory III
Fall. Spring.
MIL S 341 MIL S 342
Not offered.
MIL S 344
Cadets meet for 1 1/2 hours a week to prepare for a six-week summer camp that follows the junior year. Emphasis is on the development of individual skills in leadership techniques and practical skills. Cadets rotate among leadership positions to develop an ability to apply decision-making processes to a myriad of situations. They also acquire technical expertise and proficiency in signal communications, physical fitness, drill and ceremonies, rappelling, orienteering, tactics, water survival, and other military skills.

MIL S IV Leadership Laboratory IV
Fall. Spring.
MIL S 441 MIL S 442
Senior cadets plan and operate the leadership laboratory programs for the I–III cadets. The development of planning and supervisory skills is emphasized. Cadets have an opportunity to practice leadership skills developed during previous AROTC training and summer camp experiences.

Naval Science

Captain Edward W. Colbert, Jr., United States Navy, Professor of Naval Science and Commanding Officer, Naval ROTC Unit Commander Max R. Tea, United States Navy Major Ronald Dutil, United States Marine Corps
The objective of the Naval Officer Education Program is to prepare selected students for service as commissioned officers in the United States Navy or United States Marine Corps by supplementing their undergraduate education with instruction in essential concepts of naval science and fostering development in the qualities of leadership, integrity, and dedication to their country and the naval service. The program is compatible with most undergraduate major fields of study, including five-year baccalaureate degree programs.

The objective is achieved through a broad program, normally covering four years, that combines specific courses in naval science and specified academic subjects to supplement weekly laboratory sessions in which the practical aspects of naval science and leadership procedures are stressed. It also includes at least one summer-at-sea period.

Non–naval officer education students. Though the Navy program has been designed to prepare future officers, Navy courses are open to all students at Cornell University as space limitations allow.

Requirements for Enrollment
An applicant for Naval ROTC at Cornell must be a citizen of the United States. Applicants must have reached their seventeenth birthday by June 30 of the entering year and must be eligible to enter the University in the United States or at an NROTC campus. Waivers of the upper age limit, up to age twenty-nine on June 30 of the year in which commissioning is sought, may be granted on an individual basis by the Chief of Naval Personnel. Applicants must also meet physical and medical requirements. Interested students should visit the Naval Officer Education Unit in Barton Hall.

Programs
There are two types of Navy programs: the Scholarship Program and the College Program. They differ primarily in benefits to the student and type of commission earned.

Scholarship Program
The Naval Officer Education Program provides six thousand scholarships in over fifty-five universities nationwide to selected students who want to serve in the Navy or Marine Corps. Financial support is provided students during college preceding the award of the baccalaureate degree.

Benefits
The program provides uniforms, full tuition, most instructional fees, textbooks, nonconsumable supplies, and $100 a month for a maximum of forty months.

Summer Training
Each summer, students in the Scholarship Program spend approximately four to six weeks on a Navy ship, the unit sail-training vessel Alliance, or with a naval activity anywhere in the world for on-the-job training.

Active Duty Requirements
As required by Section 2107, Title 10, United States Code, selected applicants must enlist in the United States Naval Reserve for six years in pay grade E-1 (seaman recruit) before being appointed midshipman, USN, and receiving compensation. Students that are commissioned by the NROTC Naval-Marine Corps Scholarship Program for reasons beyond their control may be granted an individual basis.

Choice of Assignment
Graduates have an opportunity to request the duty they prefer upon graduation. These requests are given careful consideration, and every effort is made to assign the newly commissioned officer the duty of his or her choice.

Naval Science Courses
All Navy and Marine midshipmen take one naval science course together each semester during their freshman and sophomore years. Marine-option students continue to take a naval science course each semester during their junior and senior years. Marine-option students are required to take only the amphibious warfare course in either their junior or senior year, depending on when the course is offered. The number of hours a week spent in the classroom varies semester to semester, as does the credit received for each course.

Freshman Year
Nav S 101 Fundamentals of Naval Science
Fall. No credit.

Second requirement is a naval science course each semester. The last set of requirements consists of other required courses prescribed by the Navy to meet the growing need for more and better technically educated junior officers.

Naval Professional Laboratories
Nav S 141–142, 241–242, 341–342, or 441–442
All students in the naval program participate in one ninety-minute laboratory session each week. The session is held from 2:30 until 4:00 on Wednesday afternoon. This period is planned and implemented for the most part by the midshipmen officers in the battalion organization and consists of both drill and professional instruction and underway training aboard the unit's sixty-foot sailing training yawl or five small sailboats. Students gain experience in actual leadership situations and at the same time learn the fundamentals of seamanship, military formations, movements, commands, discipline, courtesies, and honors. During instruction briefings special emphasis is given to applied leadership as it relates to the administrative and managerial aspects of a Navy or Marine Corps officer's duties.

Naval Science Courses
All Navy and Marine midshipmen take one naval science course together each semester during their freshman and sophomore years. Marine-option students continue to take a naval science course each semester during their junior and senior years. Marine-option students are required to take only the amphibious warfare course in either their junior or senior year, depending on when the course is offered. The number of hours a week spent in the classroom varies semester to semester, as does the credit received for each course.

Freshman Year
Nav S 101 Fundamentals of Naval Science
Fall. No credit.

First, by applying for the national competition each year. This entails filling out and sending an appropriate application; being interviewed; having a physical examination; and applying to, and being accepted by, one of the NROTC colleges or universities throughout the country.

Second, by enrolling in the College Program at Cornell and being recommended by the professor of naval science for a scholarship after at least one year in the program.

Third, by entering through the Two-Year Program Scholarship.

College Programs
There are two College Programs available. Both lead to a commission in the Navy or Marine Corps Reserve and three years of active duty.

The regular College Program is three to four years long. Academic requirements for students in this program are somewhat less than those for scholarship students, as noted in the curriculum section of this booklet.

The Two-Year College Program begins the summer before the junior year, when students attend a required program with pay at the Naval Science Institute in Newport, Rhode Island.

Summer Training
Each student, summer in the Scholarship Program spend approximately four to six weeks on a Navy ship, the unit sail-training vessel Alliance, or with a naval activity anywhere in the world for on-the-job training.

Active Duty Requirements
As required by Section 2107, Title 10, United States Code, selected applicants must enlist in the United States Naval Reserve for six years in pay grade E-1 (seaman recruit) before being appointed midshipman, USN, and receiving compensation. Students that are commissioned by the NROTC Naval-Marine Corps Scholarship Program for reasons beyond their control may be granted an individual basis.

Choice of Assignment
Graduates have an opportunity to request the duty they prefer upon graduation. These requests are given careful consideration, and every effort is made to assign the newly commissioned officer the duty of his or her choice.

Among the types of assignments are duty in nuclear-power engineering for surface ships and submarines, naval aviation, and large and small surface ships.

Marine Corps Options
The United States Marine Corps is an integral part of the Naval Service and is commanded by the Commandant of the Marine Corps. One-sixth of the NROTC scholarship students may be Marine selectees who will be designated Marine-option midshipmen. Upon successful completion of the program they will be appointed second lieutenants in the United States Marine Corps.

Marine-option midshipmen will follow the same program as other NROTC midshipmen for the first two years. Beginning with the junior year, Marine-option midshipmen will be taught Marine courses by a Marine officer instructor. For the first class summer-cruise (after the junior year), known as the Bulldog Cruise, Marine-option students will travel to Quantico, Virginia. After the Basic School, the Marine officer is assigned duty in a variety of occupational fields. Among the duties available are Infantry, Aviation, Artillery, Tracked Vehicles, Engineers, Communications, Electronics, Supply, Administration, and Computer Science. The officer may serve on board naval vessels or at shore installations of the Marine Corps or Navy in this country or overseas.

The Marine Corps has a postgraduate educational system similar in objectives and organization to that of the Navy. Marine officers selected for aviation receive flight training at the Naval Air Station, Pensacola, Florida, along with their Navy counterparts.

Curriculum
A student has three categories of requirements to fulfill as a midshipman in the Naval Officer Education Program. The first of these requirements is a weekly naval professional laboratory each semester. The second requirement is a naval science course each semester. The last set of requirements consists of other required courses prescribed by the Navy to meet the growing need for more and better technically educated junior officers.

Naval Professional Laboratories
Nav S 141–142, 241–242, 341–342, or 441–442
All students in the naval program participate in one ninety-minute laboratory session each week. The session is held from 2:30 until 4:00 on Wednesday afternoon. This period is planned and implemented for the most part by the midshipmen officers in the battalion organization and consists of both drill and professional instruction and underway training aboard the unit's sixty-foot sailing training yacht or five small sailboats. Students gain experience in actual leadership situations and at the same time learn the fundamentals of seamanship, military formations, movements, commands, discipline, courtesies, and honors. During instruction briefings special emphasis is given to applied leadership as it relates to the administrative and managerial aspects of a Navy or Marine Corps officer's duties.

Naval Science Courses
All Navy and Marine midshipmen take one naval science course together each semester during their freshman and sophomore years. Marine-option students continue to take a naval science course each semester during their junior and senior years. Marine-option students are required to take only the amphibious warfare course in either their junior or senior year, depending on when the course is offered. The number of hours a week spent in the classroom varies semester to semester, as does the credit received for each course.

Freshman Year
Nav S 101 Fundamentals of Naval Science
Fall. No credit.

One-hour class each week (lecture-recitation). Navy staff.

A study of fundamental aspects of naval science including its conceptual contributions to sea power, factors involved in the physical development of naval forces, resources which must be managed, and prospects for the future.

Nav S 102 Naval Ship Systems (also Mechanical and Aerospace Engineering 101)
Spring. 3 credits.
Three lecture-recitation classes each week.
R. L. Wehe, Navy staff.
An introduction to primary ship-systems and their interrelationship. Basic principles of thermodynamics, propulsion, electrical operation, internal communications, electronics, ship structure, and other marine systems are considered.

**Nav S 157 Principles of Sailing** Fall and spring. Physical education credit. One class each week. Navy staff. Instructed in basic sailing skills and safety principles. Students sail small and large boats on Cayuga Lake, weather permitting. Focus is U.S. Navy Class B inshore skipper certification.

**Sophomore Year**

**Nav S 201 Naval Weapons Systems** Fall. 3 credits. Prerequisites: Mathematics 192 or 112 and Physics 207 or 213. Lecture-recitations, M W F B. Navy staff. The principles and theories used in the development of naval weapons systems are examined. Initially, extensive study is made of sensing and detection systems, especially radar and sonar, followed by discussions of ancillary systems for computing, tracking, stability, and weapons control and delivery. The latter part of the course covers the total derivation of the fire-control problem and specific U.S. Navy weapons.

**Nav S 202 Seapower—History of the Navy** Spring. 2 credits. Two seminars each week. Navy staff. Discussions examine the history of the Navy as a force in diplomacy. Relationships between Congress and the military for determining the national defense policy are also explored. The last section of the course concentrates on the balance between the superpower navies today.

**Junior Year (Navy)**

**Nav S 301 Principles of Navigation (also Agricultural Engineering 305)** Fall. 4 credits. Four classes each week (lecture-recitation-project work). The course covers coordinate systems, chart projections, navigational aids, instruments, compass observations, tides and currents, and soundings. It also includes celestial navigation, time, spherical trigonometry, motion of the stars and sun, star identification, position fixing, use of the nautical almanac, electronic navigation systems, and air navigation.

**Nav S 302 Naval Operations** Spring. No credit. One one-hour class each week. Navy staff. The course covers the application of command and control principles and the integration of sensors and weapon systems in the conduct of naval operations. Visual and electronic communications methods, data systems employment, tactical disposition of forces, and fleet logistics support are studied. Topics in shiphandling are also discussed.

**Senior Year (Navy)**

**Nav S 401 Organizational Behavior and Small Group Processes (also Hotel Administration 414)** Fall. 3 credits. Current research is examined to provide a conceptual framework for understanding group processes within organizations. In addition, students participate in experiential laboratories aimed at enhancing their effectiveness as leaders of groups. Topics include stages of group development, leadership, decision making, motivation, individual versus group needs, organizational communication, power, and organizational change.

**Nav S 402 Naval Administration Topics** Spring. No credit. A variety of topics important to the naval officer for both professional and managerial development are reviewed. The material is directed at the midshipman for his own understanding of naval administration and for use in the role of the division officer in counseling his subordinates. Through the use of lectures, situation problems, and role playing, the student will learn about the various aspects of Navy management and administration.

**Additional Required Course**

This course may be taken at any time during a student's undergraduate academic career.

**Nav S 310 Armed Conflict and Society** Fall. 3 credits. 3 classes each week. Presentations by Marine Corps and Navy instructors with guest lecturers, primarily from government and history departments. A study of modern warfare that examines the relationship of military strategy to geography, economics, sociology, technology, and national political realities and values; the evolution of warfare, including principles of warfare, weapons, and associated equipment; and the effects of nuclear weapons and guerrilla warfare on traditional concepts of national strategy.

**Junior or Senior Year (Marines)**

**Nav S 410 Amphibious Warfare** Spring. 3 credits. Three lectures-recitations each week. Marine Corps staff. The history of the development, theory, techniques, and conduct of amphibious operations in the twentieth century. Special emphasis will be on amphibious operations conducted in the central Pacific during World War II.

**Other Required Courses**

**Naval Option**

In order to receive commissions in the United States Navy, midshipmen must complete all the requirements for a baccalaureate degree as well as certain academic requirements specified by the Navy. Most fields of study for majors leading to a baccalaureate degree and having a direct applicability for the unrestricted line are permitted with the approval of the professor of naval science. Examples of fields of academic study of interest to the Navy for educating officers of the unrestricted line are:

- Asian studies
- Chemistry
- Computer science
- Economics
- Engineering
- European studies
- Foreign affairs
- History
- Latin American studies

Although there are few restrictions placed upon Naval-option College Program students (or any Marine-option students) with respect to academic majors, it is important to understand the vital need for mathematics and science in the modern Navy. College Program students who want to be most competitive for a scholarship are encouraged to select majors in those fields listed above.

Other required courses depend on the commissioning program in which the Navy-option midshipmen are enrolled and are given in the following sections.

**Scholarship Program Naval-Option Students**

All Navy-option scholarship students must complete two semesters of science-level calculus (six credits minimum) by the end of the sophomore year and two semesters of calculus-based physics (six credits minimum) by the end of the junior year. Scholarship Program Navy-option students who do not major in chemistry, engineering, mathematics, physics, computer science, oceanography, operations analysis, or the physical sciences must also select technical courses for 50 percent of all electives not required by the University academic program or by the NROTC program courses.

**College Program Navy-Option Students**

College Program students who desire entry into the Navy-option Scholarship Program should fulfill all of the requirements applicable to Navy-option scholarship students to be eligible and competitive for a Professor of Naval Science (PNS) scholarship.

**Marine Option**

Any Navy midshipman, in either the Scholarship Program or the College Program, who completes all of Cornell University's degree requirements, including a baccalaureate degree and having a direct applicability for the unrestricted line major in engineering or having a direct applicability for the unrestricted line major in chemistry, is eligible for a commission in the United States Marine Corps Reserve. Marine-option students take the same academic courses and naval professional laboratories as Navy-option students for the freshman and sophomore years. During the junior and senior years, Marine-option students meet with the Marine officer instructors one hour each week and take two naval science courses. In addition, two semesters of any course (a minimum of three hours each) in the following subject areas are required, the intent being to broaden the base of knowledge of the individual. The specific course choices must be approved by a Marine Officer Instructor (MOI).

- Anthropology
- Behavioral sciences
- Communication methods
- Computer science (upper level)
- Economics
- Geography
- Languages
- Management engineering
- Philosophy
- Political science
- Sociology
- World history

**University Courses**

A wide range of courses satisfy Naval ROTC science and engineering electives or social sciences and humanities requirements. Students should consult their naval science instructor or adviser concerning appropriate course selections. A partial list of those Cornell University courses that meet academic requirements of the program follows:

| Calculus | Math 111, 112 or 122 Calculus
| Physics | Math 191, 192, or 194 Calculus for Engineers
| Chemistry | Phys 112, and 213 or 217
| Computer Science | Phys 207 - 208 Fundamentals of Physics
| World History | Physics 101 - 102 General Chemistry
| Introductions to Chemistry | H Adm 171 - 172 Food Chemistry
| Introduction to Computer Programming | Chem 103 - 104
| Computer Aided Design | CS 314 Introduction to Computer Systems and Organization
| Computer-aided Design | CS 315 Introduction to Computers and Programming
| Computer Science | M&E 388 Introduction to Computers in Planning
| Computer Science | Adm 114 Information Systems I
| Engineering Drawing | Ag En 151 Introduction to Agricultural Engineering and Computing
| Engineering Drawing | Ag En 152 Engineering Drawing
| Economics and Social Statistics | I & R 211 Economic and Social Statistics

**Extracurricular Activities**

The Navy ROTC student at Cornell is offered a broad range of activities in which to participate. Each summer, as an optional part of their summer training,
The Two-Year Program is open to male and female students with two years remaining at Cornell (graduate or undergraduate) or at schools under crosstown or consortium agreement. Applications are accepted from October through April of the year preceding the applicant's planned entry into the program. Selection is based on academic performance and those successfully complete a six-week summer training program at government expense.

Scholarships

The Air Force awards more than six thousand scholarships annually. Four-year AFROTC scholarships are awarded to selected high school seniors. Scholarships of 3½, 2½, and 2 years are awarded annually on a competitive basis to students enrolled in the Air Force Officer Education Program. Applicants for the Two-Year Program are also eligible for scholarship consideration. Financial status or the award of other scholarships does not disqualify applicants for AFROTC scholarship awards. Acceptance of an AFROTC scholarship does not commit an individual to serve any additional time on active duty with the Air Force. The vast majority of scholarships for 2, 2½, 3½, and 4 years are limited to students mapping in engineering, science, and nontechnical majors. A limited number of four-year scholarships are available to those enrolled in nontechnical academic majors such as business administration, accounting, and management. Some two- and three-year scholarships are awarded to students in nontechnical academic majors who desire to become navigators or missile launch officers. A scholarship cadet receives a $100/month, tax-free subsistence allowance, all tuition, and a stipend for the cost of textbooks for the duration of the scholarship.

Fees

A uniform deposit of $30 is required. Students are also encouraged to contribute to a Cadet Activities Fund to cover the cost of most of their social activities.

Benefits

All cadets in the advanced program (POC) receive a $100-a-month, nontaxable subsistence allowance for the academic year. During the four- or six-week summer field training each cadet receives pay allowances authorized by current directives, plus an allowance for travel to and from the field site. Most textbooks and supplies required for Department of Aerospace Studies courses are provided.

All cadets are eligible to participate in field trips made to Air Force bases throughout the country. Scholarship and advanced cadets (POC) are entitled to space-available travel on Air Force aircraft flying within the continental United States.

Field Training

There are three types of field training: a four-week course for cadets in the Four-Year Program; a six-week course for Two-Year Program applicants; and a special five-week course for pilot candidates. Students in any of these programs normally attend field training between their sophomore and junior years. Field training is hosted each summer by several active Air Force installations.

Field training is designed to stimulate the development of military leadership and skills among students through meaningful experiences. This is accomplished through the field training curriculum and associated activities. The curriculum consists of aircraft, aircrew, and survival orientation; junior officer training; physical training; small arms training; a social-action program; and supplemental training. Special emphasis is placed on career orientation and interaction with young officers in fields of interest to the student. The six-week field training program differs in that it has additional sixty hours of academic course work similar to the sixty hours of course work taken by the Four-Year Program cadets during their freshman and sophomore years.
The five-week pilot program includes, in addition to the four-week curriculum, a flight instruction program consisting of ground school and 13½ hours of flying training in a light aircraft. Ground school provides a basic understanding of aircraft systems, aerodynamics, flight instruments, air navigation (including radio navigation), meteorology, weather services, the national airspace system, federal aviation regulations, medical factors affecting flight, flight preparation, airport operations, and pre-flight and takeoff procedures. Upon completion of this flight-training program, a cadet may continue training, at his or her own expense, for a private pilot’s license through the Federal Aviation Administration.

In addition to flight training, airborne parachute jumping instruction is an extracurricular activity to selected volunteer cadets.

Advanced Training Program (ATP)

This program allows selected cadets to go to active-duty Air Force bases for a two- or three-week period during the summer following their junior year. As “third lieutenants,” cadets receive specialized career orientation and an opportunity to experience leadership, human relations, and management challenges encountered by Air Force junior officers. Cadets also have an opportunity to become familiar with the Air Force way of life. Cadets receive pay and allowances authorized by current directives at the time of advanced training attendance.

Commissioning

All students who successfully complete the AFROTC advanced program (POC) and who are awarded a baccalaureate degree are commissioned as second lieutenants in the Air Force Reserve.

Air Force Careers

Air Force policy has been to assign new officers to a career field appropriate to their educational background. Students in the engineering-scientific category may be assigned to practice in their specialty in research and development, communications, aeronautics, astronautics, design and development, the biological sciences, computer design and maintenance, meteorology, or various other engineering and scientific fields. They will work under the supervision of some of the most highly qualified people in their field and gain access to the latest scientific facilities and equipment. Any undergraduate major is suitable for those who are interested and qualified to be pilots or navigators. After completion of flying training they are assigned primary duties flying various kinds of aircraft.

Officers who elect missile duty will be sent to school for training in that field. Upon completion of school they will be assigned to one of the operational missile bases as a crew member. This type of assignment provides an opportunity to become familiar with the Air Force way of life. Missiles are assigned to one of the operational missile bases as a crew member. This type of assignment provides an opportunity to become familiar with the Air Force way of life. Cadets receive pay and allowances authorized by current directives at the time of advanced training attendance.

Curriculum

Students in the Four-Year Program are required to take all the courses listed below. Students in the Two-Year Program are required to take all of the courses listed for the junior and senior years.

Freshman Year

Air S 161 United States Military Forces Fall 1 credit.

One class each week. M. E. Miekle.

A study of current United States military forces with emphasis on the analysis of the doctrine and mission of the United States Air Force. Army and Navy operations, as contributions to the total national defense, are reviewed. Current factors affecting today’s professional military officers are considered.

Air S 162 Aerospace Operations Spring 1 credit.

One class each week plus a field trip to a local military installation. M. E. Miekle.

The aerospace forces of the United States are studied with emphasis on the organization and resources of the United States Air Force. The elements of strategic offensive and defensive general-purpose and aerospace support forces throughout the world are studied.

Sophomore Year

Air S 211 Development of Military Aviation Fall 1 credit.

One class each week. C. R. Andrews.

Factors leading to the development of aviation, and the concepts and doctrine for the employment of air power are studied. Topics to be reviewed and analyzed include the history of manned flight, the effects of World War I on the uses of aviation, and the development of pre-World War II aircraft and the political struggles for an independent United States air arm. The role of air power in World War II, including strategic bombing, tactical air power, and the role of air superiority in warfare, is examined.

Air S 212 American Air Power since 1947 Spring 1 credit.

One class each week. C. R. Andrews.

The employment of the Air Force since World War II in military and nonmilitary operations to support national objectives. Effects of technology on defense policy and strategy are reviewed. The part played by the air arm in activities such as the Berlin airlift and international relief missions is discussed. The role of air power in World War II, including strategic bombing, tactical air power, and the role of air superiority in warfare, is examined.

Air S 331 Leadership and Communicative Skills Fall 3 credits.

Two or three classes each week. P. D. Decker.

Leadership responsibilities at the junior officer level, including the responsibility authority, and functions of a military commander and his staff, emphasize leadership research and theory. Recent approaches to leadership models and the importance of communication skills in any leadership role are considered. Case-study exercises and oral and written assignments are required.

Air S 332 Management in the Armed Forces Spring 3 credits.

Two or three classes each week. P. D. Decker.

Management at the junior officer level. Basic concepts of management and the decision-making process, including planning, organizing, coordinating, directing, and controlling. Evaluation processes and techniques used by management are studied. Position of management in the organization, including managerial strategy and tactics, is considered. Case studies and oral and written assignments are required.

Senior Year

Air S 461 Armed Conflict and Society Fall 3 credits. H. L. Reem.

Three classes each week. Presentations by military instructors with government and history departments.

A study of modern warfare that examines the relationship of military strategy to geography, economics, sociology, technology, and national political realities and values; the evolution of warfare, including principles of war, weapons, and associated equipment; and the effects of nuclear weapons and guerrilla warfare on traditional concepts of national strategy.

Air S 462 National Security Forces in Contemporary American Society I Fall 3 credits.

Two or three classes each week. H. L. Reem.

The functions and roles of the professional officer in a democratic society and how they relate to the socialization processes, prevailing public attitudes, and value orientations associated with professional military service are examined. Changes within the military are analyzed, including such topics as the all-volunteer service, race relations, and the impact of women in the armed forces. The essential features of the military justice system as it functions to protect basic human rights and organizational order are reviewed. The formation and implementation of defense policy, including political, economic, and social constraints, is studied.

Leadership Laboratory Courses

All Air Force cadets spend at least one and one-half hours a week throughout the academic year in a leadership laboratory, for which no academic credit is given. Occasionally laboratories are held at times other than the normally scheduled period (such as the fall Veterans Day parade and the spring Military Awards Ceremony). All cadets are also expected to participate in an evening dining-in. Cadets are required to meet minimum physical fitness and weight standards once a semester.

Air S 141–144 Initial Military Experiences

Introduction to the responsibilities, life, and work of an Air Force officer. Basic knowledge of drill and ceremonies, military courtesies, and the wearing of the uniform. Field trip to a local military installation.

Air S 241–242 Intermediate Military Experiences

Develops skills in giving commands for drill and ceremonies. Introduction to Air Force base environment in which the Air Force officer functions. Includes a look at various venues available based on academic majors. Students experience and participate in leadership situations through military drills and ceremonies. Field trip to local military installation.

Air S 341–342 Junior Officer Leadership

Cadets assume leadership responsibilities similar to those of a junior officer. Emphasis is on comprehending the importance of applying effective human relations in dealing with superiors, peers, and subordinates. Relationship between Air Force Specialty Codes and academic majors. The importance of basic health habits to leadership.

Air S 441 Advanced Leadership Experiences

Command leadership in operating a military organization. Cadets apply effective leadership and managerial techniques with individuals and groups and participate in self-analysis of leadership and managerial abilities.

Air S 442 Prescommissing Laboratory

Factors that facilitate transition from civilian to military life are reviewed. The need for military security, base services and activities, personal finances, travel regulations, and social obligations are introduced.
Department of Physical Education and Athletics

The Program

Cornell is proud of its diversified physical education program—unique in its concept and tradition of excellence—that encompasses over seventy recreational activities, ranging from the aquatic depths of synchronized swimming to the heights of mountain climbing. It ranks among the five largest university programs in the nation.

Teaching emphasis in the program is placed on recreational activities that can be continued outside the University. Each member of the instructional staff has extensive experience and skill in the area he or she teaches, and all of the abundant facilities available to the athletics department are used as needed in the program.

This catalog serves only as a guide. Dates, fees, and regulations stated herein are subject to change at any time. Please see the information sheet available at the physical education office in Teagle Hall.

Physical Education Requirements

All undergraduate students admitted to Cornell as freshmen must complete two terms of physical education—normally during the first two terms of attendance.

In addition, the University Faculty Committee on Physical Education has established a basic swimming qualification requirement for all entering freshman students. Normally women take the test in the Helen Newman pool, and men in the Teagle pool. As part of their physical education registration process, the test consists of a continuous seventy-five-yard swim using front, back, and optional strokes and is conducted during the first week of academic classes. All others who have to qualify should contact the physical education office in Teagle Hall (men) or Helen Newman Hall (women) to make an appointment for the swim test. Any student who swam the test is required to include swimming in his or her program of physical education before electives can be chosen. Students will receive a grade of Incomplete in physical education until they have passed the swim test.

Circumstances permitting exemption from, or postponement of, these requirements are outlined in the section on waiver of requirements.

Transfer Students

Students who transfer to Cornell from another college or university will be given credit for one term of physical education for each full term of academic transfer credit they are granted by Cornell. Any transfer student entering Cornell as a sophomore or higher normally is not required to take physical education classes for credit. Each student should clarify his or her transfer status with the appropriate college office. Transfer students subject to the credit requirement must take the swim test before signing up for an elective.

Waiver of Requirements

A waiver or postponement of physical education requirements may be granted if the student:

1. has a physical handicap or medical affliction, certified by University medical staff, that precludes participation in any physical education activity (the department is prepared to adapt a physical education program to the individual needs of a handicapped student whenever possible); or
2. is committed to twenty hours or more of employment per week (the director of scholarship and financial aid must issue the request for exemption, certifying the necessity for such employment obligations).

Permission for postponement of, or exemption from, the physical education requirements is issued only by the University Faculty Committee on Physical Education or the director of physical education. Final authority for interpreting and ruling on requests for exemption rests with the committee.

Course Registration

Registration for credit for all physical education classes (for men and women) takes place in Teagle Hall gymnasium during the academic course registration period. Dates and times are publicized with other registration information each semester.

All classes for those in the required program are filled on a first-come-first-served basis. A $25 penalty fee is charged by the department for late enrollment occurring immediately after the University's posted registration periods.

Physical education courses may be dropped or added without penalty during the first three weeks of the semester; this must be done at the physical education office in Teagle Hall. Please be alerted to specific courses that list add-drop periods other than the first three weeks. In general, such changes will be allowed only if the student has a conflict caused by a change in his or her academic schedule. Each student may make only one course change per term.

The physical education department assesses a $10 penalty fee for a course change made after the three-week drop-add period.

Registration Procedure

After picking up their general registration materials in Barton Hall, students enter the west end of Teagle Hall (across Garden Avenue from Barton Hall). Signs in the hall give directions to the gym, which is upstairs. In the gym, students:

1. sign up for a swim test (men sign at the Teagle table; women at the Helen Newman table; nonswimmers do not sign up for a swim test—they go directly to the card files);
2. after obtaining an appointment for a swim test, go to the card file in the center of the gym and receive their permanent yellow record card;
3. hand carry the permanent card to the course table of their choice (when signing up for a course, students should make sure they understand when and where the class will meet, and any fee policy connected with the course);
4. leave the yellow card on the sign-up table after the coach has filled it out.

During spring-term registration, students follow steps two through four above. Students who need to take the swim test during the spring term must arrange an appointment through the physical education office in Teagle Hall.

Credit

Physical education credit is granted for:

1. satisfactory completion of a course offered through the physical education program; participation on an intercollegiate team as a competitor or manager; participation in the marching band (full term only); satisfactory completion of a physical education course at a recognized institution provided that (a) a written request to enroll is submitted to, and approved by, the director of physical education at Cornell and (b) a transcript of the in absentia credit is forwarded to the physical education office at Cornell.

Students receive credit for only one course per term. If a student enrolls in more than one course per term, credit will be given only for the first course the student has enrolled in, as recorded in the physical education office. A grade of Incomplete received in a physical education course taken for credit must be made up before the end of the following term.

Absences

Students enrolled for credit are allowed three absences without penalty in each twelve-week course. Proportional adjustments will be established by the instructor for courses meeting for more than forty-five minutes at each session or that meet over a period of less than twelve weeks.

Each absence due to illness or medical problems is granted without penalty in each twelve-week course. Each absence due to illness or medical problems that is in excess of the three absences allowed without penalty must be made up. All medical problems and illnesses that cause absence from classes must be reported to the Gannett Health Center at the time of occurrence. A maximum of eight illness-related absences will be allowed per term before a medical postponement is imposed.

Students enrolled for credit in the Greek Peak ski program will be permitted to make up only one absence; five absences are required to receive credit for the program. The allowable absence must have been made up by the program's ending date.

Elective Enrollment

Elective (no-credit) enrollment is allowed, and encouraged. A maximum of five absences is allowed per twenty-four class sessions (a proportional adjustment is made for courses meeting less often). Penalty for noncompliance is a $10 fee.

Faculty, staff, their spouses, and college-age dependents are welcome to participate in the physical education program whenever class space is available. A general registration fee of $50 is charged in addition to any specific course fees.
These fees are to be paid by cash or check at the time of course registration.

Facilities

Teagle Hall, at the corner of Garden Avenue and Schoellkopf Drive, is the administrative headquarters for the physical education and athletics program. Department offices (telephone: 255-4286) are in the west end of the building. Teagle contains two swimming pools, crew practice tanks, a wrestling room, weight-lifting rooms, an open gym floor, and a steam room.

Classes in gymnastics, judo, karate, scuba diving, swimming and water safety, weight lifting, and yoga are held here.

Helen Newman Hall, is situated at the end of South Balch Drive (telephone: 255-5133). The building contains a swimming pool, dance studios, sixteen bowling alleys, a large open gym floor, and a sauna room. Classes in aerobics, archery, badminton, bowling, dance, fencing, physical conditioning, swimming, tennis, and volleyball are held here.

Barton Hall, situated on Garden Avenue opposite Teagle Hall, contains a large open gym floor. Classes in badminton, basketball, hunter safety, jogging, physical fitness, riflery, volleyball, and mountaineering are held here.

Lynah Rink is used for classes in figure skating, hockey, and ice skating, as well as for public skating sessions during scheduled hours from late October until mid-March.

Schoellkopf Hall is used for Nautilus and weight-lifting exercises and first-aid and CPR instruction. Classes in racquetball and squash are held in the Grummun Squash Courts.

Other facilities used in the program include the Oxiey Polo Arena for polo and riding instruction; Moakley golf course for instructional and recreational golf; the Kite Hill indoor tennis bubble, the Tompkins County Rod and Gun Club for skeet and trapshooting; and Greek Peak, Virgil, New York, for skiing.

Schedules for use of all athletics facilities can be obtained from the Teagle Hall and Helen Newman Hall main offices.

Use of Facilities and Equipment

In the event conflict arises between the use of department equipment or facilities, physical education classes have priority. The director or assistant director of physical education will assign priorities when necessary. The Department of Physical Education and Athletics is not responsible for any personal items left in any of its buildings or facilities.

Equipment Issued to Students

All students taking classes for credit are entitled to use of a basket and a combination lock and a soap user’s card. Baskets for men and women are available in Teagle Hall and are assigned to new students during academic registration. There are baskets for women only in the main locker room in Helen Newman Hall; assignment procedures are the same as for Teagle.

Baskets are issued on a first-come–first-served basis, beginning during academic registration week. Each student may receive a towel when he or she attends class. There is no charge for the basket, lock, or towel provided they are returned to the department at the appropriate time. If any of these articles is lost, the replacement cost will be charged to the student’s bursar account.

Each student will provide his or her own appropriate gym uniform (socks, shorts, T-shirt, sneakers, etc.) for class when needed. Students can rent a solid-color gym uniform for use during the term from the locker-room staff in Teagle Hall.

Students are allowed to borrow small equipment items, such as basketballs, volleyball, skis, ropes, punching-bag gloves, or horseshoes, from their locker-room equipment areas for short-term use. The student’s identification card will be held by the department as security while the item is in use.

Equipment Issued to Groups

Established campus groups may borrow certain sports equipment (e.g., volleyballs and nets but not poles; softballs and softball bases and bats) from Helen Newman and Teagle halls for up to twenty-four hours during the early fall or late spring. A deposit is required.

Faculty-Staff Use of Facilities

Faculty and staff become eligible to use Teagle Hall and Helen Newman Hall facilities by paying a yearly membership fee. Members are issued a basket and lock (at the issuing hall only) and are provided with a gym uniform and towel on a daily basis. Faculty and staff may participate in any physical education class on a space-available basis; all related fees must first be paid (see “Selective Enrollment,” above).

Use of Swimming Facilities

All students may use the swimming facilities in Teagle Hall or Helen Newman Hall between classes, during the noon hour, and at established hours during the evening and on weekends. Faculty and staff who have Teagle Hall seasonal memberships may use the Teagle pools during these periods also. Faculty and staff who do not have seasonal membership may use the Helen Newman pool (by paying an hourly fee) or the Teagle pools during designated hours. Specific times are established each term for coed swimming and for family swim nights. Schedules for the use of the pools are available in the main offices of Teagle and Helen Newman halls.

Women using the Teagle pools must supply their own swimsuits (caps are not required); they may change and shower in the locker rooms at the west end of the building, facing Barton Hall. Towels are provided. Teagle Hall does not provide hair dryers, but electrical outlets are available for use of personal dryers in the locker rooms. Swimmers using the Helen Newman pool must provide their own swimsuits.

All persons using swimming facilities are required to take a thorough shower immediately before entering the pool and to obey the orders of the lifeguards at all times. Swimming is allowed only when a lifeguard is on duty.

Courses

The courses and fees described in this catalog are subject to change or cancellation at any time by official action of Cornell University.

Enrollment in any course is limited by the space available. Other restrictions are included in the course description. All courses are coeducational.

The specific time and place of class meetings, as well as information about fees, are available at physical education course registration. Course fees are billed through the Office of the Bursar.

Additional course offerings may be listed at registration, since the curriculum is frequently reviewed and changed.

Badminton

Fall and spring

Two classes a week, Helen Newman Hall and Barton Hall.

Fundamental shots, scoring, and general play.

Basketball

Fall and spring

Two classes a week, Barton Hall.

Fundamental drills in passing, shooting, and dribbling. scrimmage each class session.

Bowling

Fall and spring. Fee charged.

Two classes a week, Helen Newman Hall.

For the beginning and intermediate bowler. Shoe rental is included in the fee.

Equitation

Fall and spring. Fee charged.

One class a week, Oxiey Polo Arena. Class days and hours are arranged at registration. Instruction varies according to riding ability and experience.

Fitness and Conditioning

Fall and spring.

Two classes a week, Helen Newman Hall and Barton Hall.

Physical fitness program that embodies features of stretching exercises, weight lifting, and jogging. Students work on their individual training needs.

Fundamentals of Flying Disc Sports

Fall and spring.

Two classes a week, Barton Hall.

Several types of throws and catches are covered, as are the fundamemtals of various disc sports, including Ultimate Frisbee and disc golf. Designed primarily for beginners.

Judo

Fall and spring. Fee charged.

Two classes a week, Teagle Hall.

Conditions and increases suppleness. Develops skills in the two parts of judo: standing techniques (throws and trips) and mat techniques.

Lacrosse

Fall.

Two classes a week, Schoellkopf Field.

Instruction and practice in basic skills (cradling, passing, catching, goal shooting, checking) and team play.

Nautilus

Fall and spring. Enrollment limited to capacity of facilities. Fee charged.

Two classes a week, Schoellkopf Hall.

Advanced weight lifting on specifically designed apparatus. There are ten stations in the room.

Racket Games

Fall and spring.

Racquetball, squash, badminton, and deck tennis. Playing fundamentals, scoring, and rules are stressed. Interclass competition.

Racquetball

Fall and spring. Fee charged.

Two classes a week, Grummun Squash Courts.

Instruction at all levels. Equipment is furnished.

Slimnastics

Fall and spring.

Two classes a week, Helen Newman Hall.

Ways in which exercises may be used in weight control, the role of nutrition and diet in weight control, and the design of an individual exercise and running program.

Soccer

Spring.

Two classes a week, Schoellkopf Field.

Introduction to the game. Includes basic individual skills (passing, trapping, volleying) and team play and strategy.

Squash

Fall and spring. Fee charged.

Two classes a week, Grummun Squash Courts.

Classes for all levels of play. Equipment is furnished.

Weight Training

Fall and spring.

Two classes a week, Teagle Hall.

Classes include instruction in correct lifting techniques involving all muscle groups. Recreational classes are established for experienced lifters; structured classes are for novices.

Aquatic Courses

Beginning Swimming

Fall and spring.

Two classes a week, Helen Newman Hall and Teagle Hall.

Instruction and practice in basic skills leading to passing the basic swimming proficiency test.
Advanced Beginning Swimming  Fall and spring.  Two classes a week. Helen Newman Hall and Teagle Hall.  This course is ideal for all who have taken one term of Beginning Swimming, regardless of whether the swimming test was successfully completed. Areas of special emphasis are the crawl stroke and rotary breathing, back crawl, sidestroke, breaststroke, diving, treading water, and underwater swimming. The primary objective of this course is to strengthen the student's confidence and competence.

Intermediate Swimming  Fall and spring.  Two classes a week. Helen Newman Hall and Teagle Hall.  Practice and perfection of basic skills and five basic strokes.

Advanced Swimming  Fall and spring.  Two classes a week. Helen Newman Hall and Teagle Hall.  Practice and perfection of the eleven basic strokes.

Diving  Fall and spring.  Two classes a week. Teagle Hall.  Instruction in all the basic dives, including front (pike and layout), back, and front and back somersault.

Advanced Lifesaving  Fall and spring.  Two classes a week. Helen Newman Hall and Teagle Hall.  American Red Cross senior lifesaving course. Practice and execution of survival and lifesaving skills. Certification is awarded on satisfactory completion of the course.

American Red Cross Water Safety Instructor Certification  Fall and spring.  Prerequisite: American Red Cross advanced lifesaving certification.  Three or five classes a week. Helen Newman Hall and Teagle Hall.  Students must not miss first class.  American Red Cross water safety instructor certification is awarded on satisfactory completion of the course.

Water Safety Instructor Refresher Course  Spring.  Five classes a week. Teagle Hall.  Selected sessions of the basic water safety instructor certification course.

Lifeguard Training  Spring.  Prerequisites: American Red Cross advanced lifesaving certification, first aid, and CPR.  Two classes a week. Teagle Hall.  This advanced-level course's primary focus is on the techniques, philosophies, legal considerations, and different methods of supervision required for competent lifeguarding.

Scuba Diving  Fall and spring. Fee charged.  Teagle Hall.  Program includes skill training in a pool and open-water training in Cayuga Lake. P.A.D.I. certification awarded upon successful completion.

Advanced Open-Water Scuba Diving  Fall and spring. Fee charged.  Advanced-level open-water training in Cayuga Lake. For those who have completed the basic course.

Rescue Diver  Fall and spring. Fee charged.  Advanced course for scuba divers. For those who have completed Advanced Open Water Scuba Diving.

Dive Master  Fall and spring. Fee charged.  Hours to be arranged. Teagle Hall.  Advanced-level scuba course open only to those who have completed the rescue diver course.

Bahamas Scuba Diving  Fall and spring. Fee charged.  This course is offered during intersession periods. One week of sailing and diving in the Bahamas. See the information sheet at the registration table.

Beginning Synchronized Swimming  Fall.  Two-hour class one evening a week. Helen Newman Hall.  Sculling stunts, including the tub, marlin, log roll, front and back tuck somersaults, and front and back pikes.

Advanced Synchronized Swimming  Spring.  Two-hour class one evening a week. Helen Newman Hall.  Preparing, practicing for, and presenting an aquatic show.

Aquatic Conditioning  Fall and spring. Prerequisite: good swimming ability.  Two classes a week. Teagle Hall.  Introduction to, and practice of, different training methods. Final objective: to swim 2,500 yards during class period.

Inner-Tube Water Polo  Fall and spring.  Two classes a week. Teagle Hall.  Ball handling, shooting, passing, basic offensive and defensive strategy. Scrimmaging while afloat on inner tubes.

Board Sailing (Wind Surfing)  Fall. Fee charged.  Ten instructional lessons plus free practice times.  The equipment is furnished. A Mistral Board Sailing Academy certificate is awarded on successful completion of the course.

Water Skiing  Fall. Fee charged.  Three classes a week. Introductory course for beginning water skiers. Conducted on the east shore of Cayuga Lake. Students must provide their own transportation to and from the lake.

Archery  Fall and spring.  Basic Archery  Two classes a week. Helen Newman Hall.  Instruction in the care of equipment; seven basic steps for shooting; scoring; practice shooting at twenty, thirty, and forty yards.

Dance  Fall and spring.  Ballroom Dancing  Two classes a week. Helen Newman Hall.  Includes instruction in the Waltz, Charleston, tango, and rumba.  A program to meet the needs of each participant.  Increases capacity from jogging a few hundred yards to three miles at the end of twelve weeks.

Jogging  Fall and spring.  Two classes a week. Barton Hall and track.  A program to meet the needs of each participant. Increases capacity from jogging a few hundred yards to three miles at the end of twelve weeks.

Intermediate Modern Dance  High-Intermediate Modern Dance  Advanced Modern Dance  Tap Dance

Fencing  Fall and spring. Fee charged.  Two classes a week. Helen Newman Hall.  Includes warm-up exercises and all basic offensive and defensive moves. Equipment is furnished.

First Aid  Standard First Aid  Fall and spring. Textbook fee charged.  One or two classes a week. Schoellkopf Hall.  American Red Cross standard first-aid course. Certification is awarded on satisfactory completion of the course.

Advanced First Aid  Fall and spring. Fee charged.  American Red Cross CPR certification is awarded on satisfactory completion of the course.

Cardiopulmonary Resuscitation (CPR)  Fall and spring. No credit. Fee charged.  American Red Cross CPR certification is issued on satisfactory completion of the course.

Intermediate Modern Dance  High-Intermediate Modern Dance  Advanced Modern Dance  Tap Dance

Fencing  Fall and spring. Fee charged.  Two classes a week. Helen Newman Hall.  Includes warm-up exercises and all basic offensive and defensive moves. Equipment is furnished.

Fencing II  Fall and spring. Fee charged. Prerequisite: Fencing I or equivalent.  Two classes a week. Helen Newman Hall.  Interclass competition is stressed. Equipment is furnished.

Archery  Fall and spring.  Basic Archery  Two classes a week. Helen Newman Hall.  Instruction in the care of equipment; seven basic steps for shooting; scoring; practice shooting at twenty, thirty, and forty yards.

Dance  Fall and spring.  Ballroom Dancing  Two classes a week. Helen Newman Hall.  Includes instruction in the Waltz, Charleston, tango, and rumba.  A program to meet the needs of each participant.  Increases capacity from jogging a few hundred yards to three miles at the end of twelve weeks.

Jogging  Fall and spring.  Two classes a week. Barton Hall and track.  A program to meet the needs of each participant. Increases capacity from jogging a few hundred yards to three miles at the end of twelve weeks.

Jogging Tours  Fall. Three classes a week for seven weeks. Barton Hall.  Each class consists of a three-to-five-mile jogging tour of a local area.
Karate Shito Ryu

Basic Karate Fall and spring. Fee charged.
Two evening classes a week, Teagle Hall.
A beginning course taught by professional staff.

Advanced Karate Fall and spring. Fee charged.
Two evening classes a week, Teagle Hall.
Open to those who have taken Basic Karate or the equivalent.

Outdoor Programs

Backpacking in the Finger Lakes Region Fall and spring. Fee charged.
Hours to be arranged, Teagle Hall.
Class sessions lead to a full weekend on the trail in a local wilderness area.

Natural History—Backpacking
For those interested in learning about the ecology of the Finger Lakes region while hiking and camping in the field. A scientific background is not necessary, though a desire to learn about nature is. Also includes curriculum similar to the backpacking course. Classes and outings finish with a weekend trip.

Wilderness Living Skills
Designed for graduates of the Outdoor Program camping courses or for those with equivalent experience. Will include a weeklong wilderness expedition during spring break. Includes in-depth development of wilderness living skills, effective group dynamics, and environmental awareness.

Basic Rock-climbing Skills M Ro F 1:30–5. Students must attend a total of nine classes.
Instruction and practical experience in the technical aspects of mountain climbing. No experience required. Includes rock climbing, knots, rope handling, belaying, rappelling, and ropes.

Instructor Development Program Approval required.
An advanced training program for those interested in becoming Outdoor Program instructors. Includes workshops on teaching and leadership skills. Each student works directly with an adviser to design and implement an individualized program for outdoor skills and instructor skills development. Academic credit may be arranged.

Technical Ice-climbing Prerequisite: Basic Mountaineering, Basic Rock-climbing, or equivalent. Instructions in techniques for safe climbing on steep snow and ice. January-February climbing in local gorges includes use of crampons, ice axes and hammers, ropes, ice screws, and related equipment.

Shawangunks Rock-climbing Expedition For graduates of Basic Rock-climbing or Basic Mountaineering, or with equivalent experience. A four-day trip to the Shawangunks rock-climbing area in October or May with experienced leadclimbing instructors. Includes multipitch climbs. Meetings prior to trip.

Wyoming Mountaineering Expedition This course requires commitment for the month of June. Includes twenty days of continuous wilderness travel and mountaineering in the remote Wind River Mountains of Wyoming. A thorough wilderness skills and mountaineering curriculum will be covered similar to that of the National Outdoor Leadership School. Instructors will be certified by NOLS.

Bicycle Touring—Camping
Designed for the beginning to intermediate cyclist. Includes instruction and practical experience in riding technique, maintenance, repair, bicycle packing, and camping skills. Local rides and sessions will lead to one or more overnight camping tours in the Finger Lakes area.

Canoe Expeditioning
For the beginning or intermediate canoeist. Includes strokes and paddle techniques, canoe packing, navigation, logistics, and camping skills. Local outings culminate in a canoe expedition in the Adirondacks.

White-Water Canoeing Prerequisite: Flat-water canoe experience.
For those interested in navigating fast water. Instruction and practical experience in white-water strokes and techniques, reading current, water safety, and river-running logistics.

White-Water Kayaking (Beginner) Spring
Designed for individuals with some kayaking or canoeing experience. Instruction covers kayak strokes and maneuvering techniques, reading currents, equipment, water safety, and river-running logistics. Includes three days of river trips.

Winter Break Ski Touring Expedition Fee charged.
Limited to experienced outdoor people. Seven-day trip to the Adirondacks.

Relaxation and Stress Management Fall and spring.
Two classes a week. Helen Newman Hall
Introduction to basic relaxation techniques for the reduction of everyday stress. Techniques will be taught that can be used in normal everyday living situations.

Riffery
Riffery: Fall and spring. Fee charged.
Two classes a week. Barton Hall
Instruction and practice in the techniques of target riffery from various shooting positions.

Intermediate Riffery Fall and spring. Fee charged.
Hours to be arranged, Barton Hall.
Advanced course for those who have had experience in target shooting.

Skeet and Trapshooting Fall and spring. Fee charged.
Two-hour class one afternoon a week, Teagle Hall.
Instructor in hunter safety leads to New York State certification for bow and gun.

Hunter Safety Fall and spring.
Instruction in hunter safety techniques. Includes lectures and shooting at the Tompkins County Rod and Gun Club range. Guns and shells are furnished.

Hunter Certification Fall and spring.
Students provide their own figure skates or rent them at Lynah Rink.

Introduction to Ice Hockey Fall and spring. Fee charged.
Prerequisite: Beginning hockey or participation in organized hockey.
Two classes a week. Lynah Rink.
This course is designed for the intermediate hockey player. Advanced techniques taught include: positioning, power play, penalty killing, offensive and defensive attack. Each session will be emphasize game situations and scrimmaging. Skates and hockey sticks must be supplied by the participants. All other necessary equipment will be supplied by the Physical Education Department.

Skiing

Skiing Conditioning Fall.
Two classes a week, Helen Newman Hall.
Exercises designed to increase flexibility, strength, and endurance in preparation for the ski season.

Downhill Skiing Spring. Fee charged.
One class a week, Greek Peak.
Transportation, instruction, ski-lift fees, and skiing time are offered in a package deal. Greek Peak personnel are present at registration to explain the program and accept fees. Bus transportation to Greek Peak is provided six afternoons a week for six weeks.

Cross-Country Skiing Spring. Fee charged.
Six 3½ hour classes. Meets once a week.
Transportation provided to a ski touring center.

Cross-Country Skiing Spring. Fee charged.
Two-hour class one afternoon a week, Helen Newman Hall.
Classes designed for all levels. Covers waxing and choosing equipment.

'T'ai Chi Chuan

'T'ai Chi Chuan I and II Fall and spring.
Two classes a week, Teagle Hall.
Introduction to T'ai Chi, a system of graceful, slow-movement exercises that aim at nurturing relaxation, deep breathing, and improved circulation.

Kung Fu Fall and spring.
Three classes a week, Teagle Hall.
Exploration of conditioning and fitness procedures used in the major martial arts, such as karate or judo. Covers circular movement for generating strong blocks, kicks, and punches.

Self-Defense for Women Fall and spring. Fee charged.
Hours to be arranged, Teagle Hall.
Basic methods of physical protection for women.

Martial Arts and Aerobic Exercises Fall and spring.
Three classes a week, Teagle Hall.
Blend of ten basic martial-art techniques in a framework of rhythmic exercises.
Tennis

**Indoor Tennis**  Spring. Fee charged.
Two classes a week, Kite Hill tennis bubble.
Classes for all levels of play. Emphasizes strategy for intermediate and advanced groups. Space limitation requires doubles play.

**Beginning Outdoor Tennis**  Fall.
Three classes a week for half a term, Helen Newman courts.
Instruction and practice in basic strokes (forehand, backhand, serve).

**Intermediate Outdoor Tennis**  Fall.
Three classes a week for half a term, Kite Hill courts.
Use of fundamental strokes, lobs, and drop shots; doubles strategy.

**Advanced Outdoor Tennis**  Fall. Limited to experienced players.
Three classes a week for half a term, Kite Hill courts.
Emphasizes strategy.

Volleyball

**Introduction to Volleyball**  Fall and spring.
Two classes a week, Barton Hall.
Fundamentals of ball handling, serves, defensive blocks, and position play are stressed. Classes will scrimmage.

**Intermediate Volleyball**  Fall and spring.
Two classes a week, Helen Newman Hall and Teagle Hall.
Passing and blocking strategy; scrimmages in class.

**Advanced Volleyball**  Fall and spring.
Two classes a week, Helen Newman Hall.
Offensive and defensive team strategy is emphasized in class scrimmages.

Yoga

**Yoga I**  Spring. Fee charged.
Two classes a week, Teagle Hall.
Fundamentals of hatha-yoga. Covers basic postures, breathing techniques, and deep relaxation. Introduces chanting.

**Yoga II**  Spring. Fee charged.
Two classes a week, Teagle Hall.
Designed for those who have completed Yoga I or its equivalent.
Division of Summer Session, Extramural Study, and Related Programs

Administration

Robert D. MacDougall, dean
Charles W. Jermy, Jr., associate dean
Joanne E. Davenport, director, Cornell University Conference Services
Judith K. Eger, director, Programs in Professional Education
Mary K. Gloster, assistant to the dean
Margaret L. Haine, director, Cornell University Summer College
Ralph Janis, director, Cornell's Adult University
Valerie A. Sellers, registrar
Wanda Terry, manager, media services
Marjorie S. VanNess, business manager

The Division

The Division of Summer Session, Extramural Study, and Related Programs provides a wide variety of educational opportunities beyond the degree-granting programs of the University. These programs serve virtually all age groups in a great variety of formats and time frames.

Summer Session

The Cornell University Summer Session provides unique and unusually attractive opportunities for study and recreation at a time when the Cornell campus and the Finger Lakes region of central New York are at their loveliest and the Ithaca weather is at its best. Students of all ages—high school juniors, senior citizens, and everyone in between—may choose from a wide spectrum of courses scheduled during three-, six-, and eight-week sessions, as well as from dozens of special programs of varied lengths. Admission is relatively open and simple. Classes meet daily and are usually kept small to foster a close association between students and teachers. For more information, interested persons should consult the Summer Session Office, B12 Ives Hall, or call 255-4987.

Extramural Study

The extensive credit-course offerings of the University are available to area residents on a part-time basis. Those interested may apply for admission to practically any course in the University and will be admitted if they receive the instructor's written approval. The division also offers an Official Visitor's Program that allows persons to attend classes in many divisions of the University on a space-available basis at a reduced charge. Visitors are required to obtain written permission of the instructor. In this program no credit is given and no record is kept of attendance or performance. During the January intersession period the division offers credit courses primarily for undergraduates but open to anyone. For further information, students should contact the Extramural Office in B12 Ives Hall or call 255-4987.

Programs in Professional Education

Because of Cornell's leadership both in theoretical and applied research, the University offers unique opportunities for professional growth and refreshment to persons in science, technology, government, business, and industry. The division's Programs in Professional Education present intensive updates on specific issues, ideas, and technological advances, involving faculty members whose teaching and research at Cornell center around current and anticipated developments in areas of importance to the corporate sector and the professions. Programs in Professional Education can also respond to the needs and interests of corporate groups or professional societies, developing programs both on and off campus that are suited to their particular educational purposes. For more information, interested persons should telephone 255-7259.

Cornell's Adult University

Cornell's Adult University (CAU) offers one-week noncredit academic courses on campus during the summer and weekend seminars at off-campus locations during the fall and spring. Originally conceived as a program for alumni, CAU has greatly broadened its mission in the area of adult education. All courses and seminars are inspired by the belief that learning never ends and that one of the roles of a great university is to provide a bridge between traditional, formal education and informal, noncredit study. For more information, interested persons should consult Cornell's Adult University, 626B Thurston Avenue, or call 255-6260.

Conference Services

Excellent facilities, a beautiful campus, and a conference office concerned with each group's special needs make Cornell an ideal setting for conferences and meetings. Professional groups from all over the country come to Cornell to take advantage of this special learning environment. The staff is available to answer questions, advise on creative program ideas, assist in planning, make special arrangements, secure accommodations, and handle other administrative details. Every effort is made to ensure the success of each conference.

For more information about conferences at Cornell, interested persons may consult Cornell University Conference Services, Box 3, Robert Purcell Union, or call 255-6290.

Continuing Education Information Service

The Continuing Education Information Service provides free information, counseling, and referral to men and women who have been out of school for several years and want to resume their education. Anyone who wants to take courses, begin an undergraduate or graduate degree program, or complete an unfinished degree is welcome to use the services of the center.

The center provides information on all schools and departments of the University: opportunities for part-time and full-time study; special courses, workshops, and seminars; and community resources available to older students. A small library includes information on continuing-education research, adult learning and development, educational opportunities at local institutions of higher learning, financial aid, work-study programs, and admission procedures. For further information, interested persons should contact Continuing Education Information Service, B12 Ives Hall, or call 255-4987.

Summer Courses

The Cornell University Summer Session always offers a wide variety of courses. Among these are a number of courses that are usually offered every summer. The list that follows includes those courses that are likely to be offered during the summer of 1987. The list is not exhaustive; many additional courses that are offered only occasionally or for the first time are not listed. For further information, students should contact the Summer Session Office, B12 Ives Hall, or call 255-4987. The 1987 Announcement of Summer Session will be published in March.

Anthropology

102 Introduction to Anthropology: Social-Cultural Perspectives on Mankind

Archaeology

263 Introduction to Biblical History and Archaeology

Architecture

125 Introduction to Architecture
Consult the Department of Architecture office for a complete list of summer design offerings.

Art

121 Introductory Painting
123 Landscape Painting
132 Introductory Graphics
141 Introductory Sculpture
151 Introductory Drawing
158 Conceptual Drawing
159 Life and Still-Life Drawing
161 Introductory Photography I
168 Black-and-White Photography
169 Color Photography
261 Photography II
361 Photography III
379 Independent Studio

Astronomy

105 An Introduction to the Universe
106 Essential Ideas in Relativity and Cosmology

Biological Sciences

100 General Biology
205 Biomedical Ethics
211 Basic Histology Techniques for Light Microscopy
245 Plant Biology
261 General Ecology
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<th>Course Code</th>
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<td>Introductory Macroeconomics</td>
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<td>Principles of Accounting</td>
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<td>Managerial Accounting for Planning and Control</td>
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<td>Intermediate Microeconomic Theory</td>
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<td>Intermediate Macroeconomic Theory</td>
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<td>Government</td>
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<td>Power and Society in America</td>
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<td>History</td>
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<td>151</td>
<td>Introduction to Western Civilization</td>
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<tr>
<td>363</td>
<td>Russian History since 1800</td>
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</table>
History of Art
102 Writing about Art
202 Survey of European Art: Renaissance to Modern
261 Introduction to Art History: Modern Art

Hotel Administration
161 Keyboarding for Managers on the Macintosh
486 Historical Introduction to Public Hospitality Law and Its Impact on American Society

Human Development and Family Studies
115 Human Development: Infancy and Childhood
150 Families in Modern Society
216 Adolescence and Youth: Biological and Cognitive Development
217 Adolescence and Youth: Personality and Social Development

Human Service Studies
315 Human Sexuality: A Biosocial Perspective

Industrial and Labor Relations
Collective Bargaining
200/500 Collective Bargaining
201/501 Labor Relations Law and Legislation
Economic and Social Statistics
510 Introductory Statistics for the Social Sciences
Labor Economics
240 Economics of Wages and Employment
540 Labor Economics
Organizational Behavior
121 Introduction to Microorganizational Behavior and Analysis
222 Studies in Organizational Behavior
371 Individual Differences and Organizational Behavior
520 Micro Organizational Behavior and Analysis
Personnel and Human Resource Studies
260/560 Personnel Management
361 Managing Human Resources
662 Managing an Organization through Simulation Training
669 Special Topics

Interdepartmental
150 Labor Problems in American Society

Marine Science
Consult the Shoals Marine Laboratory office for a complete list of summer offerings in marine science.

Mathematics
101 History of Mathematics
107 Finite Mathematics
109 Precalculus Mathematics
111–112 Calculus
123 Analytic Geometry and Calculus
192 Calculus for Engineers
213 Calculus
231 Linear Algebra
294 Engineering Mathematics
305 Mathematics in the Real World
336 Applicable Algebra
372 Elementary Statistics
421–422 Applicable Mathematics
451 Classical Geometries
486 Applied Logic
508 Mathematics for Secondary School Teachers

Mechanical and Aerospace Engineering
302 Technology, Society, and the Human Condition

Medieval Studies
102 King Arthur and His Knights

Microbiology
290–291 General Microbiology

Modern Languages and Linguistics
Chinese
160 Introductory Intensive Chinese (Mandarin)
201–202 Intermediate Chinese
Dutch
131–132 Dutch Elementary Reading Course
English
101–102 English as a Second Language
211 English as a Second Language
215 English for Later Bilinguals
French
101 French Basic Course I
123 Continuing French
203 Intermediate Composition and Conversation
German
121–122 Elementary German
123 Continuing German
203 Intermediate Composition and Conversation
631–632 German Elementary Reading Course

Italian
101 Italian Basic Course I

Japanese
160 Introductory Intensive Japanese
403 Teaching of Japanese as a Foreign Language

Linguistics
101 Introduction to the Scientific Study of Language

Russian
123 Continuing Russian

Spanish
101 Spanish Basic Course I
123 Continuing Spanish

Music
101 The Art of Music
105 Introduction to Music Theory
331 Summer Session Choir

Natural Resources
215 Environment Disruption and Regulation
216 Issues in Water Quality
230 Diet for a Small Planet

Near Eastern Studies
103 Elementary Hebrew
104 Continuing Hebrew
263 Introduction to Biblical History and Archaeology
399 Modern History of the Middle East

Nutritional Sciences
415 Field-based Learning in Nutrition

Operations Research and Industrial Engineering
260 Introductory Engineering Probability
270 Basic Engineering Probability and Statistics
622 Operations Research I

Philosophy
101 Introduction to Philosophy
103 Reasoning and Writing
131 Logic: Evidence and Argument
145 Contemporary Moral Issues
231 Introduction to Formal Logic
245 Biomedical Ethics
### Physical Education
Consult the Physical Education office for a complete list of summer offerings for credit and recreation.

### Physics
- **101-102** General Physics
- **112** Physics I: Mechanics and Heat
- **213** Physics II: Electricity and Magnetism
- **214** Physics III: Optics, Waves, and Particles
- **400** Informal Advanced Laboratory
- **500** Informal Graduate Laboratory
- **510** Advanced Experimental Physics
- **520** Projects in Experimental Physics

### Psychology
- **101** Introduction to Psychology: The Frontiers of Psychological Inquiry
- **124** Introduction to Psychology: Brain and Behavior—Normal and Abnormal
- **128** Introduction to Psychology: Personality and Social Behavior
- **195** Art and Psychology
- **214** Introduction to Cognitive Psychology
- **215** Language and Communication
- **280** Introduction to Social Psychology
- **281** Interpersonal Relations and Small-Group Processes
- **282** Psychology of Stereotyping and Prejudice
- **325** Introductory Psychopathology
- **350** Statistics and Research Design
- **401** Current Topics in Psychopathology and Personality
- **469** Psychotherapy: Its Nature and Influence

### Theatre Arts
- **108** Writing about Film
- **284** Voice and Pronunciation Skills
- **287** Summer Acting Workshop
- **374** Introduction to Film Analysis: Meaning and Value
- **377** Fundamentals of 16-mm Filmmaking
- **474** Advanced Film Projects
- **475** Seminar in the Cinema

### Theoretical and Applied Mathematics
- **202** Mechanics of Solids
- **203** Dynamics

### Sociology
- **101** Introduction to Sociology
- **102** Hard Choices
- **221** Sociology of Organizations
- **252** Public Opinion
- **364** Race and Ethnicity
- **280** Introduction to Social Psychology
- **281** Interpersonal Relations and Small-Group Processes
- **347** Aging: Issues in the 1980s

### Women's Studies
- **110** Introduction to Women's Studies
- **351** Higher Education for Women

### Spanish Literature
- **201** Introduction to Hispanic Literature
New York State College of Veterinary Medicine

Administration

Robert D. Phemister, dean
S. Gordon Campbell, associate dean for academic affairs
Neil L. Norcross, secretary of the college
John A. Lambert, assistant dean for administration
John C. Semmler, assistant dean for external programs and research administration
Marcia J. Sawyer, director of student affairs and admissions
Gloria S. Crissey, registrar, student affairs and admissions

Department Chairmen

Anatomy: A. deLahunta
Avian and Aquatic Animal Medicine: B. Calnek
Clinical Sciences: to be named
Microbiology: S. G. Campbell (acting)
Pathology: L. Krock (acting)
Pharmacology: G. Sharp
Physiology: R. Wasserman

The College

The College of Veterinary Medicine offers a professional program that requires four years of full-time academic and clinical study of the normal and abnormal structure and function of the animal body and the diagnosis, treatment, and prevention of animal disease. Graduates of the college receive the Doctor of Veterinary Medicine (D.V.M.) degree, which is recognized by licensing boards throughout the world. Graduates generally enter private practice or become engaged in one of the increasing number of other biomedical activities.

Admission requires a minimum of three years of college work, including specific prerequisite courses and experience. Applications must be filed approximately one year before the proposed matriculation date. The competition for admission is keen, since there are many more qualified applicants than can be admitted. Graduate programs in veterinary research and postdoctoral training in clinical specialties are open to Doctors of Veterinary Medicine and some highly qualified holders of baccalaureate degrees and lead to the degree of Master of Science, or Doctor of Philosophy.

More detailed information is contained in the Announcement of the New York State College of Veterinary Medicine, which may be obtained by writing to the college.

Note: 500- and 600-level courses are open only to veterinary students except by written permission from the instructor.

Anatomy

500 Gross Anatomy: Small Animal First year.
501 Gross Anatomy: Large Animal First year.
502 Microscopic Anatomy First year.
504 Neuroanatomy and Clinical Neurology First year.

Clinical Sciences

475 Health and Diseases of Animals Spring.
520 Preventive Medicine in Animal Health Management Spring.
531 Regulatory Medicine Spring.
540 Pathology Service Fall and spring.
545 Clinical Epidemiology Fall.
547 Practice Management Fall and spring.
548 Anesthesiology Fall.
561 Theriogenology I Spring.
562 Theriogenology II Fall.
563 Large Animal Medicine and Surgery Fall.
564 Large Animal Medicine and Surgery Spring.
566 Radiographic Techniques Fall.
567 Clinical Nutrition Fall.
568 Foundations of Clinical Science I Fall.
569 Foundations of Clinical Science II Spring.
570 Theriogenology Service Spring.
572 Senior Seminar Fall and spring.
574 Large Animal Surgery Service Fall and spring.
575 Ambulatory Service Fall and spring.
577 Anesthesiology Service Fall and spring.
579 General Medicine and Surgery Spring.
580 Radiology Service Fall and spring.
581 Animal Nutrition Fall.
582 Large Animal Surgical Exercises Spring.
583 Small Animal Medicine and Surgery Fall.
584 Small Animal Medicine and Surgery Spring.
586 Special Problems in Small Animal Surgery Spring.
589 Small Animal Medicine Service Fall and spring.
591 Small Animal Surgery Service Fall and spring.
593 Ophthalmology Service Fall and spring.
594 Large Animal Medicine Service Fall and spring.
596 Opportunities in Veterinary Medicine Fall and spring.
598 Dermatology Service Fall and spring.
611 Mastitis January.
616 Research Opportunities in Veterinary Medicine Fall, January, spring, and summer.
644 Introduction to Epidemiology Spring.
675 Special Problems in Large Animal Medicine Fall and spring.
676 Special Problems in Large Animal Surgery Fall and spring.
677 Special Problems in Large Animal Obstetrics Fall and spring.
678 Fundamental Techniques in Embryo Transfer Fall.
680 Poisonous Plants Fall.
681 Horse Health Management Spring.
684 Horse Lameness Spring.
687 Diseases of Swine Spring.
688 Special Problems in Small Animal Medicine Fall and spring.
689 Special Problems in Small Animal Surgery Fall and spring.
690 Veterinary Dermatology Spring.
691 Advanced Large Animal Internal Medicine Problems Spring.
766 Graduate Research Fall, spring, and summer.
768 Master's-Level Thesis Research Fall and spring.
769 Doctoral-Level Thesis Research Fall and spring.
782 Special Topics in Comparative Ophthalmology Fall.
799 Independent Studies in Epidemiology Fall and spring.

Microbiology
315 Basic Immunology Lectures (also Biological Sciences 305) Fall.
316 Basic Immunology Laboratory (also Biological Sciences 307) Fall.
317 Pathogenic Microbiology Spring.
335 Wildlife Parasitology Spring.
510 Veterinary Parasitology Fall.
515 Veterinary Immunology Fall.
516 Infectious Diseases I Fall.
517 Infectious Diseases II Fall.
518 Infectious Diseases III Spring.
519 Introductory Microbiology Spring.
605 Special Projects in Microbiology Fall and spring.
606 Small Animal Infectious Diseases Spring.
607 Virus Diseases of Cattle Fall.
615 Research Opportunities in Veterinary Medicine Fall, January, spring, and summer.
706 Immunology Seminar Series Fall and spring.
707 Advanced Work in Bacteriology, Virology, Immunology Fall and spring.
708 Animal Virology Spring.
709 Laboratory Methods of Diagnosis Fall and spring.
710 Microbiology Seminars Fall and spring.
713 Special Projects in Immunology: Monoclonal Antibodies Spring.
714 Special Projects in Immunology: Immunodeficiency Spring.
715 Special Projects in Immunology: Macrophage Function Spring.
737 Advanced Work in Parasitology Fall and spring.
783 Seminars in Parasitology Fall and spring.

Pharmacology
528 Pharmacology I Fall.
529 Pharmacology II Spring.
610 Research Opportunities in Veterinary Medicine Fall, January, spring, and summer.
620 Advanced Clinical Pharmacology Spring.
621 Toxicology (also Toxicology 621) Spring.
622 Special Projects in Pharmacology Fall, spring, and summer.
701 Receptors and Ion Channels Spring.
704 Electrophysiological Methods in Pharmacology Spring.

Pathology
535 Veterinary Pathology I Fall.
536 Veterinary Pathology II Spring.
539 Introduction to Laboratory Animal Medicine Spring.
540 Pathology Service Fall and spring.
571 Clinical Pathology Spring.
613 Research Opportunities in Veterinary Medicine Fall, January, spring, and summer.
635 Special Problems in Pathology Fall and spring.
636 Wildlife Pathology Fall.
637 Postmortem Pathology Fall and spring.
639 Autotutorial Course in Laboratory Animal Medicine and Science Fall and spring.
641 Clinical Immunology Spring.
736 Pathology of Nutritional Diseases Spring.
739 Advanced Work in Pathology Fall and spring.
749 Laboratory Animal Clinical Rotation Fall and spring.
788 Seminar in Surgical Pathology Fall and spring.
789 Seminar in Necropsy Pathology Fall and spring.
790 Special Topics in Pathology Fall.
793 Lectures in General Pathology Fall.
794 Lectures in Special Pathology Spring.
795 The Vertebrates (Biological Sciences 214 and Women's Studies 214) Fall, spring, and summer.
796 Histology: The Biology of the Tissues (Biological Sciences 313) Fall.
797 Cellular Physiology (Biological Sciences 316) Spring.
798 Cellular Physiology (Biological Sciences 316) Spring.

Physiology
535 Veterinary Physiology I Fall.
536 Veterinary Physiology II Spring.
539 Introduction to Laboratory Animal Medicine Spring.
540 Pathology Service Fall and spring.
571 Clinical Pathology Spring.
613 Research Opportunities in Veterinary Medicine Fall, January, spring, and summer.
635 Special Problems in Pathology Fall and spring.
636 Wildlife Pathology Fall.
637 Postmortem Pathology Fall and spring.
639 Autotutorial Course in Laboratory Animal Medicine and Science Fall and spring.
641 Clinical Immunology Spring.
736 Pathology of Nutritional Diseases Spring.
739 Advanced Work in Pathology Fall and spring.
749 Laboratory Animal Clinical Rotation Fall and spring.
788 Seminar in Surgical Pathology Fall and spring.
789 Seminar in Necropsy Pathology Fall and spring.
790 Special Topics in Pathology Fall.
793 Lectures in General Pathology Fall.
794 Lectures in Special Pathology Spring.
795 The Vertebrates (Biological Sciences 214 and Women's Studies 214) Fall, spring, and summer.
796 Histology: The Biology of the Tissues (Biological Sciences 313) Fall.
797 Cellular Physiology (Biological Sciences 316) Spring.
798 Cellular Physiology (Biological Sciences 316) Spring.
759 Nutrition and Physiology of Mineral Elements (also Biological Sciences 615 and 659) Fall.
Fundamentals of Endocrinology, Lecture (Animal Science 427) Fall.
Fundamentals of Endocrinology, Laboratory (Animal Science 428) Fall.

Faculty Roster

Antczak, Douglas F., Ph.D., U. of Cambridge (England) Assoc. Prof., Microbiology
Riis, Ronald C., D.V.M., U. of Minnesota. Assoc. Prof.,
Clinical Sciences
Sack, Wolfgang O., Ph.D., U. of Edinburgh (Scotland).
Prof., Anatomy
Prof., Clinical Sciences
Schat, Karel A., Ph.D., Cornell U. Assoc. Prof., Avian
and Aquatic Animal Medicine
Schafer, Donald H., Ph.D., U. of Georgia. Asst. Prof.,
Pathology
Prof., Clinical Sciences
Schwarz, Wayne S., Ph.D., U. of Ottawa (Canada).
Assoc. Prof., Pharmacology
Scott, Danny W., D.V.M., U. of California at Davis.
Assoc. Prof., Clinical Sciences
Scott, Frederic W., Ph.D., Cornell U. Prof., Microbiology
Sears, Philip M., Ph.D., Ohio State U. Assoc. Prof.,
Diagnostic Laboratory
Prof., Pharmacology
Shivaprasad, Hulimangala, Ph.D., Ohio State U., Avian
and Aquatic Animal Medicine
Short, Charles E., D.V.M., Auburn U. Prof., Clinical
Sciences
Stauson, David O., Ph.D., U. of California at Davis.
Assoc. Prof., Pathology
Smith, Mary C., D.V.M., Cornell U. Assoc. Prof., Clinical
Sciences
Straw, Barbara E., Ph.D., U. of Minnesota. Assoc. Prof.,
Diagnostic Laboratory
Summers, Brian A., Ph.D., Cornell U. Assoc. Prof.,
Pathology
Tapper, Daniel N., Ph.D., Cornell U. Prof., Physiology/
(Section of Physiology)
Tennant, Bud C., D.V.M., U. of California at Davis. Prof.,
Clinical Sciences
Thompson, John C., Jr., Ph.D., Cornell U. Assoc. Prof.,
Clinical Sciences
Timoney, John F, Ph.D., National U. of Ireland. Prof.,
Microbiology
Torres, Alfonso, Ph.D., U. of Nebraska. Assoc. Prof.,
Diagnostic Laboratory
Sciences
Wasserman, Robert H., Ph.D., Cornell U. Prof.,
Physiology/(Section of Physiology)
Weiland, Gregory A., Ph.D., U. of California at San
Diego. Asst. Prof., Pharmacology
White, Maurico E., D.V.M., Cornell U. Assoc. Prof.,
Clinical Sciences
Winter, Alexander J., Ph.D., U. of Wisconsin. Prof.,
Clinical Sciences
Woods, Gordon L., Ph.D., U. of Wisconsin. Asst. Prof.,
Clinical Sciences
Woolston, John F, Ph.D., Cornell U. Prof., Physiology
Zimmer, James F, Ph.D., Cornell U. Asst. Prof., Clinical
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